



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 6560/3
Permit Holder:	Shire of Donnybrook - Balingup
Duration of Permit:	From 7 May 2016 - 7 May 2036

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 gravel extraction and road maintenance and upgrade.

2. Land on which clearing is to be done

Grimwade Road reserve (PIN 11505012), Wilga West
Lot 13610 on Deposited Plan 28106 (State Forest 29), Grimwade, Wilga West and Noggerup

3. Area of Clearing

The Permit Holder must not clear more than 12.54 hectares of native vegetation within the combined areas cross-hatched yellow on attached Plan 6560/3a, Plan 6560/3b, Plan 6560/3c and Plan 6560/3d.

4. Clearing not Authorized

This Permit does not authorise the Permit Holder to clear within areas crosshatched red on attached Plan 6560/3b and Plan 6560/3d.

5. 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.

6. Period of clearing authorised

The Permit Holder shall not clear any native vegetation after 7 May 2026.

7. Type of clearing

This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for those activities under the *Local Government Act 1995* or any other written law.

PART II – MANAGEMENT CONDITIONS

8. Avoid, minimise, and reduce 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:

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

9. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

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

10. Fauna management – Phascogale tapoatafa subsp. tapoatafa (southern brush-tailed phascogale).

- (a) Prior to undertaking any clearing authorised under this Permit within the area cross-hatched yellow Plan 6560/3b and Plan 6560/3d, the Permit Holder must engage a *fauna specialist* to inspect trees identified as *habitat tree(s)* within the ‘Level 1 Fauna Survey – Grimwade Road and Scrubbird Gravel Pit, Wilga West, 19 December 2014’ and ‘Report of a Level 1 Fauna Survey at the proposed expanded Grimwade - Palmer Gravel Pit, February 2016’, for *evidence* of current or past breeding use by southern brush-tailed phascogale.
- (b) Where a *habitat tree(s)* is identified with no *evidence* of current or past use by the southern brush-tailed phascogale that tree must only be cleared immediately after the inspection.
- (c) Any *fauna habitat tree* with *evidence* of current breeding use by southern brush-tailed phascogale under condition 10(a) must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under condition 10(b).

11. Fauna management - black cockatoo habitat

- (a) Prior to undertaking any clearing authorised under this Permit within the area cross-hatched yellow on Plan 6560/3b and Plan 6560/3d, the Permit Holder must engage a *fauna specialist* to inspect trees identified as *black cockatoo habitat tree* within ‘Level 1 Fauna Survey – Grimwade Road and Scrubbird Gravel Pit, Wilga West, 19 December 2014’ and ‘Report of a Level 1 Fauna Survey at the proposed expanded Grimwade - Palmer Gravel Pit, February 2016’, for *evidence* of current or past breeding use by black cockatoos species listed below:
 - (i) *Calyptorhynchus latirostris* (Carnaby’s cockatoo);
 - (ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo); and
 - (iii) *Calyptorhynchus baudinii* (Baudin’s cockatoo).
- (b) Where a *black cockatoo habitat tree* with no *evidence* of current or past use by black cockatoo species is identified in accordance with condition 11(a), that tree must only be cleared immediately after the inspection.
- (c) Where a *black cockatoo habitat tree* is identified within the areas cross-hatched yellow on Plan 6560/3b and Plan 6560/3d and that tree shows *evidence* of current or past breeding use by black cockatoo species under condition 11(a), and clearing of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.
- (d) Any *black cockatoo habitat 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 11(c).
- (e) For each *black cockatoo habitat tree* identified in condition 11(a) that cannot be avoided, the permit holder must install an artificial black cockatoo nest hollow.
- (f) Each artificial black cockatoo nesting hollow required by condition 11(e) must be installed prior to commencement of any clearing activities otherwise authorised under this permit.
- (g) The artificial black cockatoo nest hollow(s) required by condition 11(e) of this permit must:
 - (i) be installed within Lot13610 on Plan 28106, within the areas cross-hatched green on Plan 6560/3b and Plan 6560/3d;
 - (ii) be designed and placed in accordance with the specifications detailed in Schedule 1; and

- (iii) be monitored and maintained in accordance with the specifications detailed in Schedule 2, for a period of at least ten years.
- (iv) Prior to *prescribed burning* within Lot 13610 on Plan 28106, rake *leaf litter* away from the central trunk to the *drip line*, of trees installed with replacement nest hollows in the area crosshatched green as defined in condition 11(g)(i).
- (v) Replace nest hollows destroyed by fire within the areas cross-hatched green on Plan 6560/3b and Plan 6560/3d; before the next proceeding breeding season as directed in conditions 11(g)(i) and 11(g)(ii).

12. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) at an *optimal time* following the completion of works under this Permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared under this Permit, including:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land; and
 - (ii) ripping the ground on the contour to remove soil compaction; and
 - (iii) ripping the pit floor and contour batters within the extraction site; and
 - (iv) laying the vegetative material and topsoil retained under condition 12(a) on the cleared area(s) that are no longer required for the purpose for which they were cleared under this Permit.
- (c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 12(b) of this Permit:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 12(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) Where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 12(c)(ii) of this permit, the Permit Holder shall repeat condition 12(c)(i) and 12(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) Where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 12(c)(i) and (ii) of this permit, that determination shall be submitted for the *CEO's* consideration. If the *CEO* does not agree with the determination made under condition 12(c)(ii), the *CEO* may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 12(c)(ii).

PART III – RECORD KEEPING AND REPORTING

13. Records must 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 species composition, structure and density of the cleared area;
 - (ii) 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;
 - (iii) the date that the area was cleared; and
 - (iv) the size of the area cleared (in hectares).
- (b) In relation to southern brush-tailed phascogale fauna management pursuant to condition 10.
 - (i) the time(s) and date(s) of inspection(s) of the suitable *habitat tree(s)* by the *fauna specialist*;
 - (ii) a description of the inspection methodology employed by the *fauna specialist*;

- (iii) the species name of any fauna determined by the *fauna specialist* to be occupying the suitable *habitat tree(s)*;
- (iv) where the suitable *habitat tree* is determined by the *fauna specialist* to be occupied by southern brush-tailed phascogale:
 - a. the time and date that it was determined to be no longer occupied; and
 - b. a description of the *evidence* by which it was determined to be no longer occupied; and
- (c) In relation to and black cockatoo management pursuant to condition 11.
 - (i) the time(s) and date(s) of inspection(s) of the suitable *black cockatoo habitat tree(s)*; by the *fauna specialist*;
 - (ii) a description of the inspection methodology employed by the *fauna specialist*;
 - (iii) the species name of black cockatoos species determined by the *fauna specialist* to be occupying the suitable *black cockatoo habitat tree*;
 - (iv) where the suitable *black cockatoo habitat tree* is determined by the fauna specialist to be occupied by a black cockatoos species:
 - a. the time and date that it was determined to be no longer occupied; and
 - b. a description of the *evidence* by which it was determined to be no longer occupied.
 - (v) Record the date of installation and location of each artificial black cockatoo nest hollow, installed under condition 11(e), 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 and;
 - (vi) the time(s) and date(s) of inspection(s) and/or replacement of hollows pursuant to schedule 2.
- (d) In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 12 of this Permit:
 - (i) the location of any areas *revegetated* and *rehabilitated*, 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) a description of the *revegetation* and *rehabilitation* activities undertaken;
 - (iii) the size of the area *revegetated* and *rehabilitated* (in hectares);
 - (iv) the species composition, structure and density of *revegetation* and *rehabilitation*, and
 - (v) a copy of the environmental specialist's report.

14. 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 13 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 or financial year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before calendar of each year.
- (c) Prior to 7 February 2036, the Permit Holder must provide to the *CEO* a written report of records required under condition 13 of this Permit where these records have not already been provided under condition 14(a) of this Permit.

DEFINITIONS

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

black cockatoo habitat trees means trees that have a diameter, measured at 150 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Eucalyptus salmonophloia* or *Eucalyptus wandoo*) that contain hollows suitable for breeding by black cockatoo species.

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

direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.

drip line means the maximum extent of a tree canopy.

environmental specialist means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist.

evidence means 'of use'.

fauna specialist: means a person who holds a tertiary qualification specializing 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*.

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

habitat tree means trees that have a diameter, measured at 1.5 metres from the base of the tree, of 50 centimetres or greater, that contains or has the potential to develop hollows or roosts suitable for native fauna;

leaf litter means dead plant material fallen to the ground.

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;

optimal time means the period from April to June for undertaking *direct seeding*, and 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;

prescribed burning means the process of planning and applying fire to a predetermined area, under specific environmental conditions, to achieve a desired outcome.

regenerate/ed/ion means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing *mulch*;

rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area;

revegetate/ed/ion 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.

weed/s means any plant -

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



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

29 September 2021

SCHEDULE 1

How to design and place artificial hollows for Carnaby's cockatoo (Department of Parks and Wildlife, 2015)



Artificial hollows for Carnaby's cockatoo



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

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

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

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

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



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

Walls

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

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

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

Base

The base of the artificial hollow must be;

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

Do not use:

- Saw dust or fibre products that will retain moisture.

