



## CLEARING PERMIT

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

<b>Purpose Permit number:</b>	CPS 9293/1
<b>Permit Holder:</b>	Shire of Augusta-Margaret River
<b>Duration of Permit:</b>	From 14 September 2021 to 14 September 2036

The permit holder is authorised to clear native vegetation subject to the following conditions of this permit.

### **PART I – CLEARING AUTHORISED**

**1. Clearing authorised (purpose)**

The permit holder is authorised to clear native vegetation for the purpose of drainage works.

**2. Land on which clearing is to be done**

Lot 568 on Plan 400255 (Reserve 51577), Margaret River

**3. Clearing authorised**

The permit holder must not clear more than 0.256 hectares of native vegetation within the area cross-hatched yellow in Figure 1 of Schedule 1.

**4. Period within which clearing is authorised**

The permit holder must not clear any native vegetation after 14 September 2026.

### **PART II – MANAGEMENT CONDITIONS**

**5. 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.

## 6. 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.

## 7. Directional clearing

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

## 8. Fauna management – western ringtail possums and south- western brush-tailed phascogales

- (a) In relation to the area cross-hatched yellow in Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect that area immediately prior to, and for the duration of clearing activities, for the presence of western ringtail possum(s) (*Pseudocheirus occidentalis*) and southwestern brush-tailed phascogales (*Phascogale tapoatafa*)
- (b) Clearing activities must cease in any area where fauna referred to in condition 8(a) are identified until either:
  - (i) the western ringtail possum/southwestern brush-tailed phascogale individual(s) has/have moved on from that area to adjoining suitable habitat; or
  - (ii) the western ringtail possum/southwestern brush-tailed phascogale individual(s) has/have been removed by a *fauna specialist*
- (c) Any western ringtail possum/southwestern brush-tailed phascogale individual(s) removed in accordance with condition 8(b)(ii) must be relocated by a *fauna specialist* to a *suitable habitat* within the area cross-hatched red in Figure 2 of Schedule 1, or as otherwise approved by the *CEO*.
- (d) Where fauna is identified under condition 8(a), the permit holder must within 14 calendar days provide the following records to the *CEO*:
  - (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 *fauna 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.

**9. Fauna management – black cockatoo habitat**

- (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 *black cockatoo habitat tree/s* being utilised by *black cockatoo species* listed below:
  - (i) *Calyptorhynchus lateriosis* (Carnaby’s cockatoo);
  - (ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo); and
  - (iii) *Calyptorhynchus baudinii* (Baudin’s cockatoo).
- (b) Where *black cockatoo habitat tree/s* are identified under condition 9(a), the permit holder must engage a *fauna specialist* to map *black cockatoo habitat tree/s* within the permit area.
- (c) Each *black cockatoo habitat tree* identified must be inspected by a *fauna specialist* for *evidence* of current or past breeding use by *black cockatoo species*.
- (d) Where a *black cockatoo habitat tree* with no *evidence* of current or past use by *black cockatoo species* is identified in accordance with condition 9(a), that tree must only be cleared immediately after the inspection.
- (e) Where a *black cockatoo 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 *black cockatoo species* under condition 9(c), 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 *black cockatoo breeding tree* with *evidence* of current breeding use by *black cockatoo species* must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under condition 9(e).
- (g) For each *black cockatoo breeding 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 9(g) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *black cockatoo breeding tree(s)*.
- (i) The artificial black cockatoo nest hollow(s) required by condition 9(g) of this permit must:
  - (i) be installed within the area cross-hatched red on Figure 2 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 *black cockatoo 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 9(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 *black cockatoo habitat tree/s* identified show current or past use by black cockatoo species;
  - (v) the methodology, used to survey the permit area;
  - (vi) a photo of the *black cockatoo habitat tree(s)* identified; and
  - (vii) a description of the *black cockatoo habitat tree(s)* identified, including the:
    - (A) species of *black cockatoo habitat tree(s)*; and
    - (B) condition of the *black cockatoo habitat tree(s)*.

