GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7943/3
Permit Holder:	B. & J. Catalano Pty Ltd
Duration of Permit:	From 3 January 2019 to 3 January 2034

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I –CLEARING AUTHORISED

1. **Purpose for which clearing may be done**
   Clearing for the purpose of extraction and processing.

2. **Land on which clearing is to be done**
   Lot 501 on Deposited Plan 26892, Roelands

3. **Area of Clearing**
   The Permit Holder must not clear more than 1.2 hectares of native vegetation within the combined areas hatched yellow in Figure 1 of Schedule 1.

4. **Application**
   This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. **Period in which clearing is authorised**
   The Permit Holder shall not clear any native vegetation after 31 May 2029.

PART II –MANAGEMENT CONDITIONS

6. **Avoid, minimise and reduce the impacts and extent of clearing**
   In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

   (a) avoid the clearing of native vegetation;

   (b) minimise the amount of native vegetation to be cleared; and

   (c) reduce the impact of clearing on any environmental value.

7. Fauna management – black cockatoos

(a) Prior to undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow in Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to conduct an inspection of the permit area to identify *black cockatoo nesting tree/s* being utilised by Carnaby's black cockatoo (*Zanda lateriosis*), Baudin's cockatoo (*Zanda baudinii*) or forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

(b) Where *black cockatoo nesting tree/s* are identified under condition 7(a), the permit holder must engage a *fauna specialist* to map *black cockatoo habitat tree/s* within the permit area.

(c) Each *black cockatoo nesting 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 nesting tree* with no evidence of current or past use by *black cockatoo species* is identified in accordance with condition 7(a), that tree must only be cleared immediately after the inspection.

(e) Where a *black cockatoo nesting tree* is identified within the combined areas cross-hatched yellow in Figure 1 of Schedule 1 and that tree shows evidence of current or past breeding use by *black cockatoo species* under condition 7(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 nesting 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 7(e).

(g) For each *black cockatoo nesting tree* with evidence of current or past breeding use by *black cockatoo species* identified that cannot be avoided, the permit holder must install two (2) artificial black cockatoo nest hollows.

(h) Each artificial black cockatoo nesting hollow required by condition 7(g) must be installed prior to commencement of the next *black cockatoo breeding season* following clearing of the related *black cockatoo nesting trees*.

(i) The artificial black cockatoo nest hollow(s) required by condition 7(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 2, 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 in 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 time(s) and date(s) of inspection(s) by the *fauna specialist*
  (ii) a description of the *fauna specialist* inspection methods used
  (iii) the location of the *black cockatoo nesting tree(s)* recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees
  (iv) the location of any black cockatoos if identified, recorded using a GPS unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees
  (v) the amount of any black cockatoos identified
  (vi) whether the *black cockatoo nesting tree/s* identified show current use by black cockatoos
  (vii) a photo of the *black cockatoo nesting tree(s)* identified;
  (viii) a description of the *black cockatoo nesting tree(s)* identified, including the:

(i) species of *black cockatoo nesting tree(s)*; and
(ii) condition of the *black cockatoo nesting tree(s)*.

(ix) the time and date each *black cockatoo nesting tree* with evidence of current of past breeding use was cleared.

8. Revegetation – offset

(a) By no later than 1 September 2025 the Permit Holder must implement and adhere to the *Revegetation Plan*. This includes, but is not limited to the following actions:
(i) establish 2.04 hectares *Corymbia calophylla* and *Eucalyptus marginata* trees within an area cross-hatched orange on Figure 3 of Schedule 1;
(ii) ensure only *local provenance* species and propagating material are used to *revegetate* the area;
(iii) ensure planting is undertaken at the *optimal time*;
(iv) fence the offset site in accordance with section 5.4 of the *Revegetation Plan*. The fence must be of such a design as to prohibit access of livestock and kangaroos into the offset site while preventing native fauna entanglement;
(v) undertake weed control in accordance with section 6.1 of the *Revegetation Plan*

(b) The Permit Holder must engage an *environmental specialist* to monitor the survival of the trees established under condition 8(a) of this Permit at least once every 12 months for the remaining term of this Permit.

(c) Where monitoring required by condition 8(b) of this Permit identifies that less than 800 *Corymbia calophylla* or *Eucalyptus marginata* trees occurs per hectare of the area established, within 12 months of that monitoring event, the Permit Holder must:
(i) re-establish *Corymbia calophylla* and *Eucalyptus marginata* trees so that at least 800 trees occur per hectare of the area established.

9. Offset – conservation covenant

In respect to the areas cross-hatched orange on Figure 3 of Schedule 1, by 1 September 2026, the Permit Holder shall:

(a) give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* for the protection and management of vegetation in perpetuity; and
(b) within one (1) month of executing the conservation covenant, provide a copy of the executed covenant to the CEO

PART III – RECORD KEEPING AND REPORTING

10. Records to be kept

The Permit Holder must maintain the following records related 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	(a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA20), expressing the geographical coordinates in Eastings and Northings or decimal degrees; (b) the date(s) that the area was cleared; (c) the size of the area cleared (in hectares); and (d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit.

2.	In relation to fauna management pursuant to condition 7 of this Permit	(a) the time(s) and date(s) of inspection(s) of the suitable *black cockatoo nesting tree* by the *fauna specialist*; (b) a description of the *fauna specialist* inspection methodology employed; (c) the species name of any fauna determined by the *fauna specialist* to be occupying the suitable black cockatoo nesting tree; (d) where the suitable *black cockatoo nesting tree* is determined by the fauna specialist to be occupied by Carnaby's cockatoo (*Zanda latirostris*), Baudin's cockatoo (*Zanda baudinii*) or forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*): (i) the time and date it was determined to no longer be occupied; and (ii) a description of the evidence by which it was determined to no longer be occupied. (iii) the time and date that the suitable *black cockatoo nesting tree* was cleared.
4.	In relation to revegetation pursuant to condition 8 of this Permit	(a) the boundaries of the area where the *Corymbia calophylla* and *Eucalyptus marginata* trees were established, recorded using a GPS unit set to GDA20, expressing the geographical coordinates in Eastings and Northings or decimal degrees; (b) the size of the area (in hectares) where the *Corymbia calophylla* and *Eucalyptus marginata* trees were established; (c) the date the *Corymbia calophylla* and *Eucalyptus marginata* trees were established; (d) the number of *Corymbia calophylla* and *Eucalyptus marginata* trees established; (e) the dates of each monitoring event required by condition 8(b) of this Permit; (f) the density of the surviving *Corymbia calophylla* and *Eucalyptus marginata* trees recorded for each monitoring event; (g) the date(s) any *Corymbia calophylla* or *Eucalyptus marginata* trees were re-established in accordance with condition 8(c)(i) of this Permit; (h) the number of *Corymbia calophylla* and *Eucalyptus marginata* trees re-established on each date; (i) the date(s) any remedial actions were taken in accordance with condition 8(c)(ii) of this Permit; and (j) a description of the remedial actions undertaken on each date.

11. Reporting

(a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
  (i) of records required under condition 10 of this Permit; and
  (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.

(b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.

(c) Prior to 3 October 2033, the Permit Holder must provide to the CEO a written report of records required under condition 10 of this Permit where these records have not already been provided under condition 11(a) of this Permit.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
black cockatoo nesting tree	means trees that have a diameter, measured at 1.3 metres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Eucalyptus salmonophloia* or *Eucalyptus wandoo*) that contains hollows suitable for breeding by black cockatoo species
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
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 *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
environmental specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under the permit, or who is approved by the CEO as a suitable environmental specialist.
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 Biodiversity Conservation Act 2016.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
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.
optimal time	means the period from May to June for undertaking planting.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.

rehabilitate/rehabilitated/rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate/revegetated/revegetation	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
Revegetation Plan	means the plan titled '*Offset Planting, Hard Rock Quarry, Lot 501 Coalfields Road, Wellington – 30 June 2024*' prepared for B & J Catalano Pty Ltd to support the revegetation of the offset site in accordance with condition 8 of this permit
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or not indigenous to the area concerned.

END OF CONDITIONS

Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

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

17 July 2024

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

Figure 1: Map of the boundary of the area within which clearing may occur

Figure 2: Map of the boundary of the area within which condition 7 applies.

Figure 3: Map of the boundary of the area within which condition 8 applies.

Schedule 2

Artificial Hollows for Black Cockatoos

Department of Biodiversity, Conservation and Attractions
GOVERNMENT OF WESTERN AUSTRALIA

FAUNA NOTES

Artificial Hollows for Black Cockatoos

There are three species of threatened black cockatoos in the southwest of Western Australia (WA): Baudin's cockatoo *Zanda baudinii* (previously *Calyptorhynchus baudinii*), Carnaby's cockatoo *Zanda latirostris* (previously *Calyptorhynchus latirostris*) and forest red-tailed black cockatoo *Calyptorhynchus banksii naso.* Some of the main threats to the three species include nest hollow shortages due to ongoing and extensive habitat loss and degradation, lack of recruitment of new hollow bearing trees, and competition with galahs, corellas, and feral European honey bees.

