



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7943/1
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 on attached Plan 7943/1.
- 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 3 January 2024.

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 – inspect suitable black cockatoo nesting trees

- (a) Immediately prior to clearing the *suitable black cockatoo nesting tree*, a *fauna specialist* shall inspect the *suitable black cockatoo nesting tree* to confirm whether it is occupied by Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) or forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).
- (b) Where the *suitable black cockatoo nesting tree* is identified as being occupied, the Permit Holder shall ensure that no clearing of, or within 10 metres of, the *suitable black cockatoo nesting tree* occurs until a *fauna specialist* has verified that the *suitable black cockatoo nesting tree* is no longer occupied by Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) or forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

8. Fauna management – artificial black cockatoo nest hollows

- (a) Prior to clearing the *suitable black cockatoo nesting tree*, the Permit Holder shall install three artificial black cockatoo nest hollows within the combined areas hatched red on attached Plan 7943/1.
- (b) The artificial black cockatoo nest hollows must be designed and placed in accordance with the guidelines provided in Schedule 1.
- (c) The artificial black cockatoo nest hollows must be monitored and maintained in accordance with the guidelines provided in Schedule 2, for a period of at least ten years.

9. Revegetation – mitigation

- (a) Within 12 months of the completion of clearing under this Permit, the Permit Holder must establish *Corymbia calophylla* and *Eucalyptus marginata* trees within an area of Lot 501 on Deposited Plan 26892, Roelands equivalent in size to that cleared.
- (b) The Permit Holder must monitor the survival of the trees established under condition 9(a) of this Permit at least once every 12 months for the remaining term of this Permit.
- (c) Where monitoring required by condition 9(b) of this Permit identifies that less than one live *Corymbia calophylla* or *Eucalyptus marginata* tree occurs per 100 metres squared 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 one tree occurs per 100 metres squared of the area established; and
 - (ii) undertake remedial actions such as weed control or fencing to increase the likelihood of survival of the established trees.

PART III – RECORD KEEPING AND REPORTING

10. Records to be kept

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

- (a) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the date(s) that the area was cleared;
 - (iii) the size of the area cleared (in hectares); and
 - (iv) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit.
- (b) In relation to fauna management pursuant to condition 7 of this Permit:
 - (i) the time(s) and date(s) of inspection(s) of the *suitable black cockatoo nesting tree* by the *fauna specialist*;
 - (ii) a description of the *fauna specialist* inspection methodology employed;

- (iii) the species name of any fauna determined by the *fauna specialist* to be occupying the *suitable black cockatoo nesting tree*;
 - (iv) where the *suitable black cockatoo nesting tree* is determined by the *fauna specialist* to be occupied by Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus 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.
 - (v) the time and date that the *suitable black cockatoo nesting tree* was cleared.
- (c) In relation to fauna management pursuant to condition 8 of this Permit:
- (i) the date(s) the artificial black cockatoo nest hollows were installed;
 - (ii) the locations where the artificial black cockatoo nest hollows were installed recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iii) a photo of each artificial black cockatoo nest hollow as installed;
 - (iv) a description of how the design and placement of each artificial black cockatoo nest hollow was determined based on the requirements of condition 8(b) of this Permit;
 - (v) the dates the artificial black cockatoo nest hollows were monitored;
 - (vi) a description of the monitoring methodology employed for each monitoring event;
 - (vii) a description of the monitoring observations for each monitoring event;
 - (viii) the dates the artificial black cockatoo nest hollows were maintained; and
 - (ix) a description of the maintenance activities undertaken for each maintenance event.
- (d) In relation to revegetation pursuant to condition 9 of this Permit:
- (i) the boundaries of the area where the *Corymbia calophylla* and *Eucalyptus marginata* trees were established, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the size of the area (in hectares) where the *Corymbia calophylla* and *Eucalyptus marginata* trees were established;
 - (iii) the date the *Corymbia calophylla* and *Eucalyptus marginata* trees were established;
 - (iv) the number of *Corymbia calophylla* and *Eucalyptus marginata* trees established;
 - (v) the dates of each monitoring event required by condition 9(b) of this Permit;
 - (vi) the density of the surviving *Corymbia calophylla* and *Eucalyptus marginata* trees recorded for each monitoring event;
 - (vii) the date(s) any *Corymbia calophylla* or *Eucalyptus marginata* trees were re-established in accordance with condition 9(c)(i) of this Permit;
 - (viii) the number of *Corymbia calophylla* and *Eucalyptus marginata* trees re-established on each date;
 - (ix) the date(s) any remedial actions were taken in accordance with condition 9(c)(ii) of this Permit; and
 - (x) 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

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

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

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 *Wildlife Conservation Act 1950*; and

suitable black cockatoo nesting tree means the *Corymbia calophylla* tree located at the geographic coordinates -33.30205, 115.90235 (decimal degrees) (Universal Transverse Mercator coordinates – 397810E 6314689N Zone 50) that contains a hollow suitable to be utilised for nesting by Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) or forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

3 December 2018

Schedule 1

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

Artificial hollows for Carnaby's cockatoo



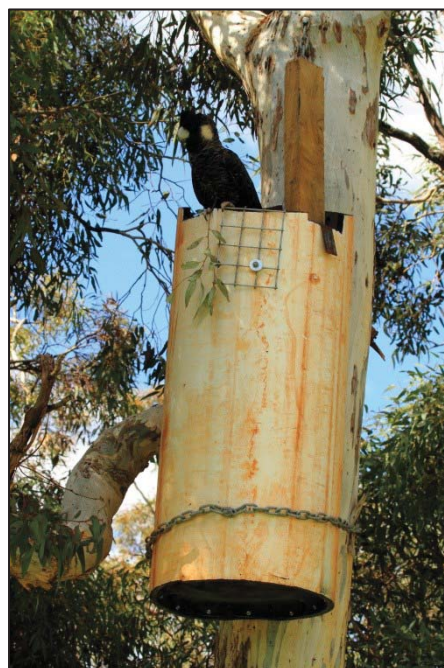
How to design and place artificial hollows for Carnaby's cockatoo

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

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

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

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



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

Walls

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

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

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

Base

The base of the artificial hollow must be;

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

Do not use:

- Saw dust or fibre products that will retain moisture.

