



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7473/1
Permit Holder:	Carbone Bros Pty Ltd
Duration of Permit:	29 August 2018 – 29 August 2029

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.

2. Land on which clearing is to be done

Lot 67 on Diagram 94273, Brunswick.

3. Area of Clearing

The Permit Holder must not clear more than 4.5 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 7473/1(a).

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.

PART II – MANAGEMENT CONDITIONS

5. 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:

- 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.

6. Dieback and weed control

When undertaking any clearing 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*:

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

7. Fauna management – habitat trees

- (a) Prior to undertaking clearing authorised under this Permit, the areas cross-hatched yellow on attached Plan 7473/1(a) shall be inspected by a *fauna specialist* who shall identify *habitat tree(s)* suitable to be utilised by the below fauna species:
 - (i) Carnaby’s cockatoo (*Calyptorhynchus latirostris*);
 - (ii) Baudin’s cockatoo (*Calyptorhynchus baudinii*);
 - (iii) Forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
 - (iv) South-western brush-tailed phascogale (*Phascogale tapoatafa* subsp. *wambenger*); and
 - (v) Chuditch (*Dasyurus geoffroii*).
- (b) Prior to undertaking clearing authorised under this Permit, any *habitat tree(s)* identified by condition 7(a) shall be inspected by a *fauna specialist* for the presence of south-western brush-tailed phascogale, chuditch, Carnaby’s cockatoo, forest red-tailed black cockatoo or Baudin’s cockatoo.
- (c) Immediately prior to undertaking any clearing authorised under this Permit, the Permit Holder shall engage a *fauna specialist* to relocate any south-western brush-tailed phascogale or chuditch identified under condition 7(b) of this Permit, in accordance with a fauna licence pursuant to Regulation 15 of the *Wildlife Conservation Regulations 1970*.
- (d) Where *habitat tree(s)* are identified as being utilised by Carnaby’s cockatoo, forest red-tailed black cockatoo or Baudin’s cockatoo under condition 7(b) of this Permit, the Permit Holder shall monitor the *habitat tree(s)* to determine when it is no longer in use for that breeding season and the chick(s) has fledged, as determined by the *fauna specialist* under condition 7(a) of this Permit.
- (e) The Permit Holder shall not clear a *habitat tree* identified as being utilised by Carnaby’s cockatoo, forest red-tailed black cockatoo or Baudin’s cockatoo until it is no longer in use for that breeding season and the chick(s) has fledged, as determined by the *fauna specialist* under condition 7(a) of this Permit.

8. Fauna management – artificial black cockatoo nest hollows

- (a) Within 12 months of the date of this Permit, the Permit Holder shall install at least 15 artificial black cockatoo nest hollows within the area hatched red on attached Plan 7473/1(b).
- (b) The design and placement of the artificial black cockatoo nest hollows must be determined based on the guidelines provided in Schedule 1.
- (c) The Permit Holder must monitor and maintain the installed artificial black cockatoo nest hollows for a period of at least ten years; and
- (d) Monitoring and maintenance must be undertaken in accordance with the guidelines provided in Schedule 2.

9. Revegetation and Rehabilitation

- (a) The Permit Holder shall *revegetate* and *rehabilitate* 4.5 hectares within the areas cross-hatched red on attached Plan 7473/1(c).
- (b) *Revegetation* and *rehabilitation* identified under condition 9(a) must commence within 12 months of this permit be granted.
- (c) The Permit Holder shall monitor annually for a period of 10 years areas *revegetated* and *rehabilitated* to determine species richness, density, structure and weed cover and to assess areas *revegetated* and *rehabilitated* under this Permit against the completion criteria identified at condition 9(d).
- (d) The Permit Holder shall achieve the following completion criteria after the 10 year monitoring period for areas *revegetated* and *rehabilitated* under this Permit.

Completion criteria	Minimum to be achieved
Species richness	10 native species
Density of foraging species for <i>Calyptorhynchus baudinii</i> , <i>Calyptorhynchus latirostris</i> and <i>Calyptorhynchus banksii</i> subsp. <i>naso</i>	60%
Overstorey Density	900 stems per hectare
Midstorey Density	1500 stems per hectare
Understorey Density	600 stems per hectare
Structure Overstorey	30%
Structure Midstorey	50%

Completion criteria	Minimum to be achieved
Structure Understorey	20%
Weed Cover	<20%

- (e) The Permit Holder shall undertake the following remedial actions for areas *revegetated* and *rehabilitated* where remedial triggers are met during the 10 year monitoring period.

Contingency trigger	Contingency action
Mean weed foliage cover >20%	<ul style="list-style-type: none"> • Implement revised hygiene control measures
Mean number of stems per hectare <3000 Species diversity <10 Structure – overstorey <30% Structure – midstorey <50% Structure – understorey <20%	<ul style="list-style-type: none"> • Undertake direct seeding; and • Procure or propagate additional seedlings and undertake infill planting

10. Offsets – conservation covenant

Prior to undertaking any clearing authorised under this Permit, and no later than 4 August 2019 the Permit Holder shall:

- give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* setting aside the area hatched red on attached Plan 7473/1(b) for the protection and management of vegetation in perpetuity; and
- provide to the CEO a copy of the executed conservation covenant.