Carnaby's cockatoo nestlings in an artificial hollow. Note this chewing post will require replacement following breeding. Photo: Rick Dawson

Artificial hollows can be used to help conserve these threatened black cockatoos by enabling them to breed in areas where natural hollows are limited. This Fauna Note provides advice on how to select an appropriate site, guidelines on how to design and place artificial hollows, and advice on how to maintain and monitor artificial hollows. The information presented here is based on experience with Carnaby's cockatoo which have many examples of successful use of artificial hollows and forest red-tailed black cockatoo which have a few known examples of use. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

Sometimes a site may not be suitable for artificial hollows. This Fauna Note includes options for alternative conservation actions that are important to the conservation of black cockatoos and can also be used to complement the placement of artificial hollows.

It is important to remember that the retention of both old and dead trees (stags) that have suitable hollows for black cockatoos is crucial for breeding, and natural replacement of hollow bearing trees for future breeding is vital for the long-term survival of the species. The installation of artificial hollows should not be used to justify the removal of natural hollow-bearing trees.

When to Use Artificial Hollows

Artificial hollows may be useful at sites where natural hollows are a limiting resource. However, cockatoos may not always use artificial hollows, for example if provided in non-traditional nesting areas. Artificial hollows that are installed within 2 km of current breeding sites are regularly taken up. There are ways to select sites for artificial hollows that will increase the chance that they will be used and that birds will be able to successfully raise chicks.

Where do black cockatoos nest?

Black cockatoos nest in the hollows of mature trees in uncleared or remnant Eucalypt woodland or forest, as well as in remnant paddock trees. Trees may take more than 120 years to develop hollows that are a suitable size, and cockatoos use hollows in both living and dead trees. Refer to the maps at the end of this document for the known breeding range of the three species of black cockatoo.

Carnaby's cockatoos generally breed in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested areas, and Tuart along the Swan Coastal Plain. They are also known to nest in Jarrah, Flooded Gum, York Gum, Gimlet, Powderbark Wandoo, and Karri.

Baudin's cockatoos generally nest in Jarrah, Marri, and Karri in densely forested areas. They are also known to nest in hollows in Wandoo and Tuart.

The breeding habitat for forest red-tailed black cockatoos is in uncleared forest or remnant patches of old Marri. They are also known to nest in Karri, Wandoo, Bullich, Blackbutt, Tuart, and Jarrah.

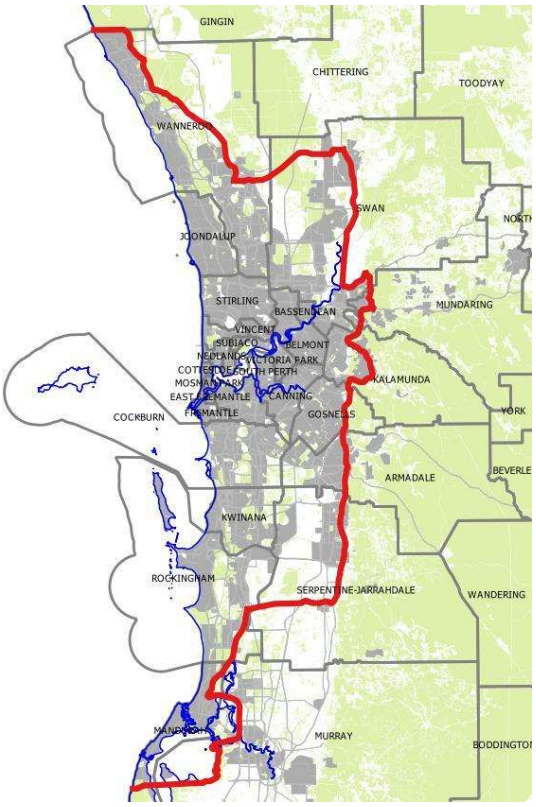
Is my site suitable for artificial hollows?

It is recommended that artificial hollows be used in known nesting areas where there has been a decrease in the availability of natural nesting hollows. Trials have shown that Carnaby's cockatoo and forest red-tailed black cockatoos will nest in artificial hollows if installed in suitable areas and are of a satisfactory design. However, putting up artificial hollows may not be the best way to help black cockatoos in your area.

Indeed, attracting birds to attempt to breed in unsuitable areas may result in increased risk of harm to adult birds or their chicks. The installation of artificial hollows in built up and urbanized areas of the metropolitan Perth and Peel regions, and other urban centres in the southwest is not recommended and should not be undertaken. This is due to the increased risk in this area, including car strike to young inexperienced birds, attack by predators such as Australian ravens and pets, and in highly urbanised and cleared areas there may not be sufficient food resource for the adults to successfully raise chicks).

To decide if your site is suitable for artificial hollows you need to consider five essential criteria (Table 1). If your site does not match all criteria, you may wish to consider alternative conservation actions including:

- protecting habitat by fencing and/or rabbit and stock control to encourage regeneration of native vegetation;
- controlling competitive species such as galahs, corellas and feral bees that may occupy hollows;
- repairing old and damaged natural nesting hollows;
- providing access to fresh water;
- revegetating with preferred food species and nesting trees; and/or
- creating linkages of vegetation between nesting and feeding areas.



Installing artificial hollows in built up areas to the west of the red line above, increases the risk of harm to birds. No artificial hollows should be installed west of this line. (green = remnant vegetation; grey = extent of existing and future urban and industrial development)

Table 1: Essential criteria for a site to be considered suitable for installation of artificial hollows, with alternative conservation actions suggested for each criterion that is not met.

1.	**The site is Eucalypt woodland or forest within the known breeding range of the species**	
	Important consideration	Carnaby's cockatoos tend to nest in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested area and Tuart along the Swan Coastal Plain. Baudin's cockatoos generally nest in Jarrah, Marri, and Karri and forest red-tailed black cockatoos usually nest in Marri.
	Alternative conservation actions	If the site is not within the known current breeding range of black cockatoos, then it is unlikely that the installation of artificial hollows will attract the birds to the site. However, black cockatoos are highly mobile species that also require habitat for feeding and roosting which means that it is important to protect and manage habitat visited by the cockatoos by fencing, and carrying out other management, such as rabbit and stock control, to retain existing habitat, and to encourage regeneration of native vegetation. It is also important to revegetate areas within the breeding and non-breeding areas with preferred food species, and to create linkages of vegetation to assist the movement of the birds through the landscape.
2.	**Breeding by Black cockatoos is known or suspected at the site. There must also be evidence that a lack of suitable available tree hollows is preventing breeding that would otherwise occur in the area.**	

	Important consideration	If the lack of available hollows is due to nest competitors such as galahs, western long-billed corellas or feral bees then any attempt to install artificial hollows must be accompanied by efforts to deter or control these competitors. Alternatively, successful control of competitors may mean that artificial hollows are not needed.
	Alternative conservation actions	If sufficient suitable natural hollows are available in an area, then there is no need to install artificial hollows. This overcomes the need for ongoing maintenance of unnecessary artificial hollows. If breeding is already occurring at the site and there are plenty of available hollows, efforts can be redirected towards caring for existing or future nesting hollows. This may involve repairing old or damaged nesting hollows by covering cracks, removing debris blocking access to hollows or replacing rotted wood in the hollow so that the depth of the nest floor is manageable for the birds. Future hollows can be protected by preventing compaction of ground around trees, fencing and/or rabbit and stock control to encourage regeneration to produce future nesting trees, fire management, and the strategic pruning of limbs to prevent limbs breaking and tearing open hollows. Efforts can also be aimed at enhancing the success of existing breeding by revegetating with preferred food and nesting species, as well as creating linkages of suitable vegetation and fresh water between nesting and feeding areas. If breeding is not occurring at the site despite hollows being available, then there may be a range of factors making the site unsuitable for breeding. These factors must be identified and addressed before breeding can resume in the area (if at all possible). Lack of sufficient food could be the cause, and this can be addressed by revegetating with preferred food species and increasing connectivity in the landscape. To compile a list of plant species suitable for revegetation at your site, refer to the document *Plants Used by Carnaby's Black Cockatoo* available on the Department of Biodiversity, Conservation and Attractions (DBCA) black cockatoo webpage.
3.	**The artificial hollows can be located in close proximity to adequate feeding areas – within a 12 km radius.**	
	Important consideration	Feeding areas commonly contain proteaceous species such as banksias (including dryandras) and hakeas. A list of food plants can be obtained by use of the document *Plants Used by Carnaby's Black Cockatoo*.
	Alternative conservation actions	If the site is not close to adequate food, then the black cockatoos will not be able to successfully raise young. Cockatoos require sufficient food close to nesting areas in order to be able to forage during the day and return to feed nestlings. Existing feeding habitat close (within 12km) to breeding areas can be protected by fencing and/or undertaking rabbit and stock control to encourage regeneration of native vegetation. The amount of feeding habitat in an area can be increased by planting or revegetating with preferred food species.
4.	**The hollows are placed in secure locations and the owner/manager of these areas is supportive and willing to provide the necessary long-term security and annual maintenance for the entire time that the artificial hollow will be in place.**	
	Important consideration	For advice on the monitoring and maintenance requirements, please refer to the section on how to monitor and maintain artificial hollows.
	Alternative conservation actions	Artificial hollows can be subject to nest robbing and vandalism. It is highly recommended that artificial hollows are not put in exposed or easily accessible areas such as road verges unless they are above 8m and placed on the side of trees away from roads. If the site is considered at high risk of nest robbing or vandalism then alternative actions to assist the conservation of the species are recommended including: revegetation, fencing, repairing old or damaged natural nesting hollows and planting vegetation linkages to connect nesting and feeding areas.
5.	**A suitable artificial hollow design is used.**	
	Important consideration	For greatest chance of success, please refer to the sections below on how to design and place artificial hollows.
	Alternative conservation actions	If an alternative design is proposed, it is recommended that Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or WA Museum are contacted to discuss and approve design.