#### **10. Revegetation - mitigation**

- (a) The Permit Holder must, within 12 months of the commencement of clearing authorised under this Permit:
  - (i) undertake deliberate *planting* of at least 26 trees within the area crosshatched red in Figure 1 of Schedule 1,
  - (ii) the revegetation area shall include a combination of *Agonis flexuosa*, *Corymbia calophylla*, *Eucalyptus diversicolor* and *Melaleuca raphiophylla*
  - (iii) ensure only local provenance propagating material is used for *planting* activities;
  - (iv) ensure *planting* is undertaken at the optimal time;
  - (v) undertake weed control and watering of seedlings for at least three years post *planting*.
- (b) The Permit Holder must, within 24 months of *planting* the trees in accordance with condition 10(a)(i) of this Permit:
  - (i) engage an environmental specialist to make a determination that the planted trees will survive;
  - (ii) if the determination made by the environmental specialist under condition 10(b)(i) is that all planted trees will not survive, the Permit Holder must plant additional trees that will result in 26 trees persisting within the area crosshatched red in Figure 1 of Schedule 1,

## **PART III - RECORD KEEPING AND REPORTING**

### **11. 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"> <li>(a) the species composition, structure, and density of the cleared area;</li> <li>(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;</li> <li>(c) the date that the area was cleared;</li> <li>(d) the size of the area cleared (in hectares); and</li> <li>(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; and</li> <li>(f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 6.</li> <li>(g) actions taken in accordance with condition 7.</li> <li>(h) actions taken to manage and mitigate impacts to western ringtail possums and south-western brush-tailed phascogales in accordance with condition 8.</li> <li>(i) actions taken to revegetate in accordance with condition 10.</li> </ul>
2.	In relation to black cockatoo fauna management pursuant to conditions 9	<ul style="list-style-type: none"> <li>(a) the time(s) and date(s) of inspection(s) of the suitable <i>black cockatoo habitat tree</i> by the <i>fauna specialist</i>;</li> <li>(b) a description of the inspection methodology employed by the <i>fauna specialist</i>;</li> <li>(c) the species name of any fauna determined by the <i>fauna specialist</i> to be occupying the suitable <i>black cockatoo habitat tree</i>;</li> <li>(d) where the suitable <i>black cockatoo habitat tree</i> is determined by the <i>fauna specialist</i> to be occupied by <i>black cockatoo species</i>: <ul style="list-style-type: none"> <li>(i) the time and date that it was determined to be no longer occupied; and</li> <li>(ii) a description of the evidence by which it was determined to be no longer occupied;</li> </ul> </li> </ul>

No.	Relevant matter	Specifications
		and (e) the time and date that the suitable <i>black cockatoo habitat tree</i> was cleared.

## 12. Reporting

- (a) The permit holder must provide to the *CEO*, on or before 30 June of each calendar year, a written report containing:
- (i) the records required to be kept under condition 11; and
  - (ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.
- (b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been undertaken, must be provided to the *CEO* on or before 30 June of each calendar year.
- (c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of the permit, a written report of records required under condition 11, where these records have not already been provided under condition 12(a).

## DEFINITIONS

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

**Table 2: Definitions**

Term	Definition
black cockatoo habitat trees	means trees that have a diameter, measured at 130 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.
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.
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)
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.

<b>Term</b>	<b>Definition</b>
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> .
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species
suitable habitat	<p>means habitat known to support western ringtail possums (<i>Pseudocheirus occidentalis</i>) and southwestern brush-tailed phascogale (<i>Phascogale tapoatafa</i>) within the known current distribution of these species.</p> <p>Suitable habitat for western ringtail possums is typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy 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.</p> <p>Suitable habitat for southwestern brush-tailed phascogale is typically characterised by dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.</p>
weeds	<p>means any plant –</p> <ul style="list-style-type: none"> <li>(a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or</li> <li>(b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or</li> <li>(c) not indigenous to the area concerned.</li> </ul>

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**END OF CONDITIONS**




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**Meenu Vitarana**  
**A/MANAGER**  
**NATIVE VEGETATION REGULATION**

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

20 August 2021

# SCHEDULE 1

The boundary of the area authorised to be cleared is shown in hatched yellow and the boundary of the area within which planting is to occur is shown in hatched red the map below (Figure 1).



**Figure 1: Map of the boundary of the area within which clearing may occur and where conditions apply**



The boundary of the area within which fauna management (relocation and artificial hollows) is to occur is shown in hatched red in the map below (Figure 2).