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



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

Entrance

The entrance of the artificial hollow must;

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

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

Ladder

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

The ladder must be;

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

Do not use:

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

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

Sacrificial chewing posts

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

The sacrificial chewing posts must:

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

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



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

Photo by Rick Dawson

Mountings

The artificial hollows must be mounted such that:

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

Placement

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

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

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

Artificial hollows to be placed in trees require:

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

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

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

Safety

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

Maintenance and monitoring

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

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

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



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



Example fixing for artificial hollow
Photo by Christine Groom

Acknowledgements

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

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

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

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

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

Schedule 2

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

Artificial hollows for Carnaby's cockatoo



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

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

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

Monitoring should be undertaken in order to detect:

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



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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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



Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

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

Acknowledgements

This information sheet is a joint initiative of Birdlife Australia, the Western Australian Museum and the Department of Parks and Wildlife. Many individuals have contributed to its preparation. The updated version was compiled by Rick Dawson (Department of Parks and Wildlife) with assistance from Denis Saunders.

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Plan 7943/1

115°54'0"E

115°54'30"E

115°55'0"E

33°17'0"S

33°17'0"S

33°17'30"S

33°17'30"S

33°18'0"S

33°18'0"S








115°54'0"E

115°54'30"E

115°55'0"E

Legend

-  Roads
-  Areas approved to clear
-  Areas subject to conditions
-  Cadastre, Land Tenure
-  Local Government Authorities

Landgate_Subscription_ImageryWANow

RGB

-  Red: Band_1
-  Green: Band_2
-  Blue: Band_3



Mathew Gannaway

3/12/2018

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



GDA 94 Zone 50

1:15,000



GOVERNMENT OF WESTERN AUSTRALIA
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This report has been prepared to fulfil the requirements of an accredited environmental assessment process between the Commonwealth and State governments, pursuant to a bilateral agreement established under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report is set out in three parts:

- Part 1: Application and site details;
- Part 2: Assessment against matters of national environmental significance (pursuant to the EPBC Act); and
- Part 3: Assessment against the clearing principles (pursuant to the Western Australian *Environmental Protection Act 1986* (EP Act)). Appeal rights pursuant to section 101A of the EP Act are relevant to this section of the report.

Part 1: Application and site details

1. Application details

1.1. Permit application details

Permit application No.:	CPS 7943/1
EPBC Reference:	2017/8085
Permit type:	Purpose Permit

1.2. Applicant details

Applicant's name:	B. & J. Catalano Pty Ltd
Application received date:	10 January 2018

1.3. Property details

Property:	Lot 501 on Deposited Plan 26892, Roelands
Local Government Authority:	Shire of Harvey

1.4. Application

Clearing Area (hectares)	No. Trees	Method of Clearing	Purpose category:
1.6		Mechanical Removal	Extractive industry

1.5. EP Act decision on application

Decision:	Granted (for 1.2 hectares only)
Decision date:	3 December 2018
Reasons for decision:	<p>The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the <i>Environmental protection Act 1986</i>. The proposed clearing of 1.6 hectares of native vegetation was determined to be 'at variance' to principle (b) and 'not at variance' or 'not likely to be at variance' to the remaining clearing principles.</p> <p>A risk of unacceptable impacts to black cockatoos was identified being the loss of a tree with a hollow showing evidence of nesting use. In response, the applicant amended the application to the proposed clearing of 1.2 hectares of native vegetation within a revised application area, avoiding the tree with evidence of nesting use. The assessment against principle (b) was subsequently reconsidered and determined to be 'may be at variance'.</p> <p>It is considered that the proposed clearing of 1.2 hectares of native vegetation will result in the following impacts:</p> <ul style="list-style-type: none"> • loss of 1.2 hectares of black cockatoo foraging habitat; and • loss of a tree with a hollow suitable for black cockatoo nesting but with no evidence of use. <p>The Delegated Officer noted that environmental impacts have been avoided through modifications to the application area.</p> <p>The Delegated Officer determined that:</p> <ul style="list-style-type: none"> • Re-establishment of black cockatoo foraging and nesting habitat values on the property in accordance with a revegetation condition ensures no net loss of such habitat. The temporary loss of habitat is not likely to be significant noting the extent of similar habitat remaining in the local area including within Wellington National Park which measures approximately 17,500 hectares. • The loss of a tree with a hollow suitable for black cockatoo nesting (but with no evidence of use) can be mitigated through the installation of three artificial nest hollows in nearby remnant vegetation containing known nesting sites. There is a risk that the hollow could commence being used by black cockatoos prior to clearing but this risk can be mitigated through requiring a pre-clearing inspection and preventing clearing whilst in use. <p>Accordingly the Delegated Officer decided to grant a clearing permit for 1.2 hectares subject to black cockatoo management conditions, a revegetation condition, and standard avoid/minimise, record keeping and reporting conditions.</p>

2. Site Information

Clearing Description

The application submitted was for the clearing of up to one hectare of native vegetation within Lot 501 on Deposited Plan 26892, Roelands for the purpose of extraction. The application area is made up of two portions of Lot 501 (Figure 1). The southern portion measures 8.4 hectares and is where extraction is proposed. The northern portion measures 8.3 hectares and is where processing of the extracted material is proposed.