PART III - RECORD KEEPING AND REPORTING

11. Records must be kept

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

- In relation to the clearing of native vegetation authorised under this Permit:
 - the species composition, structure and density of the cleared area;
 - 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;
 - the date that the area was cleared;
 - the size of the area cleared (in hectares);
 - actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 5 of this Permit; and
 - actions taken to minimise the risk of the introduction and spread of *dieback* and *weeds* in accordance with condition 6 of this Permit.
- In relation to condition 7:
 - the location of *habitat tree(s)* identified as being utilised by Carnaby's cockatoo, forest red-tailed black cockatoo, Baudin's cockatoo, south-western brush-tailed phascogale or chuditch 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;
 - the evidence by which it was determined the *habitat tree(s)* was being utilised including the date of that determination;
 - the location of any chuditch or south-western brush-tailed phascogale, as listed in condition 7(c), relocated 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
 - the evidence by which it was determined the Carnaby's cockatoo, forest red-tailed black cockatoo and Baudin's cockatoo chick(s) had fledged including the date of that determination.

- (c) In relation to condition 8:
 - (i) the date that each artificial black cockatoo nest hollow was installed;
 - (ii) the location where each artificial black cockatoo nest hollow was 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 installed artificial black cockatoo nest hollow;
 - (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);
 - (v) the dates when each artificial black cockatoo nest hollow was monitored;
 - (vi) the methodology and results of the artificial black cockatoo nest hollow monitoring;
 - (vii) the dates when each artificial black cockatoo nest hollow was maintained; and
 - (viii) a description of the maintenance activities undertaken for each artificial black cockatoo nest hollow.

- (d) In relation to the revegetation of areas pursuant to condition 9 of this Permit:
 - (i) the location of any area *revegetated* and *rehabilitated* recorded as a *shapefile*;
 - (ii) a description of the *revegetation* and *rehabilitation* activities undertaken;
 - (iii) the size of the area *revegetated* and *rehabilitated* (in hectares);
 - (iv) the date that the area was *revegetated* and *rehabilitated*; and
 - (v) a copy of a report(s), prepared by an *environmental specialist*, detailing the *revegetation* and *rehabilitation* activities undertaken and results for the monitoring of density, diversity, structure and weed cover.

12. 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 11 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 9 May 2029, the Permit Holder must provide to the CEO a written report of records required under condition 11 of this Permit, where these records have not already been provided under condition 12(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*.

dieback means the effect of *Phytophthora* species on native vegetation.

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.

fauna specialist: means a person:

- (a) Who holds a tertiary qualification specializing in environmental science or equivalent, has a minimum of two years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed and holds a valid fauna licence issued under the *Wildlife Conservation Act 1950*; or
- (b) Who does not have appropriate professional qualifications, but has a minimum of seven years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed and holds a valid fauna licence issued under the *Wildlife Conservation Act 1950*.

fauna survey: means a field-based investigation of the biodiversity of fauna.

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

habitat tree(s) 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.

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.

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 species-led ecological impact and invasiveness ranking 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*

30 July 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

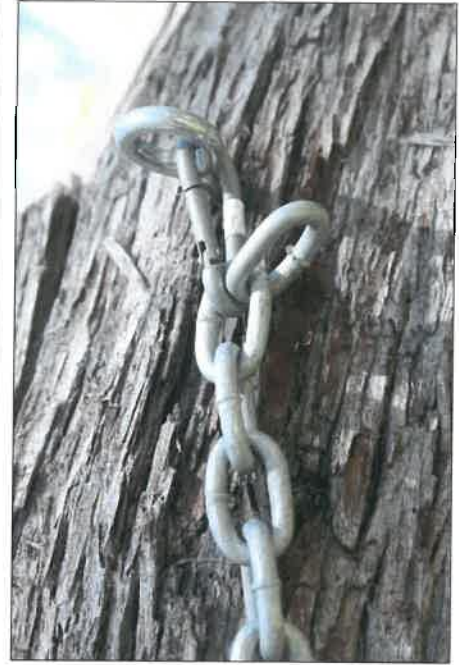
Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring 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>

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



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 (wildlifelicensing@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