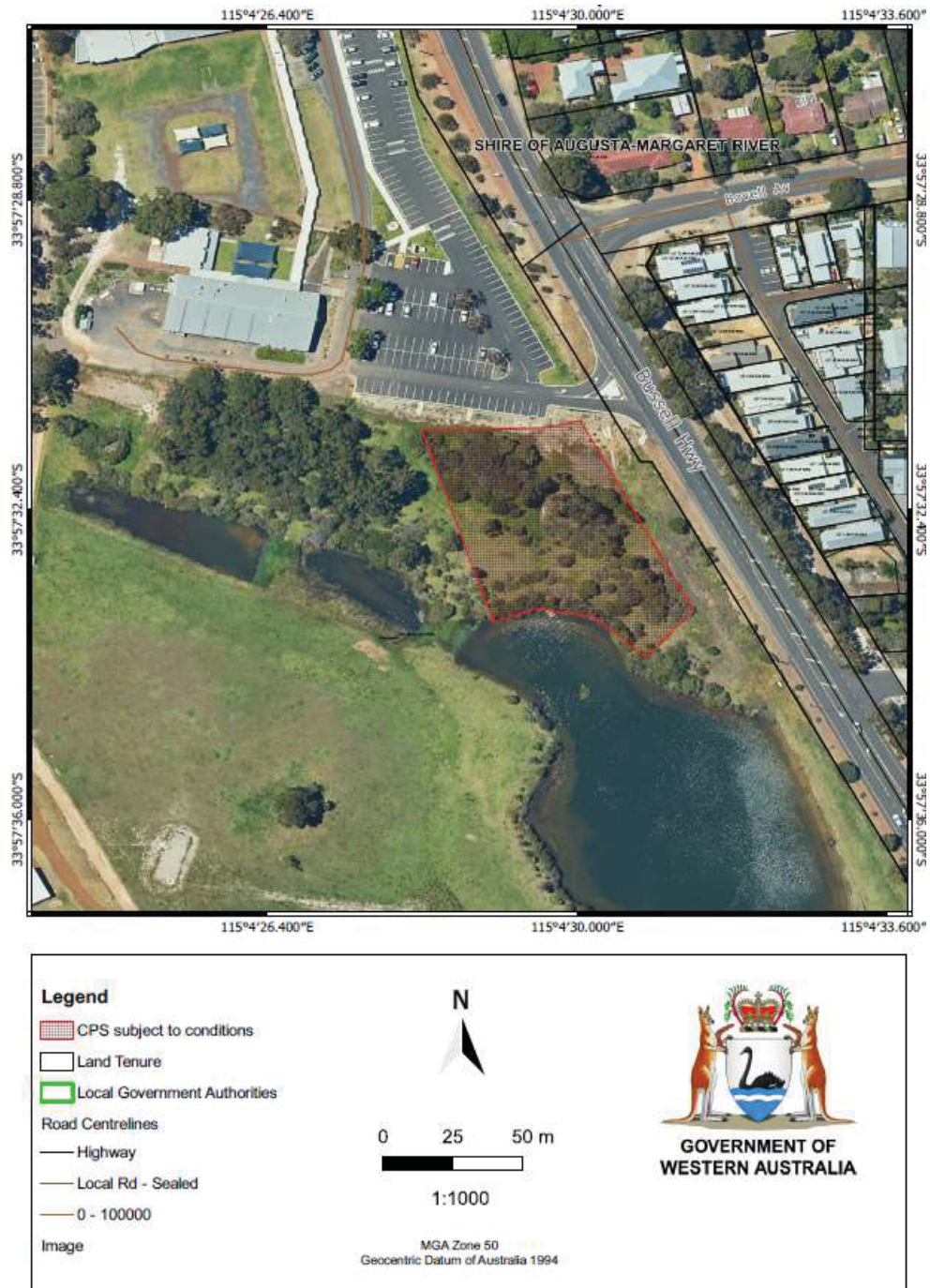


Figure 2: Map of the boundary of the area within which conditions apply

## **Schedule 2**

### **How to design and place 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.

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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**

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### **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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## **Schedule 3**

### **How to monitor and maintain 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](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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**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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# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

<b>Permit number:</b>	CPS 9293/1
<b>Permit type:</b>	Purpose permit
<b>Applicant name:</b>	Shire of August Margaret River
<b>Application received:</b>	18 May 2021
<b>Application area:</b>	0.256 hectares of native vegetation
<b>Purpose of clearing:</b>	Drainage works
<b>Method of clearing:</b>	Mechanical
<b>Property:</b>	Lot 568 on Plan 400255 (Reserve 51577)
<b>Location (LGA area/s):</b>	Shire of Augusta Margaret River
<b>Localities (suburb/s):</b>	Margaret River

### 1.2. Description of clearing activities

The vegetation proposed to be cleared is two portions within a single contiguous area (see Figure 1, Section 1.5). The application is to increase the size of an existing bund within a drainage basin and connect new drainage pipes associated with the construction of an oval.

### 1.3. Decision on application

<b>Decision:</b>	Granted
<b>Decision date:</b>	20 August 2021
<b>Decision area:</b>	0.256 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 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the works are in support of the adjacent school sports oval at Margaret River High school as part of the South West Recovery Plan (Government of Western Australia, 2020).

The assessment identified that the proposed clearing would result in:

- The loss of native vegetation which may be suitable habitat or linkage for *Pseudocheirus occidentalis* (western ringtail possum).