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



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

Entrance

The entrance of the artificial hollow must;

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

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

Ladder

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

The ladder must be;

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

Do not use:

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

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

Sacrificial chewing posts

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

The sacrificial chewing posts must:

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

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



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

Photo by Rick Dawson

Mountings

The artificial hollows must be mounted such that:

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

Placement

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

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

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

Artificial hollows to be placed in trees require:

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

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

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

Safety

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

Maintenance and monitoring

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

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

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



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



Example fixing for artificial hollow
Photo by Christine Groom

Acknowledgements

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

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

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

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

Further information

Last updated 28/04/2015

Contact fauna@dpaw.wa.gov.au or your local office of the Department of Parks and Wildlife

See the department's website for the latest information: www.dpaw.wa.gov.au

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SCHEDULE 2

How to monitor and maintain artificial hollows for Carnaby's cockatoo (Department of Parks and Wildlife, 2015)



Artificial hollows for Carnaby's cockatoo



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

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

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

Monitoring should be undertaken in order to detect:

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



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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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



Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

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

Acknowledgements

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

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

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

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

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

Further information

Last updated 28/04/2015

Contact fauna@dpaw.wa.gov.au or your local office of the Department of Parks and Wildlife

See the department's website for the latest information: www.dpaw.wa.gov.au

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CPS 6560/3 - Plan a

116°3'54.000"E

116°4'12.000"E

116°4'30.000"E

116°4'48.000"E

33°41'24.000"S

33°41'42.000"S

33°42'0.000"S

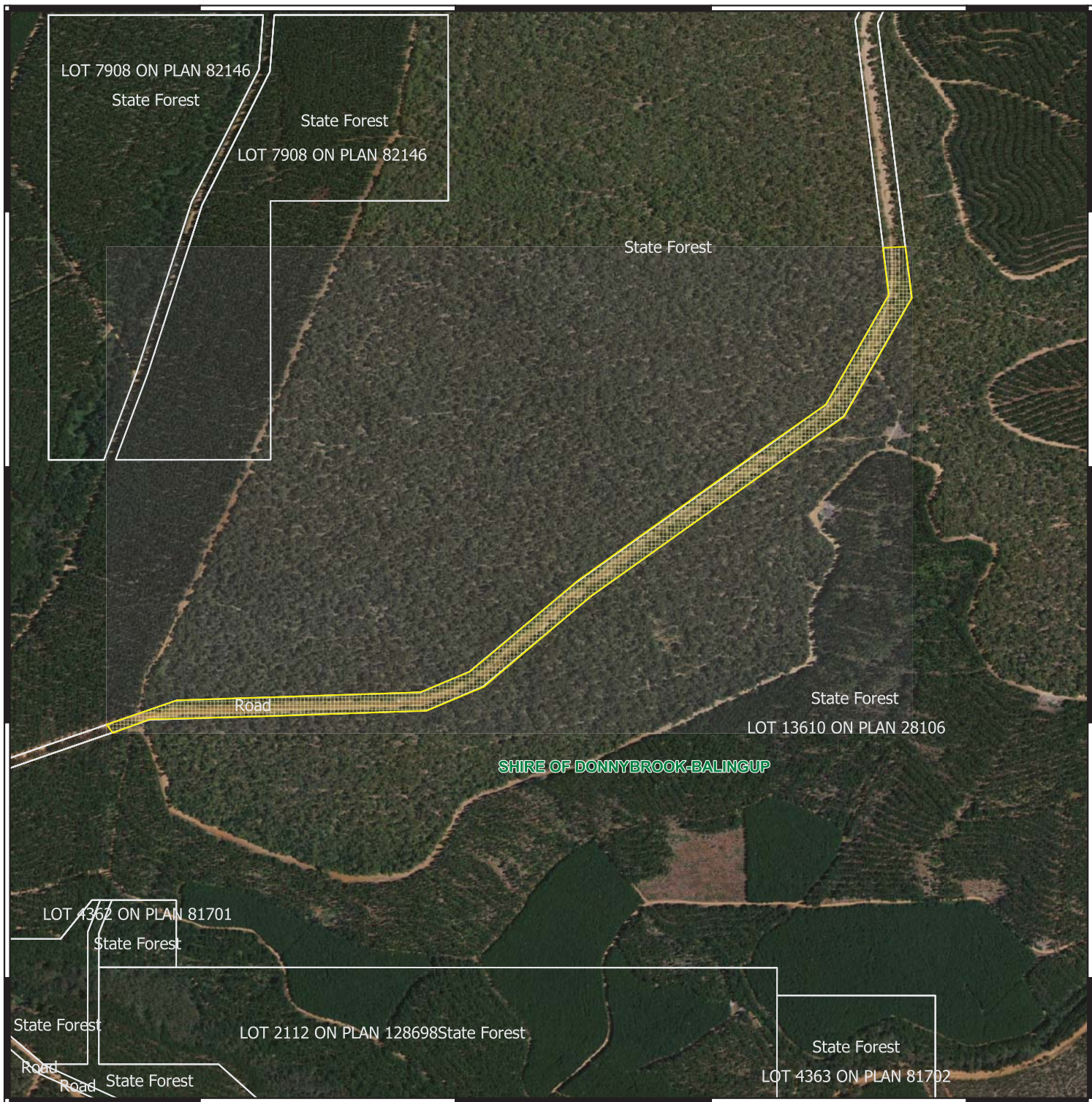
33°42'18.000"S

33°41'24.000"S

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33°42'0.000"S

33°42'18.000"S





116°3'54.000"E

116°4'12.000"E

116°4'30.000"E

116°4'48.000"E

CPS layers

-  CPS areas approved to clear
-  Local Government Authorities

Legend

-  Land Tenure




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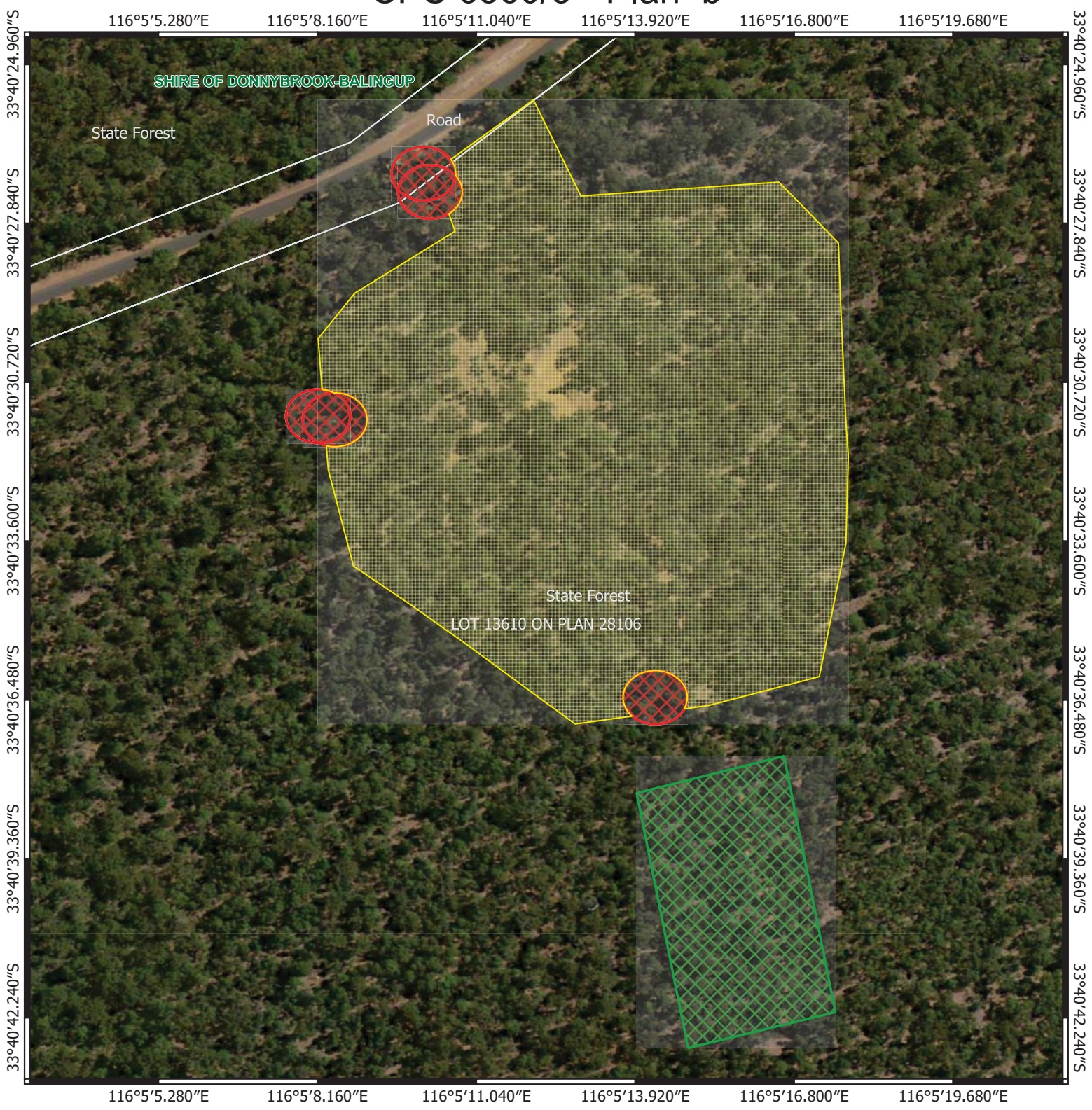
**GOVERNMENT OF
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MGA Zone 50
Geocentric Datum of Australia 1994