How to Design and Place Artificial Hollows

A wide variety of artificial hollow designs have been previously used with mixed success. Evidence suggests that, while artificial hollows 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.

Successful artificial hollows have been constructed from sections of salvaged natural hollows, or black and white industrial pipe. Research results show that the most effective artificial hollows are made of plastic culvert pipe which is readily available, durable, light, cheap, and easy to install and maintain (see right picture below). When using non-natural materials care must be taken to ensure there are no toxic residues, and that the materials are safe to ingest.

Below are three examples of successful artificial hollows that have been used by black cockatoos for nesting:

- natural log with cut side entrance (left);
- white industrial pipe with top entrance (centre); and
- DBCA recommended polypropylene pipe design (right)



Photo: Christine Groom (left), Rick Dawson (centre and right)

The notes below provides general guidance on design and construction of artificial hollows for black cockatoos. Additional specifications are provided at the end of this Fauna Note which outline current best practice and may be considered recommendations for minimum requirements.

Walls, size, base, and entrance design

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

- durable enough to withstand exposure to elements for at least 20 years; and
- able to simulate the thermal properties of a natural tree hollow.

Artificial hollows should be:

- not less than 375 mm in internal diameter; and
- preferably 1200 mm deep overall with 200 mm of substrate/nesting material covering the base.

The base of the artificial hollow must be:

- securely fixed to the walls and able to support the weight of an adult and nestling(s);
- durable enough to last the life of the nest, and survive chewing by cockatoos;
- free draining;

- at least 375 mm in diameter; and
- covered with 200 mm of sterile, dry, free draining substrate/nesting 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. Zincalume®), thick hard plastic, thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to fit internally with sharp or rough edges ground away or curled inwards, be fixed securely to the walls and have small drainage holes.

The entrance of the artificial hollow:

- must have a diameter of at least 375 mm; and
- preferably be top entry which will minimise use by non-target species.

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

Adding ladders and sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds access to the hollow, and sacrificial chewing posts so that birds can chew material, and so that non-target species can exit the hollow. The post can also assist in providing further material to the substrate, however research has shown that not all posts are heavily chewed.

The ladder must be:

- securely mounted to the inside of the hollow;
- made from an open heavy wire mesh with a mesh size of 30 - 50 mm (such as WeldMesh™); or heavy chain; and
- reach to, or below the level of substrate/nesting material.

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.

Do not use material for ladders that the birds can chew, including galvanised metal because the birds may grip or chew the ladder, and ingest harmful compounds.

The sacrificial chewing posts must be:

- made of untreated hardwood such as Jarrah, Marri or Wandoo;
- thick enough to satisfy the birds' needs between maintenance visits;
- extended beyond the top of the hollow as an aid to see whether the nest is being used and reach to the floor of the hollow;
- placed on the inside of the hollow; and
- attached in such a way that they are easy to replace (e.g. a 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 one chewing post is provided. Posts 70 x 50 mm have been used but require monitoring at least every second breeding season when the nest is active and replacing when found to be no longer reaching the nesting material or otherwise significantly chewed. Birds do vary in their chewing habits, and therefore the frequency at which the chewing posts require replacement will also vary.

Mounting and placement

It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance, but preferably not conspicuous to the general public.

The height at which artificial hollows should be placed is variable, between 4 - 8m for Carnaby's cockatoo, and the average height of natural hollows in dominant tree species in the area is a good guide. If located in an area that the general public cannot access, such as a private property, the hollows can be placed as low as 4 m from the ground so that they are easily accessible by ladder. If located in an area where the general public are allowed access, hollows should be placed at least 8 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.

Black cockatoos 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; and
- fitted on the side where the most shade can be obtained.

Artificial hollows must be mounted such that:

- the fixings used will last the duration of the nest e.g. galvanized bracket or chain and fixed with galvanized coach screws;
- it is secured by more than one anchor for security and stability;
- it is positioned vertically or near vertically; and
- where possible living trees are to be used to provide shade.

Artificial hollows should not be placed in the open on poles, as this may result in excessive exposure to sun during very hot weather.

Safety

Care needs to be taken when placing artificial hollows to ensure human safety is paramount.

Monitoring and Maintaining Artificial Hollows

It is important to monitor and maintain artificial hollows after they have been erected to ensure their effectiveness and so that problems with pest species or maintenance requirements can be identified and resolved. This will ensure the artificial hollow continues to provide opportunities to be used and that birds will be able to successfully raise chicks

Without regular maintenance, artificial hollows are likely to fail to achieve their objective to provide safe nesting opportunities for threatened black cockatoos. Therefore, it is important to continue a regime of regular maintenance for however long the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval.

How do I monitor artificial hollows?

Before undertaking monitoring of artificial hollows for black cockatoos, it is recommended that you seek advice from the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum. It is also important to contact the Department's Wildlife Licensing Section, to determine if a lawful authority required (https://www.dbca.wa.gov.au/licences-permits).

Monitoring artificial hollows requires keen observation, and naturalist skills. It is often not possible to observe direct evidence of breeding (i.e. nestlings or eggs) and therefore inferences must be made based on other observations. It is also important to limit disturbance to breeding birds. There are many techniques available to monitor artificial hollows, and a combination of several is likely to achieve the best results (***Table 2***).

Monitoring of artificial hollows should consider and record:

- the condition of the tree, hollow fixings and general hollow condition;
- condition and connection of sacrificial chewing posts, ladder and substrate/nesting material inside hollow;
- any use by black cockatoos and nature of activity (adult birds, chewing, eggs, chicks etc.)
- details of use by non-target species (native or pest);
- identify any problems with pest species or maintenance requirements; and
- maintenance actions undertaken to resolve any problems.

The information collected from monitoring should be written down and reported. There are standard fauna report forms available on the Department's website (https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals) that can be used to record the details of your sighting. Alternatively, if you are

frequently monitoring a larger number of artificial hollows, you can put the details into a spreadsheet or use the black cockatoo monitoring forms available on the DBCA website. Records should be submitted to the Department by emailing fauna.data@dbca.wa.gov.au. The Department will put the records into the Threatened and Priority Fauna Database, and it will be used to inform conservation and management decisions. Any other opportunistic sightings of Threatened and Priority species can also be reported via the same email.

Table 2: Techniques for monitoring artificial hollows

<table>
<tr><th>Technique</th><th>Description of Technique</th></tr>
<tr><td>Looking for signs of use</td><td>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.</td></tr>
<tr><td>Observing parent behaviour around a hollow</td><td>The behaviour of parent birds around a hollow can indicate an approximate age of young in the nest.
<table>
<tr><th>Parent Behaviour</th><th>Approximate Stage and Age of Young</th></tr>
<tr><td>Prospecting for hollow</td><td>Unborn</td></tr>
<tr><td>Male only seen out of hollow</td><td>Egg or very young nestling (< 3 - 4 weeks)</td></tr>
<tr><td>Both parents seen entering/exiting the hollow</td><td>Nestling(s) has hatched (> 3 - 4 weeks)</td></tr>
</table></td></tr>
<tr><td>Observing feeding flocks</td><td>Flocks of all male birds can indicate that 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).</td></tr>
<tr><td>Tapping to flush female</td><td>When females are sitting on eggs they will usually respond to tapping or scraping at the base of their tree by appearing at the entrance or flying from the hollow opening. This is not a guarantee of breeding activity, but an indication that breeding is possibly occurring in the hollow.
Tapping or scraping is best undertaken between 10 am - 3 pm when females will most likely to be sitting.</td></tr>
<tr><td>Observing insect activity around a nest</td><td>Faecal matter produced by nestlings attracts insects, especially flies and ants. The type and number of these insects will help to 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 the entrance of a nest usually indicate that a death has occurred.</td></tr>
<tr><td>Listening for nestling</td><td>With experience it is possible to determine if nestlings are present, and a broad estimate of age based on the type and volume of noises they make.</td></tr>
<tr><td>Looking inside a nest</td><td>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 organize. Also keep in mind that it is important to limit disturbance to breeding birds. 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 to reach nests to undertake observations.</td></tr>
</table>

When do 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, frequency, and timing of monitoring (Table 3).