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values
- potential land degradation in the form of wind erosion, and
- short term impacts to the water quality within the watercourse.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on fauna species, or the conservation status of fauna species and that water quality and land degradation impacts are temporary and unlikely lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures.

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

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- implement fauna management measures prior to, and for the duration of clearing, and
- undertake revegetation consisting of the planting of native trees of suitable species within a nearby area to provide improved future habitat for black cockatoo species and western ringtail possums, including canopy connectivity.

### 1.5. Site map



Figure 1 The area crosshatched yellow indicates(s) the area(s) authorised to be cleared under the granted clearing permit. The area cross-hatched red indicates areas within which specific conditions apply (tree planting).

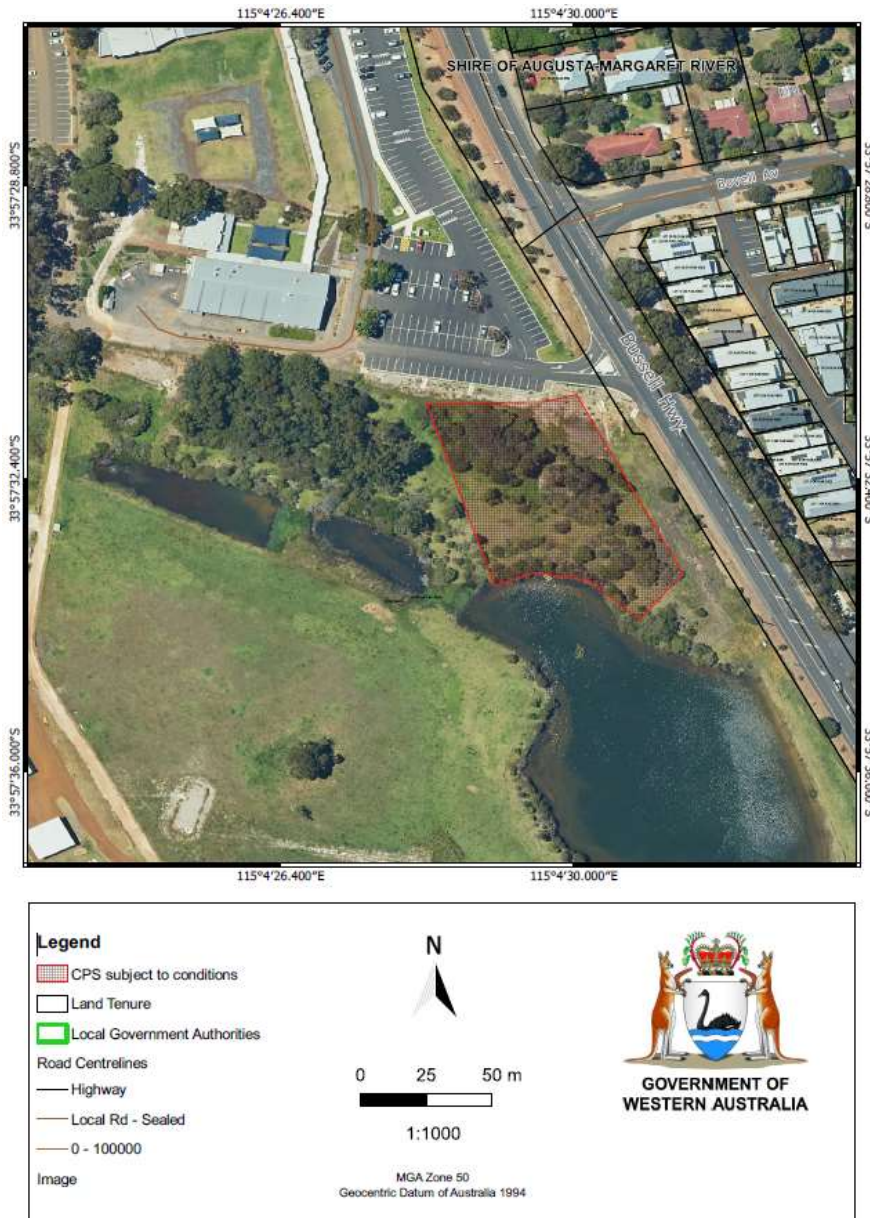


Figure 2 The area cross-hatched red indicates areas within which specific conditions apply for fauna management (western ringtail possums, phascogales and black cockatoos).

## 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 polluter pays principle, and
- 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), and
- *Planning and Development Act 2005* (WA) (P&D Act).