The majority of the application area is not covered by native vegetation. Upon review of aerial imagery it was determined that the actual area of native vegetation applied to clear is 1.6 hectares. This is based upon measuring the area of a tree as the area covered by the drip line of the tree consistent with regulation 5 subclause 3 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

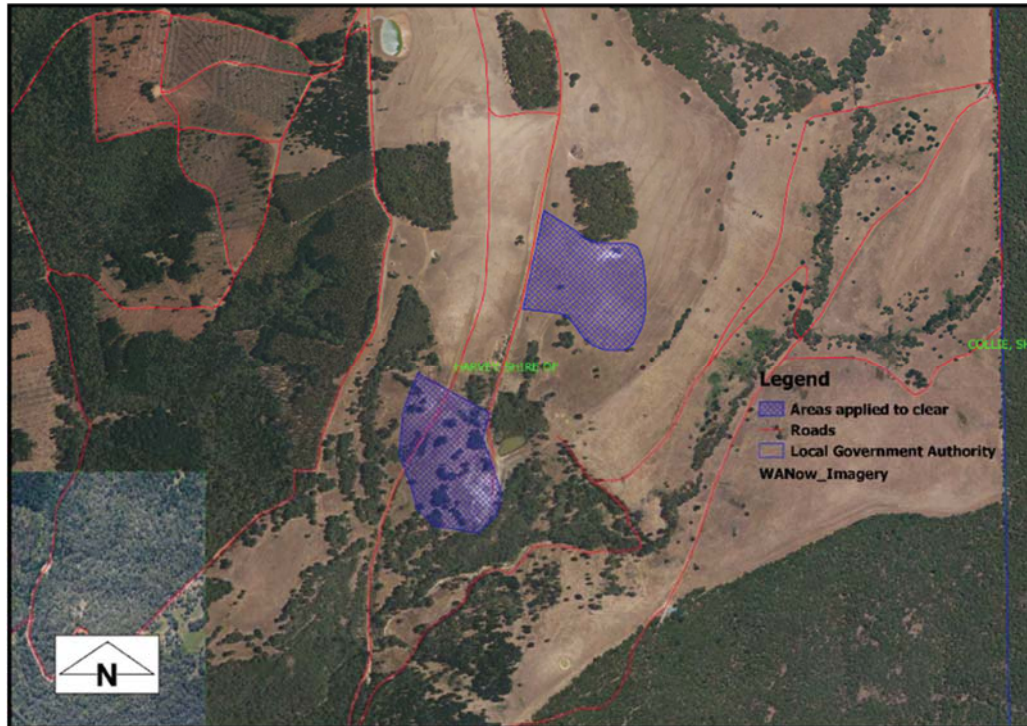


Figure 1. Map of application area.

Vegetation Description

The application area is mapped as the following two vegetation complexes:

- Dwellingup D1: Open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones (Government of Western Australia, 2018b); and
- Lowdon Lo: 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 raphiophylla* on valley floor in the humid zone (Government of Western Australia, 2018b).

Based on information provided by the applicant, the application area predominantly consists of marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*) over pasture grasses.

Vegetation Condition

The application area is considered to be in a Completely Degraded condition, described as; no longer intact, completely/almost completely without native species (Keighery, 1994).

Soil type

Northern Area (processing area): Loamy gravels and Duplex sandy gravels with some Deep sandy gravels, Shallow gravels, deep sands and loams.

Southern Area (extraction area): Friable red-brown loamy earths, Brown loamy earths, Brown deep loamy duplexes and Loamy gravels.

Comment

The local area considered in the assessment of this application is defined as a 10 kilometre radius measured from the perimeter of the application area.

Part 2: Assessment against matters of national environmental significance

3. Assessment of application against Matters of National Environmental Significance

Background

Lot 501 is located at 820 Coalfields Road, Roelands in the Shire of Harvey, approximately 24 kilometres east of Bunbury. The applicant has excavated crushed laterite duricrust and gravel from Lot 501 for a number of years and wishes to expand its operations by re-opening a small hard rock quarry near the gravel operations. There is a small hard rock quarry on site that will be re-opened and extended. The proposed hard rock quarry is proposed to extract 50,000 to 100,000 tonnes of hard rock per year (B. & J. Catalano, 2013).

The application area consists of two areas, one for processing and one for extraction. The majority of the 1.6 hectares of native vegetation within the application area occurs in the southern portion (extraction) with the northern portion (processing) only containing three marri trees. Both areas are considered to be in a completely degraded (Keighery, 1994) condition, predominantly consisting of marri and jarrah trees over pasture grasses.

The pit and the processing area have been selected to be low in the landscape, below the ridge lines to provide screening from the closest dwellings (2.3 kilometres away) (B. & J. Catalano, 2013).

Description of controlling provisions

On 15 December 2017, the proposal was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the following controlling provisions; Listed Threatened Species and Communities. The proposed action was considered likely to have a significant impact on Carnaby's cockatoo (*Calyptorhynchus latirostris*) listed as endangered under the EPBC Act, and on forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and Baudin's cockatoo (*Calyptorhynchus baudinii*) both listed as vulnerable under the EPBC Act.

It is noted that since this time, Baudin's cockatoo's conservation status has been amended to endangered under the EPBC Act. Under section 158A of the EPBC Act, an approval process decision is not affected by listing events that happen after a controlled action decision.

Carnaby's cockatoo

Currently, the overall population trend for the Carnaby's cockatoo is one of decline due to the loss and fragmentation of habitat as a result of clearing of native vegetation (Saunders, 1990; Johnstone and Storr, 1998; Saunders and Ingram, 1998; Garnett et al., 2011). Carnaby's cockatoo is endemic to the south-west of Western Australia. Breeding takes place between late July and December and occurs mostly in the inland wheatbelt region of its distribution, in areas receiving between 300 and 750 millimetres of annual average rainfall (Saunders, 1974). During the non-breeding season (January to July) the majority of the birds move to the higher rainfall coastal regions of their range including the midwest coast, Swan Coastal Plain and south coast (Saunders, 1980; Saunders, 1990; Johnstone et al., 2011). There has been an apparent expansion in the breeding range to include areas further west and south since the middle of last century with a more rapid increase into the jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) forests of the south west (Johnstone and Storr, 1998; Johnstone et al., 2011). This expansion in breeding range is due to threatening processes such as clearing of breeding habitat and competition for suitable breeding hollows.