CPS 6560/3 - Plan b



CPS layers

- Areas subject to conditions
- Areas subject to conditions
- CPS areas approved to clear

base layers

- Local Government Authorities

Legend

- Land Tenure

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Environmental Protection Act 1986

CPS 6560/3 - Plan c



116°5'45.600"E 116°6'14.400"E 116°6'43.200"E 116°7'12.000"E 116°7'40.800"E




State Forest LOT 13610 ON PLAN 28106

116°5'45.600"E 116°6'14.400"E 116°6'43.200"E 116°7'12.000"E 116°7'40.800"E

CPS layers

-  CPS areas approved to clear
-  Local Government Authorities

Legend

-  Land Tenure



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Geocentric Datum of Australia 1994



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WESTERN AUSTRALIA**



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Environmental Protection Act 1986

CPS 6560/3 - Plan d


116°6'25.920"E 116°6'29.088"E 116°6'32.256"E 116°6'35.424"E 116°6'38.592"E 116°6'41.760"E



CPS layers

-  Areas subject to conditions
-  Areas subject to conditions
-  CPS areas approved to clear
-  Local Government Authorities

Legend

-  Land Tenure



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MGA Zone 50
Geocentric Datum of Australia 1994



**GOVERNMENT OF
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Environmental Protection Act 1986



1. Application details

1.1. Permit application details

Permit application No.: 6560/3
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Shire of Donnybrook Balingup

1.3. Property details

Property: Grimwade Road reserve (PIN: 11505012), Wilga West
Lot 13610 on Deposited Plan 28106 (State Forest 29), Grimwade, Wilga West and Noggerup
Local Government Authority: Shire of Donnybrook Balingup

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
4.8		Mechanical Removal	Road construction
7.74		Mechanical Removal	Extractive industry

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 29 September 2021
Reasons for Decision: This amendment has been made to extend the period of clearing for a further five years within Grimwade Road and Palmer and Scrubbird gravel pits within Lot 13610 on Plan 28106 (State Forest 29).

The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. It has been concluded that the findings from the previous assessments CPS 6560/1 and CPS 6560/2 are still relevant, with further consideration given to a review of federal government guidelines regarding the mitigation of impacts to Black cockatoo breeding habitat (Australian Government 2017).

Additional conditions have been imposed on the permit to mitigate impacts to Black cockatoo breeding habitat, as follows:

- Avoidance of eight trees that contain hollows suitable for Black cockatoo breeding, including a 15-metre buffer; and
- replacement hollows to be placed adjacent to the application area in State Forest to mitigate the loss of trees with suitable sized Black cockatoo hollows within the pit extraction area and not conditioned as above.

In determining to grant the clearing permit subject to the additional conditions, the Delegated Officer considered that the revised permit is more reflective of the importance placed on Black cockatoo breeding habitat.

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation association, 3: Medium forest; jarrah-marri (Shepherd et al. 2001).	Application CPS 6560/3 is to clear 12.54 hectares of native vegetation within Lot 13610 on Plan 28106 (State Forest 29) and Grimwade Road reserve (PIN 11505012) for the purpose of gravel extraction and road upgrade.	Excellent; Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).	The vegetation description and condition was determined via a site inspection undertaken by Department of Environment Regulation (DER) officers (DER, 2015), and from flora and vegetation surveys undertaken by Ecoedge (2014a) and Ecoedge (2016a).
Mattiske vegetation complexes: Catterick (CC1): Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Corymbia calophylla</i> mixed with <i>Eucalyptus patens</i> on slopes, <i>Eucalyptus rudis</i> and <i>Banksia littoralis</i> on valley floors in the		To	Four native vegetation units were recognised within Grimwade Road reserve (Plan 6560/2a and Plan 6560/2c) being:
		Completely Degraded: No longer intact;	

humid zone (Mattiske and Havel 1998).

Dwellingup (D1): Open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones (Mattiske and Havel 1998).

Grimwade (GR): Tall open forest to open forest of *Corymbia calophylla* - *Eucalyptus marginata* subsp. *marginata* with *Eucalyptus patens* on slopes and *Eucalyptus rudis* over some *Agonis flexuosa* on lower slopes in the humid zone (Mattiske and Havel 1998).

Hester (HR): Tall open forest to open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on lateritic uplands in perhumid and humid zones (Mattiske and Havel 1998).

Wingewelup (WG): Woodland of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on sandy-gravels on low divides in the subhumid zone (Mattiske and Havel 1998).

completely/almost completely without native species (Keighery 1994)

Vegetation unit A: Open forest of *Eucalyptus marginata* and *Corymbia calophylla* over *Banksia grandis* and *Persoonia longifolia* scattered low trees over a shrubland of *Acacia pulchella*, *Clematis pubescens*, (*Hakea amplexicaulis*), *Hibbertia commutata*, *H. cunninghamii*, *Macrozamia riedlei* and *Phyllanthus calycinus* over scattered herbs of *Lagenophora huegelii*, *Patersonia umbrosa*, *Pteridium esculentum* and *Tetrarrhena laevis* grass (*Mirbelia dilatata*, *Trymalium odoratissimum* and *Xanthorrhoea preissii* in damper areas) (Ecoedge 2014a).