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Further information

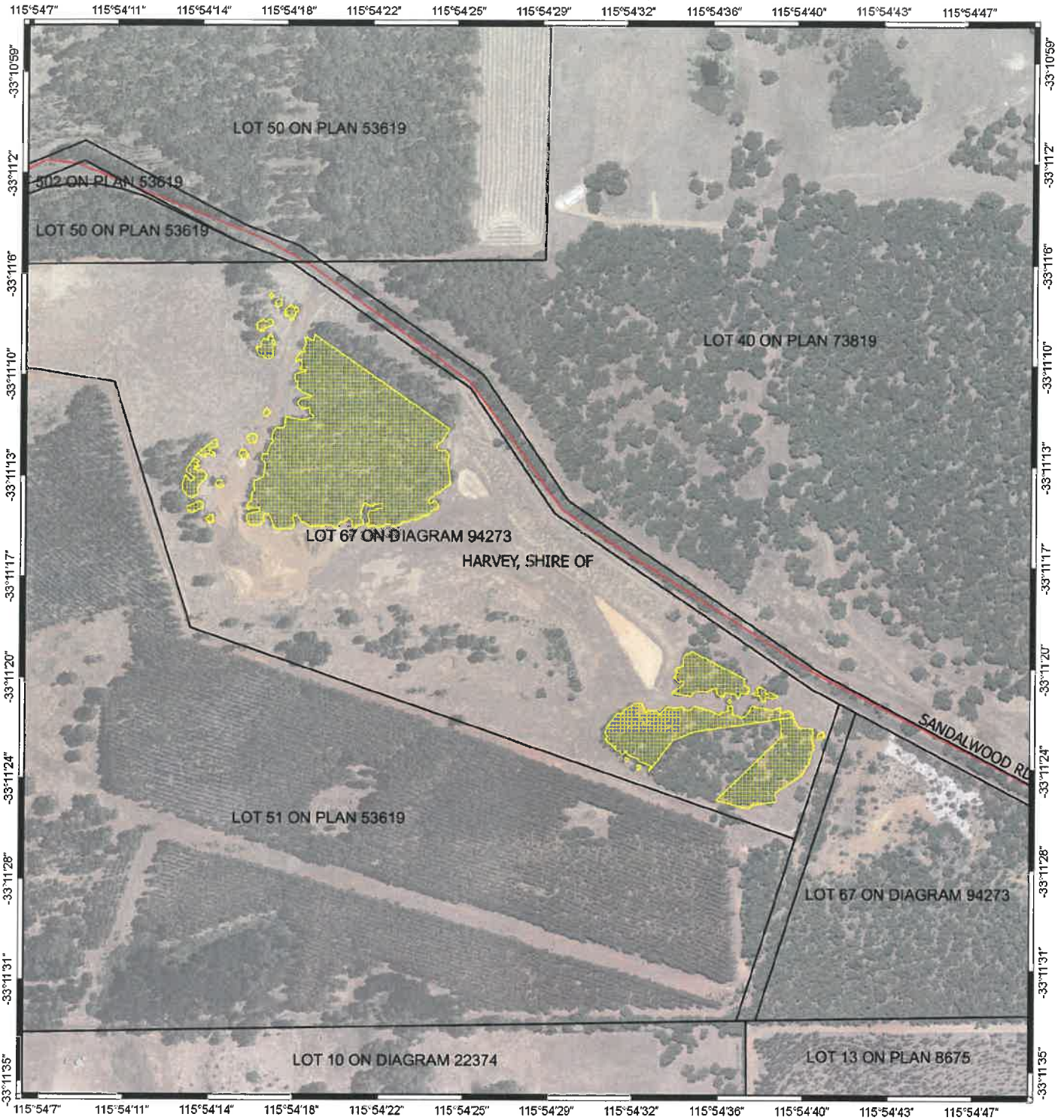
Last updated 28/04/2015

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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Plan 7473/1(a)



Legend

-  Areas approved to clear base layers
-  Cadastre
-  roads
-  Local Government Authority
- Virtual Mosaic - WA Now