The Carnaby's cockatoo was once abundant in Western Australia. Since the late 1940s, the species has suffered a 30 per cent contraction in range, a 50 per cent decline in population, and between 1968 and 1990 disappeared from more than a third of its breeding range (Saunders, 1990; Johnstone and Storr, 1998; Saunders and Ingram, 1998; Garnett et al., 2011). Basic ecological theory, expert opinion and recent evidence, suggests that the remaining native and pine plantation foraging habitat on the Swan Coastal Plain is just sufficient to support the current population of Carnaby's cockatoo. Therefore, any reduction in the amount of food source will result in a reduction in the carrying capacity of the region and therefore, a decline in the population of Carnaby's cockatoo.

Carnaby's cockatoo preferred habitat is remnant native eucalypt woodlands, especially those of salmon gum (*Eucalyptus salmonophloia*) and wandoo (*Eucalyptus wandoo*), and in shrubland or kwongan heathland dominated by plants of the Proteaceae family. It also occurs in forests containing marri, jarrah, karri (*Eucalyptus diversicolor*) and tuart (*Eucalyptus gomphocephala*) (Parks and Wildlife, 2013).

Carnaby's cockatoo nests in large hollows in tall, living or dead eucalypts. It nests most commonly in smooth-barked wandoo and salmon gum, but have also been recorded breeding in red morrell (*Eucalyptus longicornis*), York gum (*Eucalyptus loxophleba*), tuart, flooded gum (*Eucalyptus rudis*), swamp yate (*Eucalyptus occidentalis*), gimlet (*Eucalyptus salubris*) and marri, and are said to nest in any species of eucalypt with a suitable hollow (Parks and Wildlife, 2013).

The Carnaby's cockatoo recovery plan (Parks and Wildlife, 2013) summarises habitat critical to the survival of Carnaby's cockatoo as:

- the eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and

- in the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources.

The recovery plan also states that success in breeding is dependent on the quality and proximity of feeding habitat within 12 kilometres of nesting sites (Parks and Wildlife, 2013). Along with the trees that provide nest hollows, the protection, management and increase of this feeding habitat that supports the breeding of Carnaby's cockatoo is a critical requirement for the conservation of the species (Parks and Wildlife, 2013).

Forest red-tailed black cockatoo

The forest red-tailed black cockatoo is endemic to the south-west humid and sub-humid zones of south west Western Australia and inhabits jarrah, karri and marri forests receiving more than 600 millimetres of annual average rainfall (DEC, 2008).

The forest red-tailed black cockatoo occurs in one population of approximately 15,000 individuals and are known to nest in the large hollows of marri, jarrah and karri (Johnstone and Kirkby, 1999).

The recovery plan for the species identifies the main threats to the forest red-tailed black cockatoo as illegal shooting, habitat loss through land clearing, nest hollow shortage and competition from other species (DEC, 2008).

Baudin's cockatoo

Baudin's cockatoo is endemic to a 2,000 kilometre area of the humid and sub-humid zones of south-west Western Australia and is generally contained within the 750 millimetre isohyet of average annual rainfall. This species is locally resident, but at the end of the breeding season (January), the birds move away from the breeding area and form flocks that move in response to changing food resources (DEC, 2008).

Baudin's cockatoo mainly feeds on the seeds of marri and nest in mature trees such as marri, karri, jarrah and wandoo in the lower south-west of Western Australia (DEC, 2008).

This species has declined over more than 50 per cent of its range over the past 50 years. The principal cause of the decline in range was clearing of the eastern margins of the forests for agriculture and the current primary threat to the population is illegal shooting. The recovery plan also identifies nest hollow shortage and competition from other species as threats to the species (DEC, 2008).

Summary of Impacts

The application area is located within the modelled distribution for all three species of black cockatoo including the known breeding range of Carnaby's cockatoo and the predicted breeding range of Baudin's cockatoo (Commonwealth of Australia, 2012).

Landform Research were commissioned by the applicant to undertake a Flora and Vegetation Assessment of the application area (Landform Research, 2017). A Black Cockatoo Habitat Survey was also undertaken by Tony Kirkby on 24 April 2017. The entire application area represents foraging habitat for black cockatoos. Recent and old feeding residues from Baudin's cockatoo was observed beneath three marri trees (Kirkby, 2017).

The habitat survey identified 22 trees (20 marri and two jarrah) with a diameter at breast height of 500 millimetres or greater (Kirkby, 2017). Two of the marri trees contained hollows suitable for nesting by black cockatoos. One of the hollows showed signs of recent use (i.e. chewing) by black cockatoos (Kirkby, 2017). As feeding residues from Baudin's cockatoo were located within the survey area it is possible that the well chewed marri hollow may belong to this species (Kirkby, 2017).

The Carnaby's cockatoo recovery plan notes that critical habitat for this species includes eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding (Parks and Wildlife, 2013).

The recovery plan also acknowledges that decline in Carnaby's cockatoo populations, to date has been brought about primarily by the extensive clearing of nesting and feeding habitat during the 20th century. Continuing threats mostly relate to loss of habitat due to clearing or degradation, competition for nest sites, and loss of individuals due to illegal activities, collisions with motor vehicles and disease (Parks and Wildlife, 2013).

The Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan lists habitat critical for the survival of these species as all marri, karri (*Eucalyptus diversicolor*) and jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall. The recovery plan lists one of the main threatening processes to these species as nest hollow shortage and competition for available nest hollows (DEC, 2008).

The proposed clearing will result in the following impacts to black cockatoos:

- loss of 1.6 hectares of foraging habitat; and
- loss of two trees with hollows suitable for nesting, one of which shows evidence of use.

Based on information in the recovery plans the removal of a known breeding tree would be inconsistent with the objectives of the recovery plans.

Public consultation

The following information has been provided by the applicant in a document titled 'Lot 501 Coalfields Highway Hard Rock Quarry, Economic costs and benefits' (B. & J. Catalano, 2018):

- B. & J. Catalano have worked hard with the local community to ensure they are informed of the application and establishment of the project. Unfortunately some adjoining parties are not in support of the quarry.
- During the assessment processes the quarry was reviewed by the Shire of Harvey over a two year period, during which there have been many meetings with the local authority and all relevant Government Departments. The Quarry was approved by the State Administrative Tribunal and complies with all Government Policies and Guidelines.
- The neighbours and members of the public had input into the mediation for the considerations at the State Administrative Tribunal. They also had input into the consideration by the Environmental Protection Authority (EPA), made representations to the Shire of Harvey and Council on a number of occasions and input into the Appeals on the Works Approval and EPA considerations.
- There have been a number of onsite meetings and many contacts between the company and the adjoining neighbours, who have had access to all information related to the operations. Informal and formal communication with the neighbours continues, even though some are not supportive of the quarry approval or construction.
- There have been extensive expert studies completed for the quarry, including water management, blast management, noise compliance and management, dust management and flora and vegetation studies, plus consideration of the use of the site by fauna. Independent advice from consultants has been used in all phases of the application and construction of the quarry.
- The Department of Mines, Industry Regulation and Safety have inspected the site and construction on a number of occasions and have approved the Project Management Plan and have registered the site under the SRS Safety System.
- The Shire of Harvey is to consider issuing an Extractive Industry Licence (EIL) during the June 2018 Council meetings.

The clearing permit application was advertised on the DWER website on 20 February 2018 with a 21 day submission period. No public submissions have been received in relation to this application.

Avoidance, mitigation and offset

Avoidance and mitigation

The following information was provided by the applicant in a document titled 'Lot 501 Coalfields Highway Hard Rock Quarry, Economic costs and benefits' (B. & J. Catalano, 2018):

- The pit must be located where the resource is located and in a situation where the least amount of impact on amenity and the environment is made.
- The pit site was selected on granite outcrop at the site of an existing quarry to minimise land disturbances and vegetation clearing. The pit footprint was selected on pasture with scattered trees to minimise the number of trees to be impacted, low in the landscape to minimise offsite impacts.
- The location exits directly to the south of Coalfields Highway in a strategic location to minimise transport distances to markets and therefore greenhouse gas emissions.
- The processing and stockpile area was selected in an area of pasture with only three unhealthy regrowth trees to be disturbed. The site is located upstream of the large naturalised dam to provide the best opportunity for water management with water from the site having to travel over one kilometre to the next downstream property.
- The disturbance areas lie outside any watercourse or wetland and are serviced by an existing farm access road to minimise further disturbance. The same access roads and entrance are used for an existing gravel operation on site.
- By basing the pit on the old quarry in an area of granite outcrop the amount of overburden to be removed and relocated and landform disturbance is minimised.
- Both the pit and processing/stockpile footprints are located low in the landscape to provide the most visual landform screening and at the same time minimising disturbance of the landform.

The following mitigation measures were provided to the Department of the Environment and Energy (DotEE) in the EPBC referral:

- Over two hectares of marri and jarrah trees are to be planted;
- Ten cockatoo nesting boxes are proposed to be placed in forest on Lot 501;
- All other tree vegetation on Lot 501 is to be protected.

On 6 August 2018, DWER wrote to the applicant and in relation to the tree with a well chewed hollow advised:

"The Department of the Environment and Energy (DotEE) has advised that, under section 139 of the EPBC Act, the Minister (or his delegate) must not act inconsistently with a recovery plan or threat abatement plan and therefore DotEE is unlikely to support the removal of this tree."

The applicant was invited to provide additional advice addressing the matter including information on whether the application area could be modified to avoid the removal of the tree.

On 23 August 2018, the applicant responded to DWER providing a revised application area that avoids 13 of the 22 trees identified as having a diameter at breast height of 500 millimetres or greater (Landform Research, 2018a). The tree with a well chewed hollow is one of the 13 trees avoided. The revised application area is shown as Figure 2.

The other tree with a suitable nesting hollow (but no evidence of use) is still proposed to be cleared but it is considered that the loss of this tree can be mitigated through the installation of artificial nest hollows. DotEE implements a 3:1 ratio when requiring artificial hollows and therefore three artificial hollows are required in this case. The artificial hollows can be installed in other

remnant vegetation on the same property. Two other remnants on the property are known to contain at least four black cockatoo nesting sites (Kirkby, 2017).

There is a risk that the hollow could commence being used prior to clearing but this risk can be mitigated through requiring a pre-clearing inspection of the hollow and preventing clearing whilst in use.



Figure 2. Map of revised application area (blue outline). Southwest corner of extraction area removed.

It is considered that the risk of impacts to black cockatoos (including the loss of foraging habitat) can be further mitigated through the re-establishment of marri and jarrah trees over an area equivalent in size to that of the area of vegetation cleared.

On 21 September 2018, the applicant provided a copy of the EIL obtained from the Shire of Harvey (Landform Research, 2018b). The EIL is valid for a period of 5 years with options to extend given the life span of the operation is estimated to be 20 years. Noting this, it is considered that replanting of marri and jarrah trees should occur elsewhere on the property rather than within the application area post extraction. This is to reduce the length of time required to re-establish habitat given the application area may remain open for extraction for an extended period.