Vegetation unit B1: Open forest of *Eucalyptus marginata* and *Corymbia calophylla* over *Banksia grandis*, *Persoonia longifolia* open low woodland over *Banksia dallanneyi*, *Hakea lissocarpha*, *Hibbertia hypericoides*, *Leucopogon capitellatus*, *Macrozamia riedlei*, *Phyllanthus calycinus*, and *Tetratheca hirsuta* over *Craspedia variabilis* and *Lagenophora huegelii* scattered Herbs (Ecoedge 2014a).

Vegetation unit B2: Open forest of *Eucalyptus marginata* and *Corymbia calophylla* over scattered low trees of *Banksia grandis* and *Persoonia longifolia* over *Acacia pulchella*, *Boronia spathulata*, *Bossiaea ornata*, *Hakea lissocarpha*, *Hibbertia commutata*, *H. cunninghamii*, *H. hypericoides*, *Phyllanthus calycinus*, *Xanthorrhoea gracilis* and *X. preissii* shrubland (Ecoedge 2014a).

Vegetation unit C: Open forest of *Eucalyptus rudis* and *E. patens* over scattered low trees of *Banksia littoralis* over *Acacia saligna*, **Rubus anglocandicans*, *Taxandria linearifolia* shrubland, *Pteridium esculentum* tall herbs and *Lepidosperma tetraquetrum* tall sedges (Ecoedge 2014a).

A flora and vegetation survey undertaken by Ecoedge (2016a) within the gravel pit adjacent to Grimwade Road reserve (Plan 6560/2b) identified one vegetation unit being: open forest of *Eucalyptus marginata* and *Corymbia calophylla* over low woodland of *Banksia grandis*, *Eucalyptus marginata* (regrowth) and *Persoonia longifolia* over open heath/low open heath of *Hibbertia amplexicaulis*, *H. hypericoides*, *Leucopogon capitellatus*, *L. propinquus*, *L. verticillatus*, *Macrozamia riedlei* and *Xanthorrhoea gracilis* over open herbland of *Pteridium esculentum* (dominant) and low herbs such as *Daucus glochidiatus*, *Lagenophora huegelii*, *Patersonia umbrosa* var. *xanthina*, *Stylidium amoenum* and *Trachymene pilosa* on gravel.

The application area within Scrubbird Road gravel extraction pit (Plan 6560/2d) is described as 'Open forest of *Eucalyptus marginata* and *Corymbia calophylla* over *Persoonia longifolia* scattered low trees over a shrubland of *Hibbertia commutata*, *H. cunninghamii*, *H. hypericoides*, *Leucopogon capitellatus*, *Macrozamia riedlei* and *Xanthorrhoea gracilis* over very open herbs of *Craspedia variabilis*, *Daucus glochidiatus*, *Pentapeltis peltigera*, *Stylidium androsaceum* and *Trachymene pilosa*' (Ecoedge 2014a).

3. Assessment of application against clearing principles

This assessment refers to the permit holder's application to amend clearing permit CPS 6560/2, as follows:

CPS 6560/2 Part 1, 5. Period of clearing authorised: The Permit Holder shall not clear any native vegetation after 7 May 2021.

In regard to the above, the Shire of Donnybrook Balingup (the Shire; Permit Holder), identified it was not possible to complete clearing in Grimwade Road, Palmer gravel pit and Scrubbird gravel pits before the current clearing expiration date on the permit. This would signify a significant loss of resources for the Shire. To mitigate this loss, the Shire has applied for an extension for a period of five years until 2026, for Grimwade Road, Palmer gravel pit and Scrub bird gravel pits.

The assessment against the clearing principles outlined in Schedule 5 of the *Environmental Protection Act 1986*, has not changed, and can be found in the Clearing Permit Decision Reports CPS 6560/1 and 6560/2. This assessment will address changes to federal government guidelines regarding the mitigation of impacts to Black cockatoo breeding habitat (Australian Government 2017), which have been subject to review since Clearing Permit CPS 6560/2 was granted

The recovery of Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Baudin's Cockatoo (*Calyptorhynchus baudinii*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), is of national importance. The clearing of any breeding habitat is highly likely to have a significant impact on the recovery of these species, and therefore mitigation measures are required to reduce the any likely impact (Australian Government 2017) to this habitat.