200 0 200 m



MGA 94
Geocentric Datum of Australia 1994

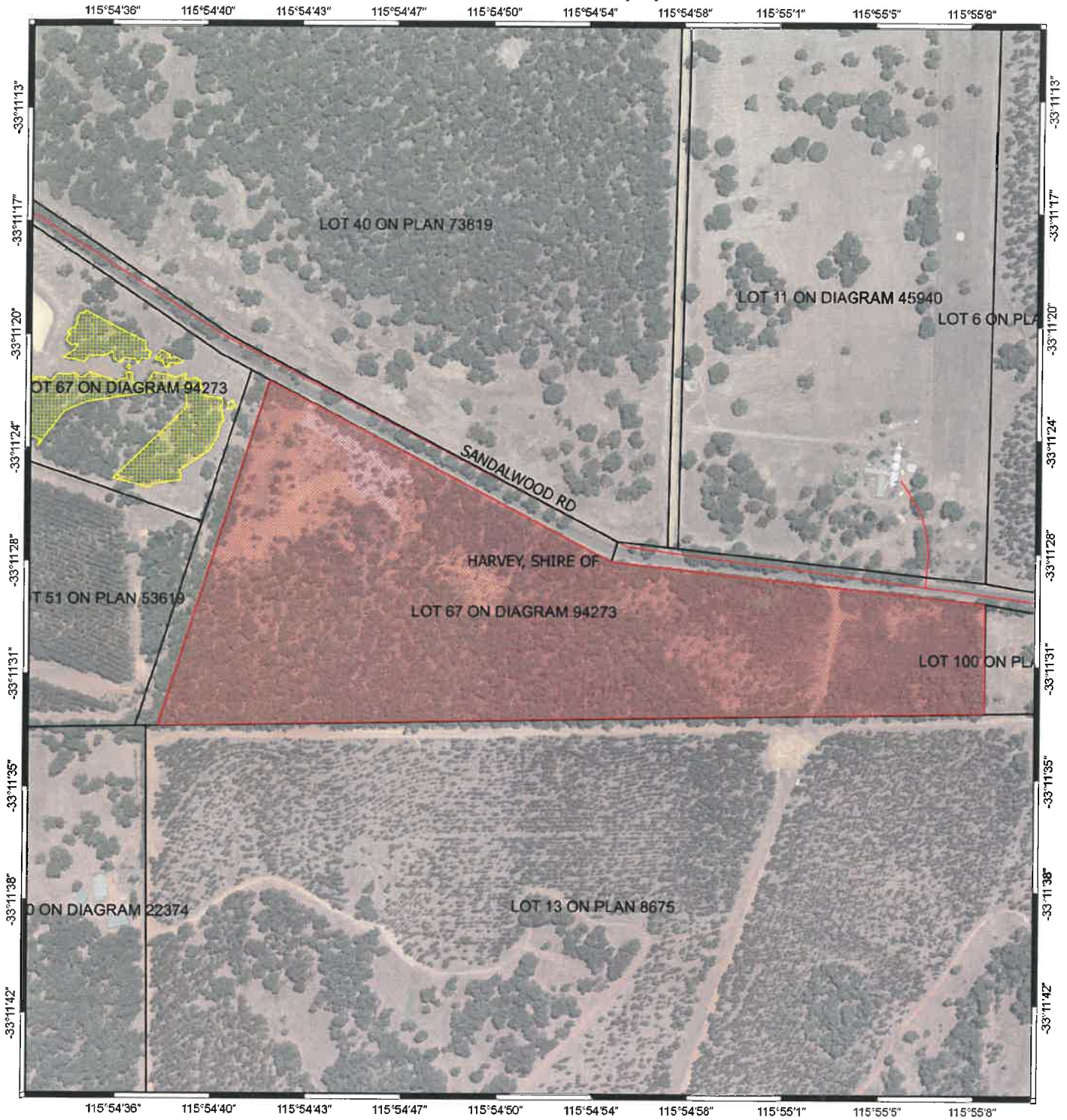
M. Gorman Date: 30/07/2018
Matthew Gorman

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








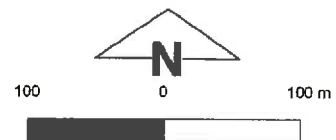
GOVERNMENT OF
WESTERN AUSTRALIA

Plan 7473/1(b)



Legend

-  Covenant Area
-  CPS areas applied to clear base layers
-  Cadastre
-  roads
-  Local Government Authority
- Virtual Mosaic - WA Now