The key guidance documents which inform this assessment are:

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

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

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

Evidence was submitted by the applicant, demonstrating that the proposed clearing is for the minimum amount required to construct the drainage bund and the pipework. The application has included an additional marginal amount to allow for the consequential back-flooding from the higher bund and has been included in the footprint. The applicant has committed to implementing the following mitigation measures:

- “Undertake no earthworks in the drainage basin floor to allow opportunities for waterlogging tolerant vegetation to remain;
- Best practice weed and dieback hygiene measures will be implemented during clearing and construction ...
- Clearing will be implemented in strict accordance with DBCA’s Procedures to Minimise the Risk to Western Ringtail Possums during Vegetation Clearing and Building Demolition ..., including the presence of a fauna spotter and handler on site prior to and during construction in order to inspect trees and manage and disturbed animals” (Shire of Augusta Margaret River, 2021).

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 B) 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 C) identified that the impacts of the proposed clearing present a risk to biological values (fauna), significant remnant vegetation, and land and water resources. 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 - Clearing Principles (a), (b) and (c)**

###### Assessment

According to available databases, there are 20 species of conservation significant flora within the local area (10-kilometre radius). Some of these species are known to have habitat preferences of winter wet areas or areas that become inundated. It is considered that while the proposed clearing area does provide this habitat type, the density of weeds and grasses within the understory is inconducive to supporting these species. Therefore, the application area does not support habitat for Priority or Threatened flora species.

Of the 44 conservation significant fauna species recorded within the local area ten are known to be marine or freshwater species, and therefore the application area does not present suitable habitat. Five species recorded within the local area are known to be locally extinct and one completely extinct.

Twenty fauna species were considered as having a low likelihood to occur within the application area based on their known habitat preferences and the habitat within the area applied to clear. One species was considered to have a medium likelihood to be found within the application area: *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale). Four species were considered highly likely to occur within the application area based on the habitat available and their known habitat preferences. This included *Calyptorhynchus baudinii* (Baudin’s cockatoo), *Calyptorhynchus latirostris* (Carnaby’s cockatoo), *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo), and *Pseudocheirus occidentalis* (western ringtail possum). Considering the presence of a dense understory, two ground-dwelling species are also considered likely to occur within the application area, the water rat and the quenda.

Photographs provided by the applicant (Appendix E) show some trees present within the application area and comments provided by the applicant (see Table 1 below) note that only one tree will be removed to raise the bund wall and install drainage with other trees considered likely to be impacted by flooding. The photographs are



inconclusive to the absence or presence of hollows within the trees to be cleared. Historical imagery (Appendix E) shows some of the trees within the application area may be over 20 years old but much of the vegetation has regrown or been planted.

The applicant provided the following information on the species impacted:

Species	DBH	Cause of Impact
Karri	0.9	flood
Marri	0.8	flood
Marri	0.6	flood
Karri	0.6	flood
Peppermint	0.3	flood
Peppermint	0.6	flood
Melaleuca	0.6	flood
Peppermint	0.5	flood
Marri	0.8	flood
Marri	0.5	flood
Peppermint	0.5	flood
<b>Karri</b>	<b>0.5</b>	<b>bund</b>
Karri	0.8	flood

Table 1: The species of trees likely to be directly (bund) and indirectly (flood) impacted by the proposed clearing (Shire of Augusta-Margaret River, 2021)

#### Black cockatoos

Carnaby's cockatoo, Baudin's cockatoo and forest red-tail black cockatoo (collectively known as black cockatoos) nest in hollows in live or dead trees of karri, marri, wandoo, tuart, salmon gum, jarrah, flooded gum, York gum, powder bark, bullich and blackbutt (Commonwealth of Australia, 2012). Breeding habitat or a 'habitat tree' is defined in the EPBC Act referral guidelines as 'trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow' (Commonwealth of Australia, 2012). The application area is within the known breeding range of Baudin's and Carnaby's black cockatoo and the 'core' range of forest red-tail black cockatoo, and therefore, is within the known range for all three black cockatoo species. A review of the available databases indicated the application area is within 12 kilometres of 17 mapped black cockatoo roosting sites. The local area does not contain any mapped black cockatoo breeding sites but does contain 699 previous records of black cockatoo species, the closest located 236 metres away.

The trees within the application area have not been surveyed for hollows but are of suitable size to form hollows. The photographs of trees provided by the applicant do not show any hollows. A fauna management condition applied to the permit to inspect the trees for hollows prior to clearing will mitigate potential impacts to black cockatoo breeding habitat.

Given the proximity to water sources such as the dams, watercourses and other tributaries, the trees within the application area may offer potential roosting habitat. However, the proposed clearing will not remove all large trees within the development proposal, ensuring black cockatoos still have roosting opportunities in the immediate vicinity of the application area.