Offset

It is considered that an offset is not required due to the following:

- the avoidance of the tree with a well chewed hollow;
- the ability to impose a condition requiring replacement of the suitable nest hollow (with no evidence of use) with three artificial nest hollows; and
- the ability to impose a condition requiring the future re-establishment of black cockatoo foraging and nesting habitat values on the property through replanting of marri and jarrah trees. The temporary loss of habitat is not considered to be significant noting the extent of similar habitat remaining in the local area including within Wellington National Park which measures approximately 17,500 hectares.

Other relevant considerations

The following information was provided by the applicant in a document titled 'Lot 501 Coalfields Highway Hard Rock Quarry, Economic costs and benefits' (B. & J. Catalano, 2018):

Set up costs

A simple business case was conducted to demonstrate the cost impact of setting up the quarry by B. & J. Catalano. The estimated costs of the equipment, application costs, legal costs and quarry and process area set up are shown in the below table.

During the setup phase B. & J. Catalano will require environmental consultants, supervisors and management, machine operators, fitters, blasting experts, road construction experts etc.

The total number of employees expected to be employed during this phase will be around 10 full time employees until operation commences. Please see Table 1 below for estimated costs.

Table 1. Set up costs

Estimated Set up costs	
Crusher, Screeners, conveyors, stackers	\$ 6,600,000
Loaders x 2	\$ 1,000,000
haul truck	\$ 300,000
weigh bridge	\$ 100,000
Huts	\$ 50,000
Bunding around areas	\$ 200,000
Haul road construction	\$ 75,000
Entrance upgrade	\$ 500,000
Applications and permits including legal fight	\$ 200,000
Pre extraction blast set up	\$ 50,000
Rock breaker	\$ 25,000
Generators	\$ 50,000
Supervisor vehicle	\$ 50,000
Fencing	\$ 50,000
Excavator 80 tonne	\$ 1,000,000
Total	\$ 10,250,000

Operating costs

The quarry will likely have four full time employees and will also require corporate maintenance with stores and purchasing, accounting, haulage of products, sales as well as compliance and reporting and repairs and maintenance. There will also be costs involved with fuel and explosives.

Estimated operation costs for years 1-5 will be approximately \$5.9 million. This will be a total setup and operation cost of around \$16 million for the first 5 years of operation.

Years 6-10 B. & J. Catalano expect an increase in operational costs by around 3 per cent, this will take the cost of operation for these years to around \$6.1 million dollars.

Years 11-15 a further 3 per cent increase will take the cost of operation to \$6.3 million dollars. Please see Table 2 below for estimated operational costs.

Table 2. Operating costs

Operating costs for years 1-5	Set up costs	Total costs	Tonnes to be produced
\$5,911,877.00	\$10,250,000	\$16,161,877.00	500,000.00
Operating costs for years 6-10		Total costs	Tonnes to be produced
\$6,089,233		\$6,089,233	500,000.00
Operating costs for years 11-15		Total costs	Tonnes to be produced
\$6,271,910		\$6,271,910	500,000.00

Employment opportunities

B. & J. Catalano have estimated the following employees will be full time:

- Four quarry operators
- One quarry manager
- One sales person approximately 50 per cent of their time
- Two – three truck drivers
- One maintenance person for approximately 75 per cent of their time
- Stores and purchasing will be completed from B. & J. Catalano's main office
- Accounts and invoicing will be completed from B. & J. Catalano's main office
- Quality testing will be conducted via local consultants
- Environmental will be conducted via consultants
- End product users will also employ people to create their products.

Applicant's Environmental History

Best Practice Certification Pty Ltd has assessed B. & J. Catalano Pty Ltd as complying with AS/NZS ISO 14001:2015 – Environmental Management System.

Part 3: Assessment against the clearing principles

4. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Proposed clearing is not likely to be at variance to this Principle

The applicant proposes to clear up to 1.6 hectares of native vegetation within Lot 501 on Deposited Plan 26892, Roelands. The application area is parkland cleared and consists predominantly of marri and jarrah over pasture.

Five priority flora species have been recorded within the local area. Given that the application area consists of scattered marri and jarrah trees over pasture grasses, the application area is not likely to support priority flora. DBCA South West Region has advised that the application area will not impact on any flora or vegetation that is currently listed as threatened (DBCA, 2018a).

As discussed in Principle (b) eight terrestrial fauna species listed as specially protected under the *Wildlife Conservation Act 1950* (WC Act) have been recorded within the local area. Of these eight species, the application area contains suitable habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and Baudin's cockatoo (*Calyptorhynchus baudinii*) (collectively known as black cockatoos) (DBCA, 2007-). Two marri trees were observed to contain hollows suitable for black cockatoos. One of these had a well chewed hollow showing signs of recent use by black cockatoos (Kirkby, 2017).

The closest mapped priority ecological community is the 'Banksia Dominated Woodlands of the Swan Coastal Plain', which has been identified approximately six kilometres west of the application area. This community is listed as Priority 3 by the State and is listed as Endangered under the EPBC Act. The application area is not representative of this community.

Given the completely degraded (Keighery, 1994) condition of the application area, the application area is not considered to contain a high level of biological diversity. Therefore the proposed clearing is not likely to be at variance to this 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 indigenous to Western Australia.

Proposed clearing is at variance to this Principle

Eight terrestrial fauna species, listed as specially protected under the WC Act have been recorded within the local area, being; Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), numbat (*Myrmecobius fasciatus*), chuditch (*Dasyurus geoffroi*), woylie (*Bettongia penicillata* subsp. *ogilbyi*), western ringtail possum (*Pseudocheirus occidentalis*) and quokka (*Setonix brachyurus*) (DBCA, 2007-).