MGA 94
Geocentric Datum of Australia 1994

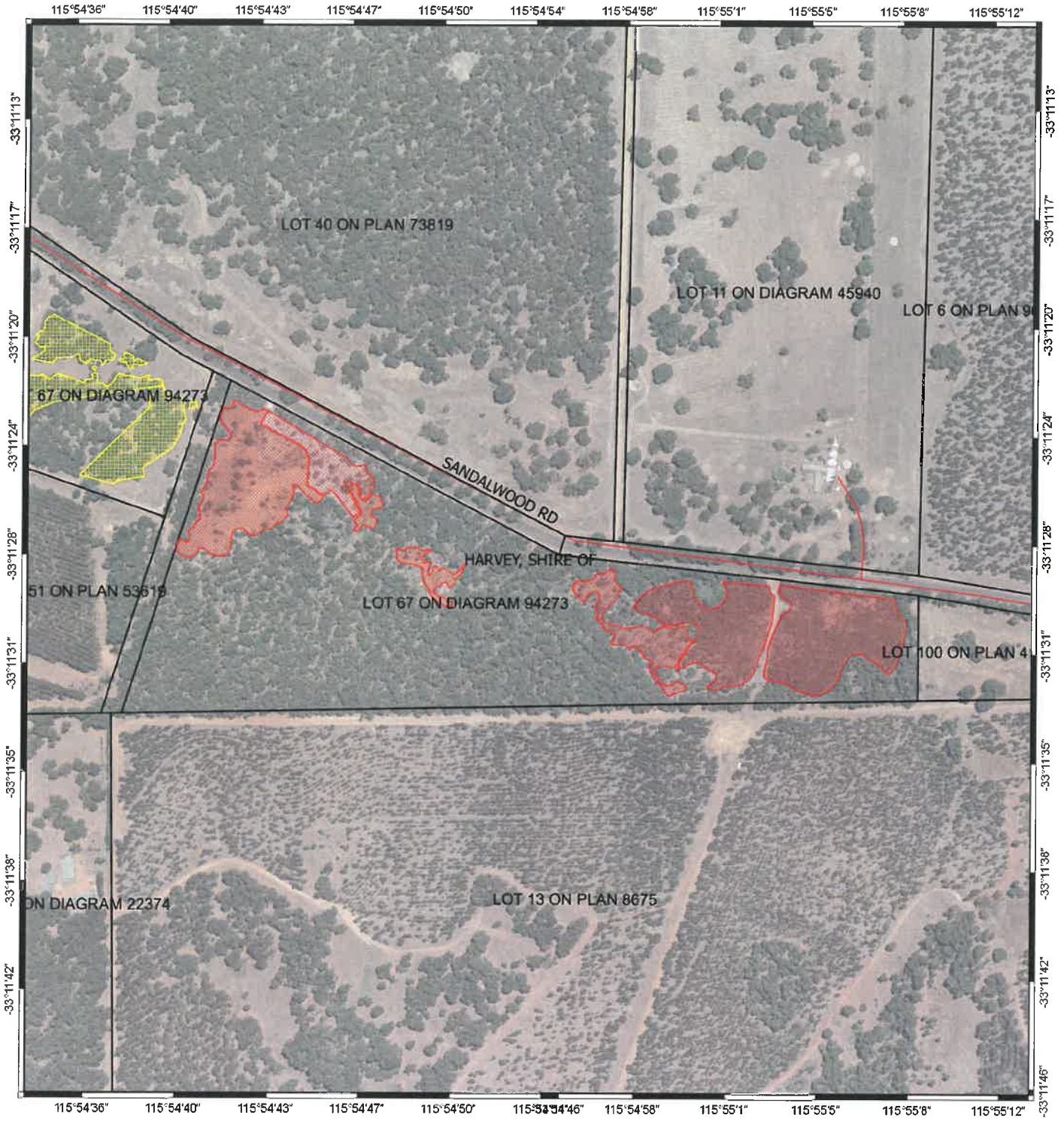
Matthew Gonnahey Date: *30/07/2018*

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










GOVERNMENT OF
WESTERN AUSTRALIA

Plan 7473/1(c)



Legend

-  Revegetation Area 1
 -  Gravel Areas
 -  Sand_Topsoil Areas
 -  CPS areas applied to clear base layers
 -  Cadastre
 -  roads
 -  Local Government Authority
- Virtual Mosaic - WA Now



MGA 94
Geocentric Datum of Australia 1994
M. G. G. Date 30/07/2018
Matthew Gormley

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





1. Application details

1.1. Permit application details

Permit application No.: 7473/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Carbone Bros Pty Ltd
Application received date: 10 February 2017

1.3. Property details

Property: Lot 67 on Diagram 94273
Local Government Authority: Shire of Harvey
Localities: Brunswick

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 30 July 2018

Reasons for Decision: 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* (EP Act). It has been concluded that the proposed clearing is at variance to principle (b), and is not likely to be at variance to the remaining principles.

It has been determined that the proposed clearing will result in the loss of 4.5 hectares of foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*) (collectively referred to as black cockatoos) and 14 trees that provide suitable breeding habitat for these species. The proposed clearing will also impact on the values of a regionally significant ecological linkage and on suitable habitat for south-western brush-tailed phascogale (*Phascogale tapoatafa* subsp. *wambenger*) and chuditch (*Dasyurus geoffroii*).

The applicant has avoided and minimised impacts through reducing the application area from 5.9 hectares to 4.5 hectares, excluding 1.4 hectares of suitable foraging habitat and seven suitable breeding trees for black cockatoos. The applicant has also committed to installing 15 artificial nesting hollows within an adjacent area of remnant vegetation (proposed for conservation as discussed below), and this commitment will be conditioned on the clearing permit.

After consideration of the above, the Delegated Officer determined that the requirement to place a conservation covenant over 15 hectares of remnant native vegetation (the offset area), that contains suitable foraging and breeding habitat for black cockatoos, and contributes towards ecological linkage values, will counterbalance the remaining significant residual impacts. The applicant will also be required to rehabilitate 4.5 hectares of the proposed offset site to increase the overall quality of the site, subject to specific completion criteria and contingency measures.

To minimise the potential for chuditch, south-western brush-tailed phascogale and nesting black cockatoos to be impacted as a result of the clearing activity, the applicant will be required to inspect suitable habitat trees prior to undertaking any clearing. Should any chuditch or south-western brush-tailed phascogale be identified, the applicant will be required to engage a fauna specialist to remove and relocate these species into nearby suitable habitat. Should any black cockatoo chicks be identified, the applicant will be required to retain these trees until such time that breeding black cockatoos are no longer utilising the habitat tree.

The applicant will be required to implement weed and dieback hygiene measures to mitigate the risk of degradation to nearby native vegetation.

Given the above, the Delegated Officer decided to grant a clearing permit subject to fauna management, weed management and offset conditions.

In determining to grant a clearing permit subject to conditions, the Delegated Officer found that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description

The applicant has applied to clear up to 4.5 hectares of native vegetation within Lot 67 on Diagram 94273, Brunswick, for the purpose of gravel extraction (see figure 1).