The referral guidelines indicate while breeding, black cockatoos will generally forage within a 6–12-kilometre radius of their nesting site. Following breeding, black cockatoos assemble into flocks and move through the landscape searching for food, usually foraging within 6 kilometre of a night roost (Commonwealth of Australia, 2012). This variable range indicates large areas of foraging habitat are required to support black cockatoo populations. Cumulative impacts of the loss of remnant vegetation restrict the availability of food sources for black cockatoos (Commonwealth of Australia, 2012).

Carnaby's cockatoos have preference for feeding habitat that includes jarrah and marri woodlands and forest heathland and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp. And *Grevillea* sp., also insects and insect larvae; pith of kangaroo paw (*Anigozanthos flavidus*); juice of ripe persimmons; tips of *Pinus* spp. and seeds of apples and pears (Commonwealth of Australia, 2012). Forest red-tailed black cockatoo's have

preference for seeds of jarrah and marri in woodlands and forest, and edges of karri forests, including wandoo and blackbutt, *Eucalyptus caesia*, *E. erythrocorys*, *Allocasuarina* cones, fruits of snottygobble (*Persoonia longifolia*) and mountain marri (*Corymbia haematoxylon*), and some introduced eucalypts such as river red gum (*E. camaldulensis*) and flooded or rose gum (*E. grandis*). Baudin's cockatoo prefer native shrubland, kwongan heathland and woodland on seeds, flowers and nectar of native proteaceous plant species (*Banksia* spp., *Hakea* spp., *Dryandra* spp., and *Grevillea* spp.), as well as *Callistemon* spp. and marri. Also seeds of introduced species including *Pinus* spp., *Erodium* spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.

The application area proposes to remove a total of 0.256 hectares which is expected to contain a very minimal of foraging habitat, as only one karri tree is to be directly impacted by the construction of the bund. The other trees which are likely to be impacted by back flooding are of some foraging value to species though this is not considered to be significant given the amount of foraging habitat remaining within the local area.

Noting the above and the presence of approximately 46 per cent coverage of remnant vegetation in the local area, DWER considers that abundant foraging resources will be available within the local area.

The Delegated Officer determined the application is not likely to remove significant foraging or roosting habitat for any of the black cockatoo species in Western Australia. Consideration of breeding habitat has been addressed within clearing permit conditions.

### **Western Ringtail Possum (WRP)**

The 'Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan' outlines strategies to slow the decline in population size, extent, and area of occupancy through managing major threatening processes affecting the subpopulations and their habitats and allowing the persistence of the species in each of the identified key management zones: Swan Coastal Plain, southern forests and south coast (DPaW, 2017). The application area is located within the Southern Forest Management Zone.

Within this management zone, populations are associated with a diverse range of habitats including coastal heath, jarrah/marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest.

Noting the habitat preferences of this species, the mapped vegetation type within the application area, the presence of waterbodies, a large conservation area close by and local records of the species, it is considered that western ringtail possum may occur within the application area.

Noting the quantity of vegetation within the local area, the Delegated Officer determined that the application area does not represent significant habitat for the species, and the removal of one tree and indirect impacts (from flooding) to the other trees within the application area would not significantly impact on habitat connectivity for the species (particularly noting the proposed revegetation in the vicinity of the application area to provide better linkage values in the local area). The proposed clearing is however likely to impact on individuals transient through the area, which have been addressed through permit conditions.

### **South-Western Brush-Tailed Phascogale**

In south-west WA, this species is known to occur in open woodlands that contain hollow-bearing trees. This species is reported to occur in highest densities Perup/Kingston area, Collie River valley, and near Margaret River and Busselton (DBCA, 2012). The trees within the application area may contain hollows suitable for nesting by the south-western brush-tailed phascogale. In the absence of surveys of trees within the application area, the clearing permit has been conditioned to require the inspection of trees and management of individuals if encountered.

### **Water rat**

The Rakali, or water rat, occupies a unique niche within south-west systems, being the only amphibious or semiaquatic species in the region (feeding largely underwater, but living on land). While a distribution map for the species is not available, the species is broadly expected to occur throughout much of the south-west living in burrows on low banks of rivers, lakes, wetlands, estuaries and even along the coast. It is noted that intact riparian vegetation and associated bank stability is critical to their survival. Noting the presence of waterbodies within the application area and riparian vegetation, the application area is likely to provide habitat for the species.

It is considered the removal of the vegetation to construct the bund and drainage would not result in the removal of significant habitat for the species but may impact individuals. A directional clearing condition has been applied to the clearing permit.

## **Quenda**

The quenda occupies areas of dense understory such as around swamps or in banksia and jarrah woodlands and are distributed near the south coast from Guilderton north of Perth to east of Esperance. Noting the known distribution and the habitat presented within the application area, it is considered the application area may provide habitat for this species.