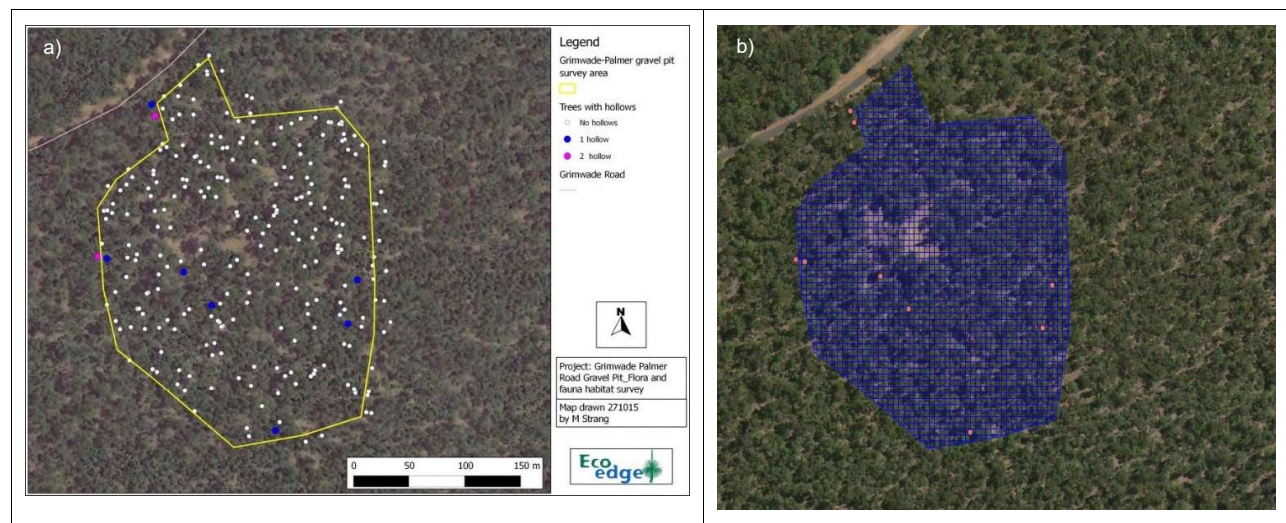


Figure 1, A) Coloured dots indicate trees with hollows and number of hollows for each tree requiring mitigation or avoidance within Grimwade Road, Palmer gravel pit (Ecoedge 2016b), b) Recent aerial imagery, with breeding habitat trees represented by pink dots. Image indicates only a small amount of gravel extraction has occurred since 2014 and all habitat trees have been avoided.

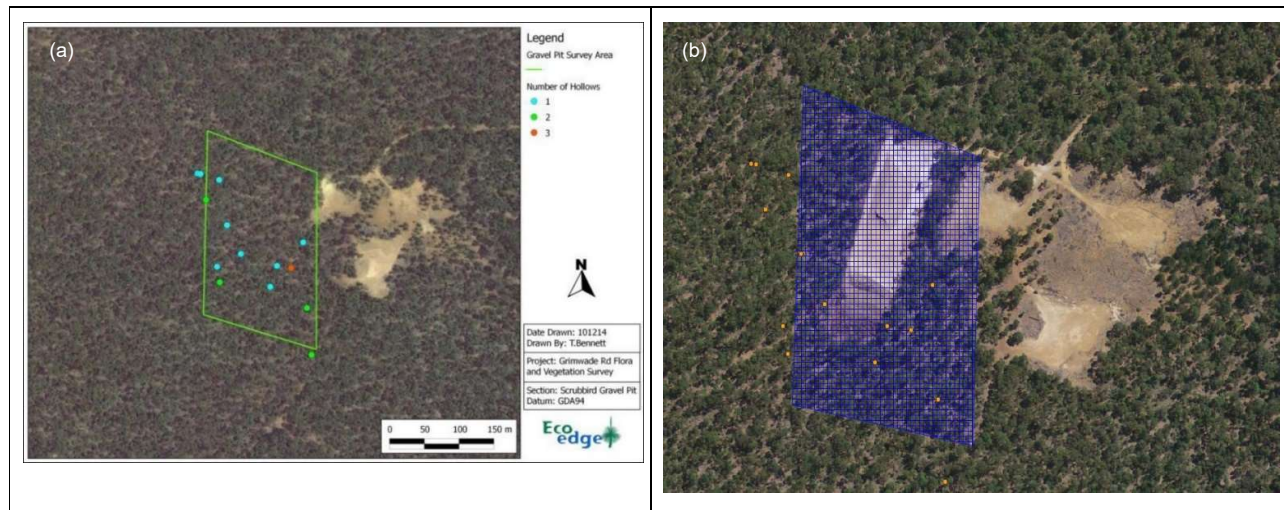


Figure 2, Coloured dots indicate trees with hollows requiring mitigation or avoidance within Scrubbird gravel pit (Ecoedge 2014b), b) Recent aerial imagery, with habitat trees represented by orange dots. Image indicates only a moderate amount of gravel extraction has occurred since 2014 and all habitat trees have been avoided. Note the application area, (a) was moved approximately 33 metres east after the ecoedge fauna survey was carried out.