Vegetation Description

The application area is mapped as Mattiske vegetation complex D1, which is described as open forest of *Eucalyptus marginata* subsp. *marginata* (jarrah) - *Corymbia calophylla* (marri) on lateritic uplands in mainly humid and subhumid zones (Mattiske and Havel, 1998).

A site inspection of the application area undertaken by officers of the former Department of Environment Regulation (DER) described the vegetation under application as jarrah and marri forest with *Banksia grandis*, *Xanthorrhoea* sp., thickets of bracken fern (*Pteridium esculentum*) and *Acacia* sp.

Vegetation Condition

Completely degraded: No longer intact; completely/almost completely without native species (Keighery, 1994);

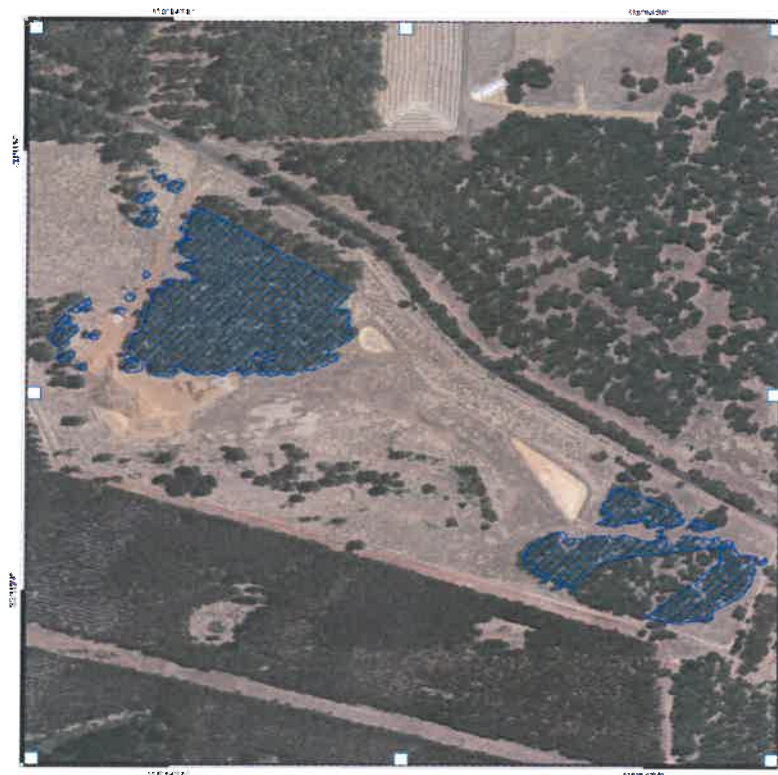
To:

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).

The majority of vegetation under application is in a good (Keighery, 1994) condition (DER, 2017). Signs of historical grazing pressure and fire was observed throughout (DER, 2017).

Soil type

There are two soil types mapped within the application area. The majority of the application area is mapped as 'Hester ironstone gravel ridges phase', described as laterite comprised of gravels with sands and loams. The south-western corner of the application area is mapped as 'Balingup moderate slopes phase', and is described as part of the Balingup soils subsystem with slopes of 15 to 25 per cent and relief of 60 to 120 metres.



Legend

Areas applied to clear
W.A.N.O.w. Imagery



Figure 1. Application Area

3. Minimisation and mitigation measures

On 1 August 2017 the applicant requested to amend the application area from 5.9 hectares to 4.5 hectares to minimise the extent of environmental impacts as a result of the proposed clearing. The amendment has resulted in the exclusion of 1.4 hectares of black cockatoo foraging habitat and eight potential nesting trees. The applicant has also committed to the installation of 15 artificial nesting hollows within an adjacent area of remnant vegetation, which is proposed for conservation (see section 6).

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 application area comprises 4.5 hectares of native vegetation in completely degraded to good (Keighery, 1994) condition, with the majority of vegetation in good (Keighery, 1994) condition (DER, 2017). Signs of significant historical grazing pressure and fire were observed during a site inspection by officers of the former DER (2017), and the majority of the understorey vegetation subsequently lacks diversity. The vegetation within the application area comprises jarrah and marri forest with *Banksia grandis*, *Xanthorrhoea* sp., thickets of bracken fern (*Pteridium esculentum*) and *Acacia* sp. The application area is considered to be largely representative of the mapped D1 Matisse vegetation complex, which is described as 'jarrah - marri open forest' (DER, 2017).

The local area considered in the assessment of this application is defined as a 10 kilometre radius surrounding the application area. The local area contains approximately 37 per cent native vegetation cover. The landscape west of the application area has been extensively cleared for agriculture, while large areas of remnant native vegetation occur to the east of the application area, including the Harris River State Forest.

No threatened ecological communities (TEC) or priority ecological communities (PEC) have been recorded in the local area (10 kilometre radius from the application area), and the former Department of Parks and Wildlife (Parks and Wildlife) advised that the application area is unlikely to support a TEC or PEC (Parks and Wildlife, 2017).