Breeding by the three southwest black cockatoos varies, and the timing of monitoring of artificial hollows should accommodate the breeding of the likely target species. The Commonwealth Department of Climate Change, Energy,

the Environment and Water (DCCEEW) Species Profile and Threats Database (SPRAT) database records the breeding periods of each of the species as:

- Carnaby's cockatoo - July to November (with peak between August to September)
- Baudin's cockatoo - October to January
- Forest red-tailed black cockatoo - every month, with peaks in April to June and August to October

The age of Carnaby's cockatoo nestlings can be determined by using the following publication:

Saunders, D. A., Dawson, R. and Nicholls, A. O. (2015). Aging nestling Carnaby's cockatoo, *Calyptorhynchus latirostris,* and estimating the timing and length of the breeding season. *Nature Conservation* **12:** 27-42 http://dx.doi.org/10.3897/natureconservation.12.4863

This document provides a series of photographs to illustrate changes in size and plumage of nestlings over the 10–11 weeks of the nestling period which can be used to estimate the approximate age of Carnaby's cockatoo nestlings, up to about nine weeks, by comparing appearance with the nestlings illustrated in the photographs.

Any monitoring that involving disturbance or handling of black cockatoos, requires lawful authority (https://www.dbca.wa.gov.au/licences-permits). Such activity requires specialist skills and authorisation under the *Biodiversity Conservation Act 2016*.

Table 3: Recommended frequency for monitoring artificial hollows, as determined by the aim of the monitoring

Monitoring Aim	Frequency of Visits	Monitoring Techniques
To determine possible use by black cockatoos	At least once during peak breeding season.	• Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside nest
To confirm use by black cockatoos	At least two visits during peak breeding season.	• Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside a nest Observing breeding evidence from at least two of the techniques confirms use by black cockatoos.
To determine nesting success by black cockatoos	Preferably fortnightly visits between July and December. As a minimum, at least 3 visits spread throughout breeding season.	• Observing insect activity around a nest • Listening for nestlings • Looking inside a nest The presence of eggs or nestlings inside a nest will help to determine nesting success.
To determine use by any species	As often as possible.	As a minimum, inspection from the ground: • Looking for signs of use To confirm: • Looking inside a nest
To determine maintenance requirements	At least every two years and preferably annually.	A basic maintenance check can be undertaken from the ground. Looking inside the nest using a telescopic pole with camera or mirror enables inspection of the sacrificial chewing posts and level of substrate/nesting material. A ladder or elevated work platform will be required for a comprehensive check, and to replace sacrificial chewing posts and carry out other maintenance.

How do I maintain artificial hollows?

Natural hollows used by black cockatoos are typically present for many decades and if artificial hollows are expected to provide a similar role, then they will require maintenance to ensure they continue to function as potential nesting locations for black cockatoos for the long term.

In many cases artificial hollows are required as a condition of development to offset loss of natural hollows, in which case State and Commonwealth offset policy expects that the artificial hollows continue to provide that function for the duration of the impact (or alternatively the expected period of time the natural hollow would have persisted, or the life of the environmental approval). As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Artificial hollow base needing repair.
Photo by Christine Groom

Any problems identified during monitoring or maintenance checks should be addressed as soon as possible and will require similar specialist skills and equipment as used in installation. If breeding is currently occurring, maintenance may need to be delayed if it is likely to disturb the parents or nestling. 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. Likely maintenance includes:

- replacement of sacrificial chewing posts (frequently);
- top-up or replacement of nesting substrate to ensure it reaches the ladder and chewing posts (occasionally);
- replacement of nest bases (occasionally);
- repair or replacement of attachment points (infrequently); and/or
- repair of any cracks to wooden hollows (infrequently).

For artificial hollows known to be used, spare chewing posts should be taken into the field when undertaking maintenance checks as these are likely to need replacement.

Artificial hollows are likely to need to be completely replaced after many years, and other circumstances may require the relocation of artificial hollows (e.g. if the tree they are in becomes damaged).

Applying this guidance to forest red-tailed black cockatoo and Baudin's cockatoo

The information presented here is based on experience with Carnaby's cockatoo, for which many examples of successful use of artificial hollows exist, and forest red-tailed black cockatoo for which a few known examples of use exist. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

A definite reason for this lack of use is not yet known but may relate to the location of artificial hollows installed to date (few or none placed in Baudin's cockatoo breeding sites where breeding is occurring and natural hollows are limiting) or design or installation issues, such as hollows not being installed high enough in tall forest canopy.

Before deciding to install artificial hollows for forest red-tailed black cockatoo or Baudin's cockatoo, it is recommended that you discuss your proposal with, and/or seek advice from, the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum.

Maps of Black Cockatoo Breeding Range

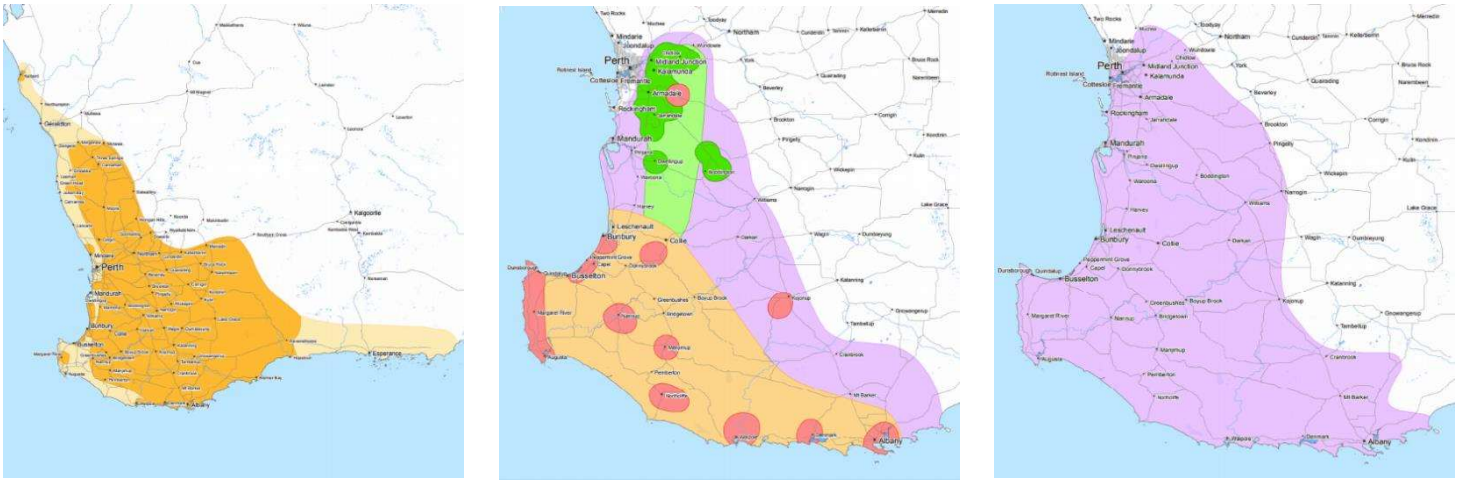


Image: Commonwealth of Australia, 2011

The maps show the modelled distributions of Carnaby's cockatoo (left), Baudin's cockatoo (centre) and forest red-tailed black cockatoo (right). For Baudin's cockatoo, the breeding range is indicated by the red (known breeding areas) and yellow (predicted breeding range), and for Carnaby's cockatoo, the breeding range is indicated by the orange.