It is considered the removal of the vegetation and the construction of the bund and drainage would not result in the removal of significant habitat for the species but may impact individuals. A directional clearing condition has been applied to the clearing permit.

## Conclusion

Based on the above assessment, the proposed clearing may result in impacts to individual fauna if present during the clearing, however this is not likely to impact on the conservation significance of the species.

## Conditions

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

- Slow directional clearing to allow water rat and quenda to move into adjacent vegetation ahead of the clearing activity will minimise impact to individuals
- Fauna management (black cockatoo, western ringtail possum and phascogale condition). This condition requires inspection of the application area prior to clearing, and
- A revegetation condition requiring the planting of 26 native trees.

### **3.2.2. Land and water resources - Clearing Principles (f), (g), (i) and (j)**

A minor nonperennial watercourse intersects the application area. A bund already exists within the application area and the proposal is to further raise the height of the existing bund along with connecting a new drainage pipe to detain stormwater and improve water quality within the townsite. Supporting documents note that the existing bund has been in place for over 20 years and is inadequate with occasional back flooding of residential and commercial properties.

The proposed clearing occurs within a watercourse and contains riparian vegetation including *Baumea vaginalis*, *Lepidosperma effusum* and *Melaleuca rhapsiophylla*. The proposed clearing has the potential for localised sedimentation or turbidity of the surface water due to the earthworks and removal of vegetation however, noting that the watercourse is intersected by a number of manmade dams, it is considered that any sedimentation or turbidity would be mitigated within the dams.

The mapped soil type within the application area has a medium to high risk of water erosion and waterlogging, a medium risk of phosphorus export, a high risk of subsurface acidification and a low flood risk. Noting that vegetation is going to be retained around the construction and the purpose of construction, it is considered that the land degradation risk categories are low and any long-term potential impacts are mitigated by the retention of vegetation around the structure, and the structure itself.

## Conclusion

It is considered that the proposed clearing may impact on local surface water quality on a temporary basis. However, as the extent of the proposed clearing is small, some riparian vegetation will be retained, and revegetation will occur upstream the proposed clearing is not likely to cause long-term deterioration in the quality of surface water.

Furthermore, the dams along the waterbody provide further mitigation of such impacts.

## Conditions

No conditions are proposed due to the temporary and minimal impact likely from the proposed clearing.

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

The application area is located within the Busselton-Capel Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act), but not within a surface water area. Therefore no approvals under the RIWI Act are likely to be required to interfere with the bed and banks of the mapped watercourse.

No Aboriginal sites of significance have been mapped within the application 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. Additional information provided by applicant

During the assessment, the Shire was requested to identify the number of trees that would be cleared directly or considered likely to be impacted by the clearing (likely death from flooding of the area). In their response, the Shire provided a table in which the species, diameter at breast height and the likely impact of trees was provided. This table is provided within section 3.2.1 Biological values - Clearing Principles (b).

The Shire committed to planting trees at a 2:1 ratio for those that would be removed during the clearing process, noting species to be planted include marri, karri, peppermint and melaleuca.

## Appendix B. Site characteristics

### B.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of small strip of native vegetation in the intensive land use zone of Western Australia. It is adjacent to school ovals and some commercial properties.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 46 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>The application area forms part of a small local linkage from the school area through to some larger remnants.</p>
Conservation areas	<p>The closest conservation area to the application area is Wooditjup National Park located approximately 1.4 kilometres to the northeast of the application area.</p>
Vegetation description	<p>Photographs and supporting information provided by the applicant indicate the vegetation within the proposed clearing area consists of <i>Baumea vaginalis</i>, <i>Lepidosperma effusum</i> and <i>Melaleuca raphiophylla</i>, <i>Agonis flexuosa</i> and <i>Eucalyptus diversicolor</i>. Representative photos are available in Appendix E.</p> <p>This is inconsistent with the mapped vegetation type(s):</p> <ul style="list-style-type: none"> <li>• Cowaramup, Cw1, which is described as a Mixture of open forest to woodland of <i>Eucalyptus diversicolor</i>-<i>Corymbia calophylla</i> and woodland of <i>Eucalyptus marginata subsp. marginata</i> -<i>Corymbia calophylla</i> on slopes and low woodland of <i>Melaleuca preissiana</i>-<i>Banksia littoralis</i> on depressions in the hyperhumid zone (Mattiske and Havel, 1998)</li> </ul> <p>The mapped vegetation type retains approximately 34 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Photographs provided by the applicant indicate the vegetation within the proposed clearing area is in degraded to completely degraded (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> <li>• Degraded - Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management</li> <li>• Completely degraded - The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species.</li> </ul> <p>The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photos are available in Appendix E.</p>
Climate and landform	<p>The application area and surrounding area is estimated to be relatively flat however the site of the drain is estimated to be a low point. The annual average rainfall is estimated to be 951 millimetres as taken from Witchcliffe.</p>