According to available databases, six priority flora species have been recorded in the local area. No rare flora species have been recorded in the local area. The former Parks and Wildlife provided comment on potential impacts to conservation significant flora and advised that the application area may support *Lomandra whicherensis* (Priority 3) and *Senecio leucoglossus* (Priority 4). These species are known from 16 and 40 records respectively. Parks and Wildlife noted that the proposed clearing is not likely to impact on the conservation of either species if they are present (Parks and Wildlife, 2017).

As discussed under Principle (b), the application area provides foraging and breeding habitat for Carnaby's cockatoo, Baudin's cockatoo and the forest red-tailed black cockatoo (collectively known as black cockatoos). The application area also provides suitable habitat for chuditch and south-western brush-tailed phascogale. The application area contributes towards the values of a regionally significant ecological linkage.

While the application area contributes to linkage values and contains suitable habitat for the abovementioned conservation significant fauna, noting that the application area is not representative of any TEC's or PEC's, is not likely to contain rare or priority flora, and has been extensively grazed, it is not likely to contain a high level of biological diversity.

Given the above, 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

The fauna habitat type within the application area is identified as jarrah and marri open forest (DER, 2017).

According to available databases, nine threatened, five priority 4 and six migratory fauna species have been recorded within the local area (Parks and Wildlife, 2007-), of which the following may utilise habitat within the application area, based on the habitat requirements of these species:

- Carnaby's cockatoo (*Calyptorhynchus latirostris*);
- Baudin's cockatoo (*Calyptorhynchus baudinii*);
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*);
- Chuditch (*Dasyurus geoffroii*);
- Western ringtail possum (*Pseudocheirus occidentalis*); and
- South-western brush-tailed phascogale (*Phascogale tapoatafa* subsp. *wambenger*).

A black cockatoo habitat assessment conducted on 28 March 2017 identified black cockatoo foraging and nesting habitat within the application area (Harewood, 2017).

Baudin's cockatoo, forest red-tailed cockatoo and Carnaby's cockatoo forage on the seeds, nuts and flowers of a large variety of plants including proteaceous species (*Banksia* sp., *Hakea* sp., *Grevillea* sp.), as well as *Allocasuarina* and *Eucalyptus* species, marri, and a range of introduced species (Valentine and Stock, 2008). The black cockatoo habitat assessment noted that jarrah, marri, *Banksia grandis* and *Xanthorrhoea preissii* occur within the application area and are known to be a food source for black cockatoos (Harewood, 2017). Evidence of foraging on marri by forest red-tailed black cockatoo was observed within the application area (DER, 2017; Harewood, 2017).

Noting the above, the application area is considered to provide 4.5 hectares of black cockatoo foraging habitat (DER, 2017; Harewood, 2017).

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). To be suitable as a black cockatoo breeding site, trees require a suitable nest hollow or be of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, a suitable DBH is 500 millimetres (Commonwealth of Australia, 2012).

The black cockatoo habitat survey recorded 14 trees (either jarrah or marri) within the application area with a diameter at breast height of 500 millimetres with hollows that may be suitable for nesting activities by black cockatoos (Harewood, 2017). While no trees showed signs of previous use by black cockatoos for nesting activities (Harewood, 2017), the application area is considered to provide suitable breeding habitat for black cockatoos.

Carnaby's cockatoo has suffered a 30 per cent contraction in range and a 50 per cent decline in population since the late 1940s, 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). Loss of nesting habitat, together with foraging habitat and water sources within 12 kilometres of nesting sites is one of the key threatening processes contributing towards the decline of Carnaby's cockatoo (Saunders and Ingram, 1998; Parks and Wildlife, 2013). The application area contains suitable foraging and nesting habitat and is approximately 530 metres from a wetland. Noting this, the application area is considered to contain significant habitat for Carnaby's cockatoo and is also considered to provide significant habitat for Baudin's cockatoo and the forest red-tailed black cockatoo.

The chuditch has been recorded 10 times within the local area. This species is classified as 'fauna that is rare or is likely to become extinct as vulnerable fauna' under the WC Notice. Chuditch have a preference for eucalypt forest (especially *Eucalyptus marginata*), dry woodland and mallee shrublands and utilise large horizontal hollow logs as dens or refuge. To be suitable as den sites, logs must have a diameter of at least 30 centimetres (usually larger), a hollow diameter of 7 to 20 centimetres and are generally one metre long (DotE, 2014). The recovery plan for this species notes that the most dense chuditch populations have been found in riparian jarrah forest. Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) and sufficient prey biomass (large invertebrates, reptiles and small mammals) to survive (DEC, 2012a). Noting the extensive grazing and lack of substantial native understorey within the application area, it is unlikely that it contains sufficient prey biomass to provide significant habitat for this species, however noting that the application area contains several large hollow horizontal logs, it may be utilised by transient visitors and there is a risk of impacting individuals through the clearing process.