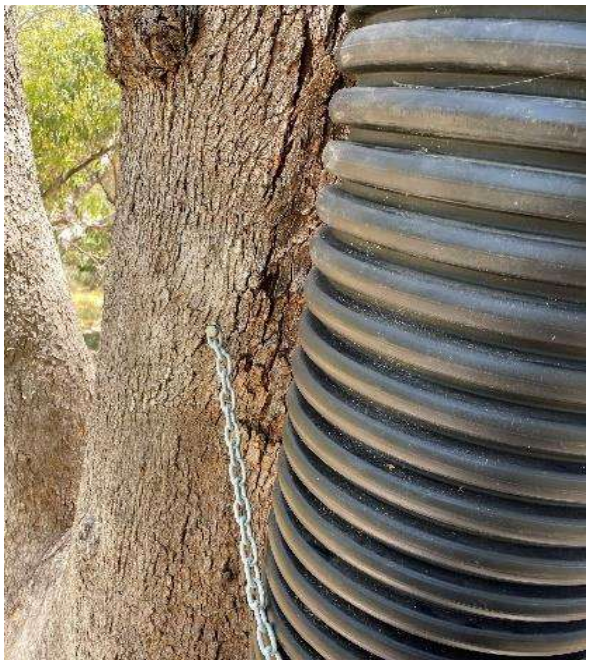
Artificial Hollows – best current design and installation specifications

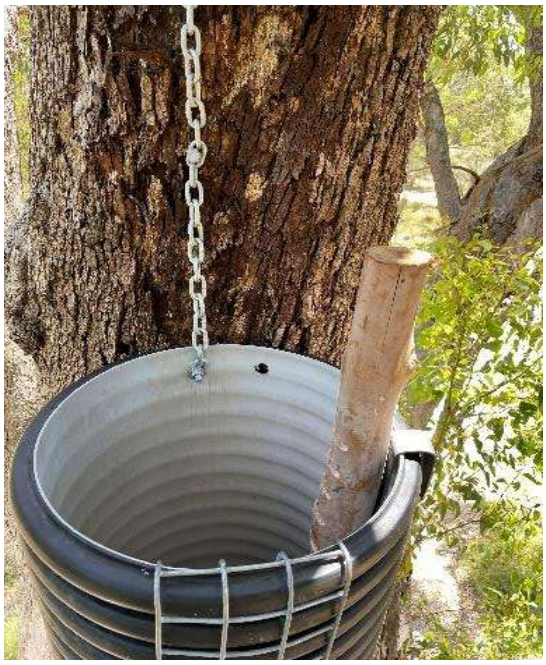
The specifications below outline the most recent detailed specifications for artificial hollow construction installation and maintenance. These would provide for a well-constructed and installed artificial hollow that is most likely to have an adequate lifespan (minimum 50-years). To ensure longevity, regular maintenance will be required on the nesting material, sacrificial post, and removal of debris from the hollow.

It is highly recommended that any artificial hollows installed as a condition of environmental approval (for example where the artificial hollow is expected to provide benefit for a long period), or installed on DBCA managed lands would meet these specifications as a minimum.

Artificial Hollow Construction Specifications

Dimensions:	internal diameter 375mm (430 mm external), 1200 mm in height, and installed a minimum of 4 m above ground on private property and 8 m on public land.
Pipe material:	Fifty-year UV rated culvert pipe (polypropylene material used with corrugated outer wall and thin inner sleeve. Recommended brand or similar: The 'Vinidex StormPRO' pipes are twin wall, corrugated, polypropylene pipes for non-pressure stormwater and drainage applications, which meet all the requirements for artificial hollows.
Chain:	6 mm galvanised (not zinc plated). The hollows will be attached to the tree by chain and fixed by 4 points.
Fixings:	Galvanised M10 coach screws four x 75 mm. Two on the weight bearing chain at the top and one each side of the hollow.
Ladder:	50 x 50 mm square galvanised weldmesh 4mm thick.
Chewing posts:	Untreated Jarrah, Marri or Wandoo that meet requirements in "Adding ladders and sacrificial chewing posts" above.





Artificial hollow design, the fixing method, and the sacrificial chewing post extending above the hollow rim. Left image shows the side chains that are to be at a 30-degree upwards angle to allow the hollow to move up the tree as the tree grows. Right image shows the top weight bearing fixing which is to be 100 mm above the hollow to allow upwards movement.

Left image shows the internal view, including substrate material placed on the floor to line the hollow, and the internal weld mesh ladder. Substrate material must be course, hard, wood chips at least 200 mm deep.

Centre image shows one hard wood sacrificial post which is to fit and connect to the rim of the hollow by a hook screwed to the post to ensure it does not come loose, block the hollow or injure the occupants.

Right image shows the hard plastic floor which is to be securely fixed with a minimum of 12 small drainage holes. Larger holes may result in the occupants chewing the base.

Monitoring and Maintaining Artificial Hollows

It is important to continue a regime of regular maintenance for however long the artificial hollow is required. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval. As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Further Reading

DBCA webpage and fauna profiles: Black cockatoos

Department information sheets: Fauna Note – Corellas and other flocking cockatoos

BirdLife Australia webpage and brochure: Identify your Black cockatoo

Western Australian Museum webpage and fact sheets: Cockatoo Care

Saunders DA et al. (2022) Artificial nesting hollows for the conservation of Carnaby's cockatoo *Calyptorhynchus latirostris*: definitely not a case of erect and forget. Pacific Conservation Biology doi:10.1071/PC21061

Acknowledgements

This Fauna Note is a joint initiative of the Department of Biodiversity, Conservation and Attractions, Birdlife Australia, and the Western Australian Museum. Many individuals have contributed to its preparation, including members of the department's Carnaby's cockatoo and forest black cockatoo recovery teams, with significant contributions from Rick Dawson (DBCA Research Associate), Ron Johnstone (WAM), Alan Elliot (Serpentine-Jarrahdale Landcare Centre), and Denis Saunders (CSIRO). This document was prepared by David Mitchell, Geoff Barrett, Kim Williams, Rebecca Bloomfield, Amie Raycraft, Brooke Richards, Teagan Johnston and Martin Dziminski.

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Disclaimer

Last updated: 08 Feb 2023

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 7943/3
Permit type:	Purpose permit
Applicant name:	B & J Catalano Pty Ltd
Application received:	6 December 2023
Application area:	1.2 hectares of native vegetation
Purpose of clearing:	Extraction and processing
Method of clearing:	Mechanical Removal
Property:	Lot 501 on Deposited Plan 26892
Location (LGA area/s):	Shire of Harvey
Localities (suburb/s):	Roelands

1.2. Description of clearing activities

This amendment is to extend the timeframe for clearing and modify the proposed clearing footprint within the southern area (see Figure 1, Section 1.5). Clearing permit CPS 7943/1 authorised the clearing of 1.2 hectares to facilitate the extraction and processing of granite. Records indicate that 0.877 hectares of clearing has been conducted under CPS 7943/1, since the commencement of the permit in 2018 (B & J Catalano Pty Ltd, 2023).

The modified clearing footprint which is subject to the amendment application includes a tree with a hollow with previous evidence of nesting use by black cockatoos. This tree was removed from the clearing envelope during the assessment of CPS 7943/1. The hollow was occupied until 2017 and has not been in use since, possibly due to the presence of the active pit (B & J Catalano Pty Ltd, 2023). Since the commencement of the permit in 2018, the pit has become unsafe due to rock hanging and the applicant has applied to modify the proposed clearing footprint to allow the clearing of one additional tree with a hollow.

1.3. Decision on application

Decision:	Granted
Decision date:	17 July 2024
Decision area:	1.2 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit amendment 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 14 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 G.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 that the Department of Mines, Industry Regulation and Safety (DEMIRS) had

inspected the site and confirmed that the additional tree in question represents an operational safety risk to the site and cannot be left in situ, and that the proposed clearing area will supply an important source of granite material for the Bunbury Outer Ring Road project (B & J Catalano Pty Ltd, 2024a).

The assessment of environmental impacts has changed since the assessment for CPS 7943/1, as an additional tree with a suitable black cockatoo breeding hollow is proposed to be cleared as part of the amendment.

Figure 1 - Previously approved area under CPS 7943/1 (orange) and current application area under CPS 7943/3 (yellow)

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 will result in the following significant residual impacts:

- the loss of 0.323 hectares of native vegetation that remains to be cleared and is suitable foraging habitat for black cockatoos
- the loss of one tree with a hollow previously used for breeding by black cockatoos.

In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, the Delegated Officer determined that the following offsets are required to address the above significant residual impacts:

- revegetation of 0.84 hectares of native vegetation, from completely degraded condition to good condition (Keighery, 1994) that contains black cockatoo foraging habitat
- installation of an additional two (2) artificial nesting boxes suitable for use by threatened black cockatoo species in the areas cross-hatched red within Lot 501

The above offsets are in addition to the revegetation required under condition 9 of CPS 7943/1 which required that an area equivalent in size to that cleared (1.2 hectares) had to be revegetated with *Corymbia calophylla* and *Eucalyptus marginata* trees. As the applicant has agreed to combine the revegetation required under the conditions of CPS 7943/1 with any additional revegetation required under CPS 7943/3, condition 9 on the amended permit has been updated to reflect the total revegetation amount of 2.04 hectares. The combined revegetation area will be placed under a conservation covenant to provide in perpetuity protection to the offset site.

The Delegated Officer determined that the above offset was sufficient to counterbalance the significant residual impacts associated with the proposed clearing. Further information on the suitability of the offsets provided is summarised in Section 4.

The Delegated Officer therefore decided to grant a clearing permit subject to the following conditions, which have been imposed on the clearing permit, to manage and address the impacts of clearing:

- avoid and minimise measures to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- pre-clearance inpsection to idenitfy black coockatoo nesting trees

- provision of an offset to be placed under a conservation covenant

Given the above and noting that the offset provided (see Section 4) counterbalances the significant residual impacts, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

1.5. Site maps

Figure 2 - Map of the application area. The areas cross-hatched yellow indicates the areas authorised to be cleared under the amended clearing permit.

Figure 3 - Map of the area to install black cockatoo artificial hollows. The areas cross-hatched red indicates areas within which condition 7 applies.