Characteristic	Details
Soil description	The soil is mapped as Cowaramup wet vales Phase, which is described as small, broad U-shaped drainage depressions with swampy floors. Gravelly duplex (Forest Grove) soils on side slopes and poorly drained alluvial soils on valley floor.
Land degradation risk	The mapped soils highly susceptible to subsurface acidification, moderately susceptible to wind erosion, water logging and phosphorus export risk.
Waterbodies	The desktop assessment and aerial imagery indicated that a minor watercourse is within the application area.
Hydrogeography	The application area is within the Busselton-Capel Groundwater Area as proclaimed under the <i>RIWI Act 1914</i> .
Flora	According to available databases, there are records of 20 flora species within the local area. Of those 20 species, three species are Priority 1 (P1), two are P2, nine are P3, four are P4 and two are threatened species.
Ecological communities	The closest ecological community to the application area is the <i>Melaleuca lanceolata</i> forests, Leeuwin Naturaliste Ridge located approximately 8.6 kilometres west of the application area.
Fauna	According to available databases, 44 fauna species have been recorded within the local area. The closest record to the application area is a Baudin's Cockatoo ( <i>Calyptorhynchus baudinii</i> ). This species has been recorded 251 times within the local area.

## B.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					
Cowaramup, Cw1**	6,144.37	1,726.07	28.09	592.86	9.65
Local area					
10km radius			46	-	-

\*Government of Western Australia (2019a)

\*\*Government of Western Australia (2019b)

### B.3. Land degradation risk table

Risk categories	Cowaramup wet vales Phase
Wind erosion	50-70% of map unit has a high to extreme wind erosion risk
Water erosion	10-30% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	10-30% of the map unit has a moderate to high flood risk
Water logging	50-70% of map unit has a high to very high waterlogging risk
Phosphorus export risk	30-50% of map unit has a high to extreme phosphorus export risk

### 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 area proposed to be cleared does not contain locally or regionally significant flora, fauna, habitats, assemblages of plants.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<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 is unlikely to contain significant foraging, roosting or breeding habitat for fauna.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<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 unlikely to contain habitat for flora species listed under the BC Act.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<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 can indicate a threatened ecological community.</p>	Not likely to be at variance	No
<b>Environmental value: 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></p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
The extent of the mapped vegetation type and the native vegetation in the local area is 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><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 any nearby conservation areas.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<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> Given a water courses is within the application area; the proposed clearing may impact on- or off-site hydrology and water quality.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<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 highly susceptible to subsurface acidification, moderately susceptible to wind erosion, water logging and phosphorus export risk. Noting the extent of the application area and the purpose of the clearing, the proposed clearing is not likely to have an appreciable impact on land degradation but may have temporary impacts.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<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 a minor water courses is recorded within the application area; the proposed clearing may impact surface or ground water quality.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<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> <i>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.</i></p> <p>Given a watercourse is recorded within the application area, the proposed clearing may contribute to waterlogging.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

## 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.

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, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.



**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 3: Aerial imagery from 2003 (Landgate, 2021)



Figure 4: Photographs of the application area (Shire of Augusta-Margaret River, 2021)



Figure 5: Photographs of the application area (Shire of Augusta-Margaret River, 2021)



Figure 6: Photographs of the application area (Shire of Augusta-Margaret River, 2021)



Figure 7: Photographs of the application area (Shire of Augusta-Margaret River, 2021)



Figure 8: Photographs of the application area (Shire of Augusta-Margaret River, 2021)

## Appendix F. Sources of information

### F.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://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)
- 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
- Wheatbelt Wetlands Stage 1 (DBCA-021)

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)

## F.2. References

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

Commonwealth of Australia (2012) *EPBC Act Referral guidelines for three black cockatoo species*, Canberra

Department of Biodiversity Conservation and Attractions (2012) Factsheet Brush-tailed Phascogale

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](https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf).

Department of Parks and Wildlife (DPaW, 2017), *Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan*, Western Australia

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 29 June 2021).

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](https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF).

Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.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>

Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Landgate (2021), Government of Western Australia, *Aerial imagery of Lot 568 on Plan 400255*,

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.
- 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.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Augusta Margaret River (2021) *Clearing permit application CPS 9293/1*, received 18 May 2021 (DWER Ref: DWERDT453194).
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 29 June 2021)