Surveys carried out for the permit holder identified eight hollows within seven trees within the Grimwade Road gravel pit and 10 hollows in 6 trees within Scrubbird gravel pit (Ecoedge, 2014). These hollows were determined to be of a minimum size suitable for black cockatoo nesting. The majority of trees within both areas were jarrah, although a number of marri trees were also identified (Ecoedge, 2014b; 2015b). Both pits included trees with more than one Hollow (see Figure 1 and 2). All hollows identified as suitable for black cockatoo nesting will require mitigation or avoidance measures. Advice from DBCA (2020a) requested that the trees with recognised hollows should be retained and demarcated with a suitable temporary barrier erected 15 meters from the crown drip zone to provide protection from machine damage. In response to this request, the Shire advised that avoiding and preserving all hollow bearing trees is not possible due to area constraints and the low survival rate of isolated trees retained within extraction areas. As all of the above trees could not be retained, the Shire proposed to mitigate the loss of cockatoo nesting habitat with the provision of replacement hollows prior to the removal of habitat trees (Shire of Donnybrook Balingup, 2021). However, a further review of the location of hollow bearing trees identified eight trees within and adjacent to the Grimwade Road gravel pit and Scrubbird pit that could be avoided with a 15-metre buffer, as specified in DBCA advice above, and not restrict gravel extraction. The Shire agreed to retain the aforementioned trees. For the trees that could not be avoided, the Shire will replace potential nesting hollows with artificial replacements in the adjacent State Forest.

With avoidance measures in place, up to four hollows will require replacement in similar habitat adjacent to Grimwade Road gravel pit. Scrubbird gravel pit contained a higher number of trees with multiple hollows and may require up to 10 replacement hollows in similar habitat adjacent to the clearing. With the above avoidance and minimisation strategies employed, an extension of the period in which clearing can occur is not likely to have a significant impact on the availability of breeding habitat for Black cockatoos in the local context.

Planning instruments and other relevant matters.

The Shire's current extraction licence for Lot 13610 on Plan 28106 (State Forest 29) will expire in December 2021. However, the landowner, (Department of Biodiversity, Conservation and Attractions [DBCA]) has confirmed the above licence will be renewed until December 2026 (DBCA 2020b). The Shire has also been granted permission by DBCA (2021) to access land adjacent to gravel extraction area areas for the purpose of installing, maintaining, and monitoring, replacement cockatoo hollows for the period stated in permit CPS 6560/3.

The planning and other matters considered in the assessment have not changed and can be found within the decision reports for Clearing Permits CPS 6560/1 and CPS 6560/2.

4. References.

- Australian Government (2017), Department of Environment and Energy, *Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo (Endangered) Calyptorhynchus latirostris Baudin's Cockatoo (Vulnerable) Calyptorhynchus baudinii Forest Red-tailed Black Cockatoo (Vulnerable) Calyptorhynchus banksii naso*, accessed 05/08/2021.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2020a) *Regional advice from the South West Region for clearing permit application CPS 6560/3*, received 18 December 2020. Department of Biodiversity, Conservation and Attractions, Western Australia. (DWER Ref: DWERDT393935).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2020b) *Regional advice from the South West Region for clearing permit application CPS 6560/3*, received 02 November 2020. Department of Biodiversity, Conservation and Attractions, Western Australia. (DWER Ref: A1950198).
- Department of Biodiversity, Conservation and Attractions (DBCA) (2021) *Regional advice from the South West Region for clearing permit application CPS 6560/3*, received 14 September 2021. Department of Biodiversity, Conservation and Attractions, Western Australia. (DWER Ref: A2044986).
- Ecoedge (2014a) Report of a Level 1 Flora and Vegetation Survey – Grimwade Road and Scrubbird Gravel Pit. Western Australia. DER Ref: A1050990

- Ecoedge (2014b) Level 1 Fauna Survey – Grimwade Road and Scrubbird Gravel Pit, Wilga West. Western Australia. DER Ref: A1050987
- Ecoedge (2016a) Report of a Level 1 Flora and Vegetation survey at the Grimwade (Palmer) Gravel Pit. Western Australia. DER Ref: A1066405
- Ecoedge (2016b) Report of a Level 1 Fauna Survey at the proposed expanded Grimwade-Palmer Gravel Pit. Western Australia. DER Ref: A1066405
- Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2014. WA Department of Parks and Wildlife, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- Shire of Donnybrook Balingup (2021), *Supporting information for amendment to clearing permit application CPS 6560/2*, received 07 July 2021 December 2021 (DWER Ref: A2022459).