Figure 4 - Map of the revegetation offset area. The areas cross-hatched orange indicates areas within which condition 8 applies.

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
- 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)
- *Planning and Development Act 2005* (WA) (P&D Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

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 has provided reasonable justification as to the reasons the tree with a suitable hollow for black cockatoos could not be avoided as it was obstructing the operation of the pit. According to a DEMIRS report, the pit was unsafe and unable to be used until the tree was removed (see Appendix D for photographs of the proposed clearing area; B & J Catalano, 2024c). In the supporting information for the amendment application, the applicant stated 0.29 hectares of trees would be retained that were proposed to be removed under the previous clearing permit and 0.285 hectares of trees would be removed (B & J Catalano, 2023a).

After consideration of avoidance and mitigation measures, it was determined that an offset to counterbalance the significant residual impacts to black cockatoo foraging and breeding habitat were necessary. In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

A review of current environmental information (Appendix B) reveals that the assessment against the clearing principles has changed from the Clearing Permit Decision Report CPS 7943/1, as an additional tree with a suitable black cockatoo breeding hollow that was previously used in 2017, is proposed to be cleared as part of the amendment.

3.2.1. Biological values (fauna) - Clearing Principle (b)

Assessment

According to available databases, 24 conservation significant fauna species occur in the local area, six of which are recorded in similar vegetation and habitat type as the application area:

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)
- *Falsistrellus mackenziei* (western false pipistrelle)
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale)
- *Pseudocheirus occidentalis* (western ringtail possum)
- *Zanda baudinii* (Baudin's cockatoo)
- *Zanda latirostris* (Carnaby's cockatoo)

Black cockatoos

The application area is located within the mapped distribution of Carnaby's black cockatoo, forest red-tailed black cockatoos and Baudin's black cockatoo. Collectively, these species are referred to as black cockatoos. Habitat requirements for black cockatoos can be considered in terms of breeding, roosting and foraging habitat. Black cockatoos are known to nest in hollows of live and dead trees, including marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomocephala*), flooded gum *(Eucalyptus rudis*), and other Eucalyptus spp. (Commonwealth of Australia, 2022). 'Breeding habitat' for black cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, where suitable DBH for nest hollows is 300 - 500 millimetres depending on the tree species (Commonwealth of Australia, 2022). According to the desktop assessment, no breeding hollows are in the local area (10 km radius), with the closest 23.7 km from the application area.

The proposed modification to the clearing area will impact one additional tree with a suitable hollow for black cockatoos, which was previously recorded as being in use in 2017 (B & J Catalano Pty Ltd, 2024b). The loss of suitable nesting trees is one of the major contributors to the black cockatoos' decline (DCCEEW, 2022). The hollow has not recorded being used by the site staff while the extraction was taking place in the nearby gravel pit, however it may be used once extraction is finalised as black cockatoos have known nest fidelity (B & J Catalano, 2024b, Saunders et al, 2018). Given the tree is on the edge of a granite pit, the granite pit may affect the root zone of the tree through changing hydrology and potentially reduce the longevity of the tree (DBCA, 2023). Given that this hollow-bearing tree cannot be avoided, the permit conditions have been modified to require the installation of an additional two (2) artificial nest boxes.

Black cockatoos forage over a large area, feeding on a variety of native and introduced (exotic and non-WA) vegetation species. Not all suitable native vegetation will produce good foraging resources each year, so black cockatoos will vary their foraging strategy depending on availability. Black cockatoos rely upon the availability of foraging resources across their range, particularly when birds need to build condition after breeding and are teaching juveniles where foraging resources are located. Lack of foraging resources increases the likelihood that birds will not regain condition after breeding, will not breed again the following season, and that juveniles will not survive to become part of the adult population. Food resources within the range of breeding sites and roost sites are critical to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (DAWE, 2022). The application area was not considered to be suitable roosting habitat in the 2017 black cockatoo habitat assessment, that was carried out as part of the previous clearing permit CPS 7943/1 (DWER, 2017). According to the desktop assessment there are five black cockatoo roosts in the local area (10 km radius), with the closest 2.92 kilometres from the application area. While the application area may not provide suitable roosting habitat, the close proximity to suitable roosts and perennial water sources within the local area, means the application area could provide suitable habitat for black cockatoos.

The extent of black cockatoo foraging habitat impacted by the amendment remains at 1.2 hectares, with previous foraging evidence found in the 2017 black cockatoo habitat assessment (DWER, 2017). The local area (10 km radius) has 16,802 hectares of mapped black cockatoo feeding habitat and the application area represents 0.007 per cent of the local black cockatoo feeding habitat. In order to mitigate the impacts to black cockatoo foraging habitat approved under clearing permit CPS 7943/1, a condition was imposed on the permit requiring the revegetation of the area equivalent in size to that cleared (1.2 hectares) of jarrah and marri trees within the areas cleared. Noting the cumulative impacts to black cockatoo foraging habitat since the permit was originally granted in 2018 and recognising that the clearing yet to be conducted will impact on high quality foraging habitat within close proximity to a known breeding area, the Delegated Officer determined it appropriate to offset these impacts. An offset has been conditioned on the permit which requires the revegetation of 0.84 hectares of black cockatoo foraging species in a good condition, in addition to the revegetation of 1.2 hectares required under CPS 7943/1.

Western false pipistrelle

The Western false pipistrelle lives mainly in wet sclerophyll forests of karri, jarrah and tuart eucalypts and roost in hollows in old trees, branches and stumps (Australian Museum, 2020). The application area contains jarrah and three records of Western false pipistrelle were found within the local area, with the closest 4.76 kilometres from the application area. Given this, the western false pipistrelle may range through the application area, however, it is unlikely to be significantly impacted by the proposed clearing.

South-western brush-tailed phascogale

The south-western brush-tailed phascogale is found in dry sclerophyll forests and open woodlands that have hollow bearing trees; it is strongly arboreal and has a home range of 20-70 hectares (DEC, 2012). There have been 46 records in the local area with the closest 2.05 kilometres from the application area. The application area is mostly surrounded by cleared farmland, with some connected native vegetation to the south. While the south-western brush-tailed phascogale may range through the application area, it is unlikely to be significantly impacted by the proposed clearing.

Western ringtail possum

The western ringtail possum is found in jarrah and marri forests with limited anthropogenic disturbance, that have predation control and low fragmentation (DPaW, 2017). As the application area is fragmented and is in use as a pit, it is unlikely that the western ringtail possum will be significantly impacted by the proposed clearing (Appendix D).

Conclusion
Based on the above assessment, the proposed clearing will result in loss of suitable breeding and foraging habitat for the black cockatoo.

For the reasons set out above, it is considered that the impacts of the proposed clearing on black cockatoo foraging and breeding can be managed through revegetation of suitable black cockatoo foraging habitat and installation of artificial hollows.

The applicant has referred the proposal to the Department of Climate Change, Energy, the Environment and Water as the application area will impact on habitat for the Baudin's black cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo. The application is currently being assessed by DCCEEW under the provisions of the EPBC Act.

Conditions
To address the above impacts, the following management measures have been imposed as conditions on the clearing permit:

- inspect suitable black cockatoo nesting trees to confirm whether they are occupied by black cockatoos; if the tree is occupied, then no clearing shall occur within 10 metres of the tree until the tree is no longer occupied
- prior to clearing the suitable black cockatoo nesting tree, install an additional two artificial black cockatoo nest hollows within the areas hatched red (see Figure 3)
- 2.04 hectares of *Corymbia calophylla* and *Eucalyptus marginata* trees must be established and placed under a conservation covenant within Lot 501 on Deposited Plan 26892

3.3. Relevant planning instruments and other matters

The Shire of Harvey advised DWER that local government approvals are not required due to the existing extractive industry licence, and that the proposed clearing is consistent with the Shire's Local Planning Scheme (Shire of Harvey, 2024). The Shire did not have any objections to the proposed clearing.

The State Administrative Tribunal granted a development approval under the Greater Bunbury Regions Scheme and the Shire of Harvey District Planning Scheme No 1 on 31 March 2017 for a period of 15 years. The extractive industry licence was obtained from the Shire of Harvey on 21 September 2018 for a period of 5 years, with an additional 5year extension provided until 31 May 2029 (B & J Catalano, 2024d).

DWER granted a Licence amendment (L9113/2018/1) to the applicant for the crushing and screening of up to 350,000 tonnes of material per year on 4 October 2021. The licence is valid until 21 September 2033.

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.

4 Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- the loss of 0.323 hectares of foraging habitat for black cockatoos,
- the loss of one tree with a suitable nest hollow for black cockatoos

In assessing whether the proposed offset is adequate and proportionate to the significance of environmental values being impacted, a calculation using the WA State Offset Metric was undertaken for the vegetation yet to be cleared under CPS 7943/1. The calculation indicates that the proposed offset will counterbalance 100 percent of the significant residual impacts of clearing and is therefore consistent with the WA Environmental Offsets Policy, September 2011. The justification for the values used in the offset calculation is provided in Appendix F.