Carnaby's cockatoo and Baudin's cockatoo are listed as endangered and forest red-tailed black cockatoo is listed as vulnerable under the Commonwealth EPBC Act. Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests or in isolated trees (Commonwealth of Australia, 2012). These species nest in hollows in live or dead trees of karri, marri, wandoo, tuart, salmon gum, jarrah, flooded gum, York gum, powder bark, bullich and blackbutt (Commonwealth of Australia, 2012).

On 24 April 2017 Mr Tony Kirkby undertook a black cockatoo habitat survey of the application area. This survey identified approximately 20 marri and jarrah trees with a diameter at breast height of 500 millimetres or greater. Two of these marri trees contain hollows suitable for nesting by black cockatoos. One contained a hollow with a suitable entrance size but showed no signs of use. The other tree had a well chewed hollow showing signs of recent use by black cockatoos (Kirkby, 2017).

Black Cockatoos have a preference for foraging habitat that includes jarrah and marri woodlands and forest heathland and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp. and *Grevillea* sp. (Commonwealth of Australia, 2012). Both recent and old feeding residues from Baudin's cockatoos was observed beneath three marri trees (Kirkby, 2017). As the feeding residue was from Baudin's cockatoo it was speculated that the well chewed hollow is likely to be used by this species (Kirkby, 2017).

Although the application area contains suitable foraging habitat for black cockatoos, the local area contains approximately 50 per cent native vegetation, the majority of which is held in conservation tenure and therefore the scattered trees within the application area are not likely to provide significant foraging habitat for black cockatoos.

The application area consists of scattered marri and jarrah trees over pasture grasses. As the application area is devoid of mid and understory species, the application area is not likely to contain significant habitat for ground dwelling species such as the numbat, chuditch, woylie and quokka.

The primary habitat for the western ringtail possum is long un-burnt remnants of peppermint (*Agonis flexuosa*) woodlands. No peppermint trees were recorded within the application area and therefore the application area is not likely to contain significant habitat for this species.

An ecological linkage, defined by the South West Regional Ecological Linkage (SWREL) Report (Molloy et al., 2009) is mapped approximately one kilometre west of the application area (running north-south) and another is mapped approximately two kilometres south of the application area (running east-west).

The SWREL report (Molloy et al.,2009) defines an ecological linkage as “A series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape”. The east-west ecological linkage follows the Collie River and the north-south linkage generally follows larger remnants of native vegetation. Given the location and condition of the application area, the vegetation under application is not likely to be critical for the maintenance of either of these linkages.

Given the presence of a hollow showing evidence of breeding by black cockatoos, the proposed clearing is at variance to this Principle.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Proposed clearing is not likely to be at variance to this Principle

No rare flora species have been recorded within the local area.

Given that the application area consists of scattered marri and jarrah trees over pasture grasses, the application area is not likely to support rare flora.

The proposed clearing is not likely to be at variance to this 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.

Proposed clearing is not at variance to this Principle

The closest mapped TEC is the ‘Banksia Dominated Woodlands of the Swan Coastal Plain’, which has been identified approximately six kilometres west of the application area. This ecological community has a dominant *Banksia* component, which includes at least one of four key species—*Banksia attenuata* (candlestick banksia), *B. menziesii* (firewood banksia), *B. prionotes* (acorn banksia) and/or *B. ilicifolia* (holly-leaved banksia) (DotEE, 2016). The application area does not contain Banksia species and is therefore not representative of this community.

Given the above the proposed clearing is not at variance to this 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.

Proposed clearing is not likely to be at variance to this Principle

The application area is located within the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This IBRA bioregion has approximately 53 per cent of its pre-European vegetation extent remaining (Government of Western Australia, 2018a).

The application area is mapped as Matisse vegetation complexes Dwellingup (D1) and Lowdon (Lo) which retain approximately 87 and 37 per cent of their pre-European extents, respectively (Government of Western Australia, 2018b).

Aerial imagery and available GIS datasets indicate that the local area retains approximately 50 per cent native vegetation.

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

Given the above statistics, the application area is not considered to be located in an area that has been extensively cleared.

Although the application area is a significant remnant (given the presence of an identified breeding hollow), the application area is not located within an area that has been extensively cleared and therefore, the proposed clearing is not likely to be at variance to this Principle.

Table 3. Vegetation extent remaining statistics (Government of Western Australia, 2018a; Government of Western Australia, 2018b)

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (proportion of pre-European extent) (%)
IBRA bioregion:					
Jarrah Forest	4,506,660	2,406,939	53.4	1,673,353	37.1
Vegetation complex:					
Dwellingup D1	208,491	180,683	86.7	171,201	82.1
Lowdon Lo	17,288	6,335	36.6	2,722	15.7

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is not likely to be at variance to this Principle

A minor, non-perennial watercourse is located approximately 100 metres south of the southern application area. Two tributaries to this watercourse flow north, to the east and west of the southern application area. At their closest point the tributaries are approximately 50 metres from the southern application area. One of the tributaries intersect the footprint area of the northern application area, however this area does not contain native vegetation.

The closest wetland to the application area is a Resource Enhancement wetland, located approximately 600 metres north of the application area.

Although a tributary to a minor, non-perennial watercourse intersects the northern application area, no native vegetation is growing in association with this area.

Given the above, the application area is not likely to be growing in, or in association with, an environment associated with a watercourse or wetland. Therefore, the proposed clearing is not likely to be at variance to this Principle.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Proposed clearing is not likely to be at variance to this Principle

The Department of Primary Industries and Regional Development (DPIRD) has mapped the majority of the application area as consisting of soil type 'Hester ironstone gravel ridges Phase'. This soil type is described as 'Loamy gravels and Duplex sandy gravels with some Deep sandy gravels, Shallow gravels, deep sands and loams' (DPIRD, 2017).