Using the WA State Offset Metric calculator, the following actions are required to offset the significant residual impact of the proposed clearing:

- Revegetation and in-perpetuity protection of 2.04 hectares of native vegetation within Lot 501 on Deposited Plan 26892, as detailed below:
    - revegetation of 0.84 hectares of native vegetation, from completely degraded condition to good condition that contains black cockatoo foraging habitat to counterbalnce the impacts of the clearing yet to be done under CPS 7943/1
    - revegetation of 1.2 hectares of *Corymbia calophylla* and *Eucalyptus marginata* trees as per the existing requirements of condition 9 under clearing permit CPS 7943/1
- Installation of an additional two (2) artificial nesting boxes suitable for use by threatened black cockatoo species

The applicant agreed to combine the two revegetation actions and place the revegetation under a conservation covenant. A revegetation plan provided by the applicant stated 800 *Corymbia calophylla* (Marri) and *Eucalyptus marginata* (Jarrah) trees per hectare would be planted along with additional species such as *Agonis flexuosa*, *Eucalyptus patens*, *Allocasuarina huegellana* and *Banksia grandis*, with monitoring of the revegetation to be conducted for five years (B & J Catalano, 2024e). The offset site is located 1.55 km south-west of the application area, within Lot 501 on Deposited Plan 26892. The allocated offset site *c*omprises a 3.86 hectare area, within which 2.04 hectares of revegetation will be undertaken. The offset area will be placed under a conservation covenant under section 30B of *the Soil and Land Conservation Act 1945*. The conservation covenant will be registered on the Certificate of Title of the property and will require the protection and management of the vegetation in perpetuity.

The Delegated Officer considers that the above revegetation action will adequately counterbalances the significant residual impacts listed above.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
B & J Catalano (2024a) evidence that granite pit extraction will provide material for Bunbury Outer Ring Road project	Section 1.4
B & J Catalano (2024b) provides evidence of no recent use of Black cockatoo nesting tree proposed to be removed in this amendment	Section 3.2.1
B & J Catalano (2024c) DEMIRS report into unsafe pit	Section 3.1
B & J Catalano (2024d) Extractive industry licence	Section 3.3
B & J Catalano (2024e) Revegetation plan	Section 4

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an isolated patch of native vegetation in the intensive land use zone of Western Australia. It is surrounded by rural land and conservation reserves. Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 50 per cent of the original native vegetation cover.
Ecological linkage	The closest ecological linkage is the South West Regional Ecological Linkage mapped approximately 900 m west of the application area.
Conservation areas	The nearest conservation area is the Wellington National Park, located approximately 980 m east of the application area.
Vegetation description	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area consists mostly of *Corymbia calophylla* and *Eucalyptus marginata* over pasture grasses with some *Xanthorrhoea gracilis*, *Darwinia citriodora*, *Xanthorrhoea preissii*, *Grevillea wilsonii* and *Trymalium floribundum*. This is consistent with the mapped vegetation types: • Dwellingup D1, which is described as open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones. • Lowdon, which is described as open forest of *Corymbia calophylla-Eucalyptus marginata* subsp. *marginata-Agonis flexuosa* with some *Eucalyptus wandoo* and occasional *Corymbia haematoxylon* on slopes, and woodland of *Eucalyptus rudis-Melaleuca rhaphiophylla* on valley floor. The mapped vegetation types retain approximately 86.83 and 36.64 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in Completely Degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix F. Representative photos are available in Appendix D.
Climate and landform	The closest BOM weather station is in Wokalup approximately 18 kilometres from Roelands (BOM, 2024). The highest mean maximum temperature is 31 degrees celsius in January and the lowest at 16.7 degrees celsius in July. The highest mean

Characteristic	Details
	minimum temperature is 18.1 degrees celsius in February and lowest at 7.9 degrees celsius in August. The average annual rainfall is 928 mm. The application area is in two land systems, the Lowden Valleys System and the Darling Plateau System.
Soil description	The soil of the application area was described as thin brown loam soils over light coloured and mottled local clay and clay subsoils over weathered granite. The soil is mapped as: • Balingup moderate slopes phase which is described as friable red-brown loamy earths, brown loamy earths, brown deep loamy duplexes and loamy gravels; • Bridgetown steep slopes phase which is described as friable red/brown loamy earths, brown loamy earths, brown deep loamy duplexes and stony soils; • Grimwade subsystem which is described as loamy gravels, friable red/brown loamy earths, brown loamy earths and brown deep loamy duplexes; • Hester ironstone gravel ridges phase which is described as loamy gravels and duplex sandy gravels with some deep sandy gravels, shallow gravels, deep sands and loams.
Land degradation risk	The application area is mapped as high wind erosion, water erosion, subsurface acidification and phosphorus export risk. However, the limited clearing area consisting mostly of scattered trees over pasture grasses is unlikely to increase the land degradation risk.
Waterbodies	The desktop assessment and aerial imagery indicated that there is one minor non-perennial watercourse located within the area proposed to be cleared.
Hydrogeography	The application area is in the Collie River Irrigation District as proclaimed under the *Rights in Water and Irrigation Act 1914*. No RIWI permit was advised as being required under the previous permit CPS 7943/1.
Flora	The desktop assessment identified nine conservation significant flora species in the local area. Based on the desktop assessment, two of these, *Lomandra whicherensis* and *Stylidium acuminatum* subsp. *acuminatum* were in similar soil, vegetation and habitat types as those mapped in the application area. However, considering the majority of the area is parkland cleared in a completely degraded condition, it is unlikely that any conservation significant flora will be impacted by the proposed clearing.
Ecological communities	The closest mapped threatened ecological community is the Banksia woodlands of the Swan Coastal Plain. The vegetation within the application area is not representative of the threatened ecological community.
Fauna	The desktop assessment identified 24 conservation significant fauna species in the local area, six of which have been recorded in similar vegetation and habitat type as the application area.

B.2. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), and biological survey information, impacts to the following conservation significant fauna required further consideration.

Species name (Common name)	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus 11anksia naso (forest red-tailed black cockatoo)	Vulnerable	Y	Y	2.07	23	N/A
Falsistrellus mackenziei (western false pipistrelle)	Priority 4	Y	Y	4.76	3	N/A
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale)	Conservation Dependent	Y	Y	2.05	46	N/A

Species name (Common name)	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Pseudocheirus occidentalis (western ringtail possum)	Critically Endangered	Y	Y	2.04	70	N/A
Zanda baudinii (Baudin's cockatoo)	Endangered	Y	Y	2.07	91	N/A
Zanda latirostris (Carnaby's cockatoo)	Endangered	Y	Y	8.47	2	N/A