This soil type is well drained and is therefore not likely to be prone to water erosion or waterlogging. Gravelly soils are also not prone to wind erosion.

Given the soil type present and that the application area consists of scattered trees over pasture grasses, the proposed clearing is not likely to lead to appreciable land degradation. Therefore the proposed clearing is not likely to be at variance to this 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.

Proposed clearing is not likely to be at variance to this Principle

The closest conservation area to the application area is Wellington National Park which is located approximately one kilometre east. State Forest 15 is also located within the local area. At its closest point State Forest 15 is 6.6 kilometres from the application area.

Given the distance to the closest conservation area, the proposed clearing is not likely to have an impact on the environmental values of this area. Therefore the proposed clearing is not likely to be at variance to this 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.

Proposed clearing is not likely to be at variance to this Principle

A minor, non-perennial watercourse is located approximately 100 metres south of the southern application area. Two tributaries to this watercourse flow north, to the east and west of the southern application area. At their closest point the tributaries are approximately 50 metres from the southern application area. One of the tributaries intersect the footprint area of the northern application area, however this area does not contain native vegetation. No vegetation associated with watercourses is proposed to be cleared, and given the topography of the land the proposed clearing is not likely cause deterioration in the quality of surface water.

Groundwater salinity within the application area is mapped at less than 500-1,000 total dissolved solids, milligrams per litre. This level of groundwater salinity is classified as 'marginal'. Given this level and that the proposed clearing consists of scattered trees, the proposed clearing is not likely to increase groundwater salinity.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Proposed clearing is not likely to be at variance to this Principle

As discussed in Principle (g) the predominant soil type mapped within the application area is gravel. Gravelly soils are well drained and therefore the proposed clearing is not likely to increase the incidence or intensity of flooding.

The proposed clearing is not likely to be at variance to this principle.

Planning instruments and other relevant matters.

The proposed quarry was referred to the EPA in 2015. On 23 March 2015 the EPA decided not to assess the proposal under Part IV of the EP Act. The EPA's decision was appealed but the appeal was subsequently dismissed by the Minister for Environment.

DWER granted a Works Approval (W5828/2015/1) to the applicant for the crushing and screening of up to 100,000 tonnes of material per year on 6 February 2018. The Works Approval was appealed but the appeal was subsequently dismissed by the Minister for Environment. The Works Approval is valid until 6 February 2021. DWER is currently assessing a License application for the quarry.

Lot 501 is zoned 'General Farming' under the Shire of Harvey town planning scheme.

On 18 October 2016 the Shire of Harvey refused B & J Catalano's application for development approval (to extract granite from Lot 501). A decision to grant development approval under the Greater Bunbury Region Scheme and the Shire of Harvey District Planning Scheme No 1 was made by the State Administrative Tribunal on 31 March 2017. The applicant has since obtained an EIL from the Shire of Harvey (Landform Research, 2018b).

The application area falls within the Collie River Irrigation District surface water area, proclaimed under the *Rights in Water and Irrigation Act 1914*. DWER South West Region has advised that "in context of water resources management/protection no objections to the clearing have been identified" (DWER, 2018).

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 20 February 2018 with a 21 day submission period. No public submissions have been received in relation to this application.

5. Consideration of variances following applicant's submissions / further information

As outlined in Section 3 'Avoidance, mitigation and offset', the applicant proposed a number of mitigation measures including, but not limited, to:

- over two hectares of marri and jarrah trees are to be planted; and
- ten cockatoo nesting boxes are proposed to be placed in forest on Lot 501.

On 23 August 2018 the applicant also amended the application area to avoid 13 of the 22 trees identified as having a diameter at breast height of 500 millimetres or greater (Landform Research, 2018a). The amended size of clearing proposed is 1.2 hectares of native vegetation. The tree with a well chewed hollow is one of the 13 trees avoided. Noting the amendment, it is considered that the proposed clearing requires reassessment against Principle (b).

One tree with a suitable black cockatoo nesting hollow is still proposed to be cleared but no evidence of use of the hollow was identified and therefore it is considered that the proposed clearing is now 'may be at variance' to Principle (b). It is considered that the loss of this tree can be mitigated through the installation of an artificial nest hollow. DotEE implements a 3:1 ratio when requiring artificial hollows and therefore three artificial hollows are required in this case. The artificial hollows can be installed in other remnant vegetation on the same property. Two other remnants on the property are known to contain at least four black cockatoo nesting sites (Kirkby, 2017).

There is a risk that the hollow could commence being used prior to clearing but this risk can be mitigated through requiring a pre-clearing inspection of the hollow and preventing clearing whilst in use.

It is considered that the risk of impacts to black cockatoos (including the loss of foraging habitat) can be further mitigated through the re-establishment of marri and jarrah trees over an area equivalent in size to that of the area of vegetation cleared.

The WA Environmental Offsets Guidelines states that environmental offsets address significant environmental impacts that remain after on-site avoidance and mitigation measures have been undertaken. The WA Environmental Offsets Policy states that environmental offsets are not appropriate in all circumstances and will not be applied to minor environmental impacts.

It is considered that an offset is not required due to the following:

- the avoidance of the tree with a well chewed hollow;
- the ability to impose a condition requiring replacement of the suitable nest hollow (with no evidence of use) with artificial nest hollows; and
- the ability to impose a condition requiring the future re-establishment of black cockatoo foraging and nesting habitat values on the property through replanting of marri and jarrah trees. The temporary loss of habitat is not considered to be significant noting the extent of similar habitat remaining in the local area including within Wellington National Park which measures approximately 17,500 hectares.

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GIS Databases:

- Department of Biodiversity Conservation and Attractions, Tenure
- Groundwater salinity
- Hydrography
- NLWRA, Current Extent of Native Vegetation
- SAC Bio Datasets
- Soils, Statewide
- Topographic contours