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

Appendix C. Assessment against the clearing principles

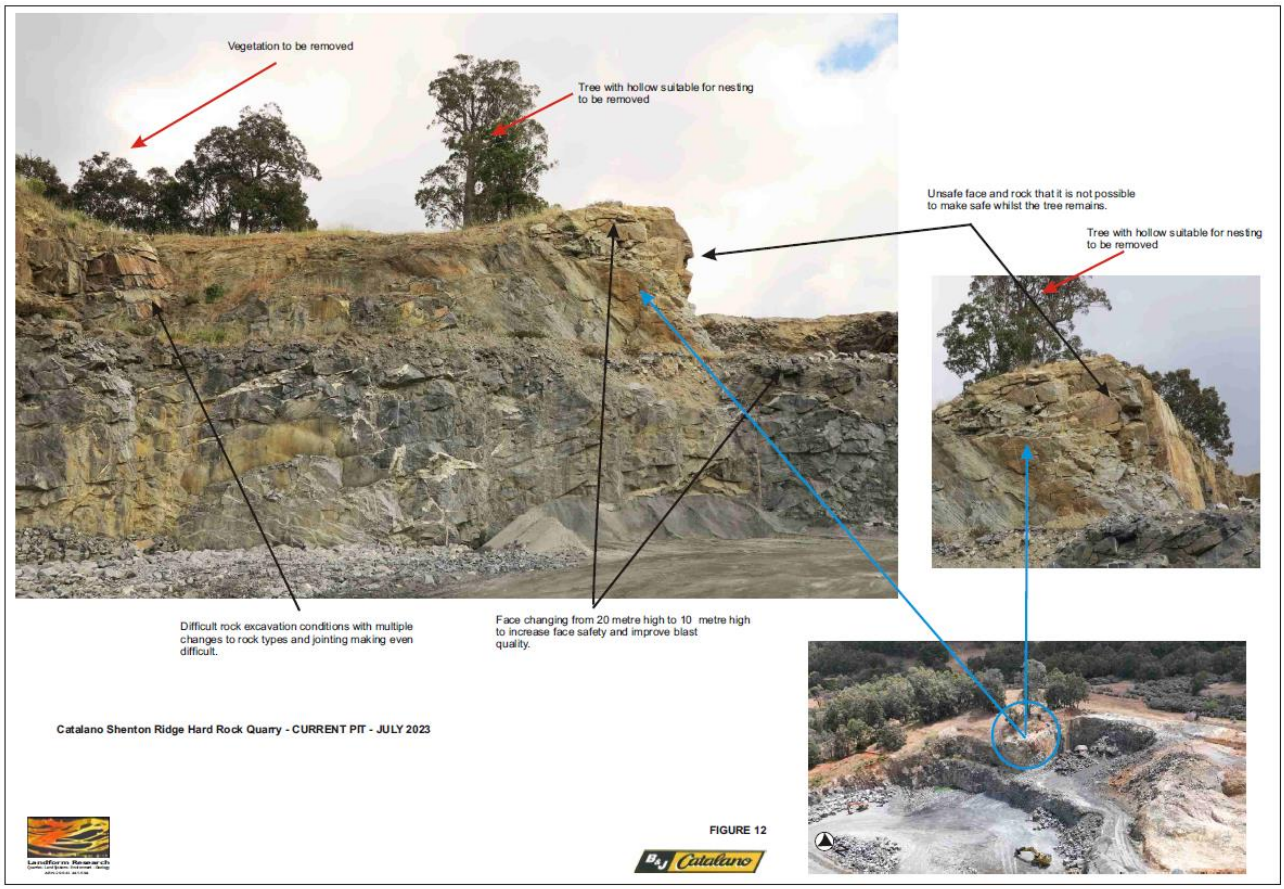
Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared consists predominately of marri and jarrah over pasture and does not represent an area of high biodiversity	Not likely to be at variance (As per CPS 7943/1)	No
Principle (b): *"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."* Assessment: The area proposed to be cleared contains significant habitat for all three threatened black cockatoo species.	At variance (As per CPS 7943/1)	Yes (Refer to Section 3.2.1, above.)
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain habitat for threatened flora species listed under the BC Act.	Not likely to be at variance (As per CPS 7943/1)	No
Principle (d): *"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."* Assessment: The area proposed to be cleared does not contain vegetation indicative of a threatened ecological community.	Not at variance (As per CPS 7943/1)	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of 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.	Not likely to be at variance (As per CPS 7943/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (h): *"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."* Assessment: Given the distance to the nearest conservation area is approximately 900 metres, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance (As per CPS 7943/1)	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: One minor, non-perennial watercourse is recorded adjacent to the application area, however, the proposed clearing will not impact on riparian vegetation or vegetation which provides a buffer to the vegetation along the watercourse	Not likely to be at variance (As per CPS 7943/1)	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are highly susceptible to wind, water erosion, nutrient export and subsurface salinity. 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.	Not likely to be at variance (As per CPS 7943/1)	No
Principle (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."* Assessment: One minor, non-perennial watercourse is recorded adjacent to the application area, however, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance (As per CPS 7943/1)	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: 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.	Not likely to be at variance (As per CPS 7943/1)	No

Appendix D. Site layout and photographs of the vegetation proposed to be cleared

Catalano Shenton Ridge Hard Rock Quarry - EXTRACTION AREA DRONE PHOTOGRAPH FROM THE SOUTH - 25 November 2022
PROPOSAL TO AMEND CLEARING PERMIT

FIGURE 3



Catalano Shenton Ridge Hard Rock Quarry - CURRENT PIT - JULY 2023

FIGURE 12

Appendix E. Offset calculator value justification (WA Environmental Offset Calculator, 2022)

WA Environmental Offsets Calculator

Rationale for scores used in the offset calculator

Black cockatoo foraging habitat

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Black cockatoo habitat	Black cockatoo foraging habitat supporting roosting and breeding individuals within the known extent of *Zanda latirostris* (Carnaby's black cockatoo), *Zanda baudinii* (Baudin's black cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
Type of environmental value	Species (Flora/Fauna)	Black cockatoo foraging habitat
Conservation significance of environmental value	Rare/Threatened Species - Endangered	Carnaby's and Baudin's cockatoo are listed as endangered under the BC Act and EPBC Act, so have used the highest conservation ranking.
Landscape level value impacted	Yes/No	No
Significant impact		
Description	Black cockatoo habitat	Black cockatoo foraging habitat supporting roosting and breeding individuals within the known distribution all three black cockatoo species
Significant impact (hectares)	0.323	Remaining vegetation yet to be cleared under CPS 7943/1
Quality (scale)	7	Biological surveys of the application area indicate the vegetation is in a Completely degraded (Keighery, 1994) condition. Primary foraging species are present (Marri and Jarrah), water sources are within close proximity, previous evidence of foraging within the application area and known roosting and breeding habitat is within close proximity.
Rehabilitation credit		
N/A	N/A	
Offset – Conservation and revegetation of 0.84 hectares		
Description	0	Revegetation of 0.84 hectares of native vegetation within Lot 501 on Deposited Plan 26892 that provides habitat values for black cockatoo foraging
Proposed offset (area in hectares)	0.84	0.84 hectares of native vegetation.
Current quality of offset site	1	The vegetation within the offset site is in a completely degraded (Keighery, 1994) condition
Future quality WITHOUT offset	1	The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years.
Future quality WITH offset	5	Revegetation (direct planting and seeding) within the site is expected to increase the condition of the vegetation to good (Keighery, 1994) condition
Time until ecological benefit (years)	17	It is expected to take 15 years for the vegetation to be established and to provide habitat values for black cockatoo foraging and another two years for a

Calculation	Score (Area)	Rationale
		conservation covenant to be placed over the vegetation.
Confidence in offset result (%)	80	There is a moderate level of confidence that the revegetation will meet the completion criteria of the revegetation plan
Duration of offset implementation (maximum 20 years)	20	The offset site will be protected in perpetuity.
Time until offset site secured (years)	3	It is expected that it will take one year for the revegetation to be planted and two years for a conservation covenant to be placed over the offset site.
Risk of future loss WITHOUT offset (%)	15	The site is currently zoned as rural
Risk of future loss WITH offset (%)	5	A conservation covenant will be placed over the offset site, thus the risk of loss is considered to be low.
Offset ratio (Conservation area only)	N/A	N/A
Landscape level values of offset?	N/A	N/A

Black cockatoo breeding habitat

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Suitable black cockatoo nesting tree	Application area contains one additional tree with a suitable breeding hollow that has previously been used by black cockatoos.
Type of environmental value	Species (Flora/Fauna)	Supporting breeding habitat for all three species of black cockatoos.
Conservation significance of environmental value	Rare/Threatened Species - Endangered	Carnaby's and Baudin's cockatoo are listed as endangered under the BC Act and EPBC Act, so have used the highest conservation ranking.
Landscape level value impacted	yes/no	No
Significant impact		
Description	Black cockatoo habitat	Available breeding habitat was identified within the application area.
Significant impact (hectares)		Removal of one tree containing hollow suitable for black cockatoos.
Number	1	Removal of one tree containing hollow suitable for black cockatoos.
Rehabilitation credit		
N/A	N/A	
Offset – Artificial hollows		
Description	Artificial hollow installation	Two artificial hollows will be installed within the areas cross hatched red within Lot 501 on Deposited Plan 26892
Proposed offset (area in hectares)	N/A	

Calculation	Score (Area)	Rationale
Current quality of offset site	1	The current offset area cross-hatched in red has 13 artificial nesting hollows, none which have been used by black cockatoos.
Future quality WITHOUT offset	1	The current offset area cross-hatched in red has 13 artificial nesting hollows, none which have been used by black cockatoos
Future quality WITH offset	2.27	2 artificial hollows will be installed, monitored and maintained within the areas cross hatched in red
Time until ecological benefit (years)	1	Artificial hollows will be installed prior to the next breeding season
Confidence in offset result (%)	80	80% confidence that with an adequate installation and maintenance, the artificial hollows will be successful.
Duration of offset implementation (maximum 20 years)	N/A	
Time until offset site secured (years)	N/A	
Risk of future loss WITHOUT offset (%)	N/A	
Risk of future loss WITH offset (%)	N/A	
Offset ratio (Conservation area only)	N/A	
Landscape level values of offset?	N/A	

Appendix F. 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.

Condition	Description
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 G. Sources of information

G.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)
- 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)

G.2. References

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B & J Catalano (2024a) *Bunbury outer ring road supporting information CPS 7943/3*, received 15 February 2024 (DWER Ref: DWERDT912707)

B & J Catalano (2024b) *Black cockatoo tree supporting information CPS 7943/3*, received 7 February 2024 (DWER Ref: DWERDT901486)

B & J Catalano (2024c) *Applicant provides DEMIRS report into unsafe pit CPS 7943/3*, received 28 March 2024 (DWER Ref: DWERDT926880)

B & J Catalano (2024d) *Applicant provides Extractive Industry Licence from the Shire of Harvey CPS 7943/3*, received 4 June 2024 (DWER Ref: DWERDT958711)

B & J Catalano (2024e) *Applicant provides a Revegetation Plan for the offset for CPS 7943/3*, received 1 July 2024 (DWER Ref: DWERDT970323)

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