The southern brush-tailed phascogale is classified as 'fauna that is of special conservation need as conservation dependent fauna' under the WC Notice. This species inhabits dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC 2012b). Noting the historical disturbance of the site from extensive cattle grazing, and lack of a continuous tree canopy linking nearby remnants which would assist this species in avoiding predators, the application area is unlikely to be significant for this species. However given that the application area contains several hollow bearing trees, it may be occasionally utilised by the southern brush-tailed phascogale, and there is a risk of impacting individuals through the clearing process.

The western ringtail possum is classified as 'fauna that is rare or likely to become extinct as critically endangered fauna' under the WC Notice. This species has been recorded three times within the local area, with these records more than five kilometres from the application area. The western ringtail possum recovery plan (the Plan) notes that there are three key management zones that provide critical habitat for the western ringtail possum, which include the following (Parks and Wildlife, 2017):

- Swan Coastal Plain: the peppermint woodlands and peppermint/tuart forests on the southern extremity of the Swan Coastal Plain, extending from north of Bunbury to Augusta, but principally around Busselton.
- Southern Forest: Jarrah forests near Manjimup where peppermint is generally absent; and
- South Coast: a diverse range of vegetation types between Walpole and Cheynes Beach, but principally in near-coastal limestone heath, jarrah marri thicket woodland and forest, riparian, peppermint woodland and karri forest vegetation.

The Plan also notes that in Harvey, western ringtail possum habitat is largely confined to riparian peppermint (*Agonis* sp.) trees (Parks and Wildlife, 2017). Given that the application area is not within the abovementioned three key management zones, does not contain *Agonis* sp., and that there are no records of the western ringtail possum within a five kilometre radius of the application area, the proposed clearing is unlikely to impact on this species.

A portion of the application area is within 100 metres of a mapped significant ecological linkage recognised within the South West Regional Ecological Linkages (SWREL) technical report (Molloy et al., 2009). The SWREL technical report classifies linkage vegetation based on significance, and areas within 100 metres of a mapped linkage are classified as 1A (highest value vegetation) as they are considered to form part of the mapped linkage. Ecological linkages have been defined 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" (Molloy et al., 2009).

Removal of vegetation from these corridors at a local level may cause a decrease in ecological linkage values and increase the fragmentation of the landscape (Molloy et al., 2009). The application area acts as a stepping stone of native vegetation and contributes towards north south linkage values. While the proposed clearing will not sever the linkage, it will contribute towards the cumulative loss of vegetation associated with the linkage, and potentially limit the distribution of fauna across the landscape.

Given that the application area contributes to an ecological linkage, contains suitable habitat for chuditch and south-western brush-tailed phascogales and significant habitat for black cockatoos, the proposed clearing is at variance to this Principle.

To minimise direct impacts as a result of clearing to black cockatoos, chuditch and southern-brush tailed phascogale, the applicant will be required to engage a fauna specialist to inspect habitat trees for the presence of these species prior to clearing (discussed further under Section 1.5). The applicant will also be required to install 15 artificial black cockatoo nesting hollows to mitigate impacts to these species.

Taking into account the applicant's avoidance and minimisation measures, it is considered that a suitable offset will counterbalance the loss of 4.5 hectares of habitat for black cockatoos. Section 6 provides further information on the adequacy of the offset provided.

(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

According to available databases, there are no rare flora species recorded within 10 kilometres of the application area. There are five rare flora species recorded between 11 and 12 kilometres of the application area. Based on the habitat preferences of these species, the application area is unlikely to include any of these species.

The former Parks and Wildlife provided comment on the potential impacts of the proposed clearing and advised that the application area is not likely to support any rare flora species (Parks and Wildlife, 2017).

Given the above, 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 likely to be at variance to this Principle

According to available databases, no TEC's have been recorded within 10 kilometres of the application area. The closest TEC to the application area is the federally listed *Banksia* Woodlands of the Swan Coastal Plain threatened ecological community (TEC), which is federally listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). This TEC is located approximately 10.3 kilometres west of the application area. The application area is not considered to be representative of this TEC.

The former Parks and Wildlife provided comment on the potential impacts of the proposed clearing and advised that the application area is not likely to support a TEC (Parks and Wildlife, 2017).

Given the above, the proposed clearing is not likely to be 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 national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 percent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

As indicated in Table 1, the application area occurs within the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, which retains approximately 53.4 per cent of its pre-European vegetation extent (Government of Western Australia, 2018). The application area is mapped as Matiske vegetation complex D1, which retains approximately 86.6 per cent of its pre-European vegetation extent within the Jarrah Forest bioregion (Government of Western Australia 2018). The application area is considered to be representative of this vegetation complex.

Vegetation to the west of the application area has been extensively cleared, while the majority of land east of the application area contains native vegetation within land managed by Parks and Wildlife. The local area contains approximately 37 per cent of its pre-European native vegetation (12,490 hectares within a 33,394 hectare area). The application area represents approximately 0.036 per cent of the remaining native vegetation within the local area and the proposed clearing would reduce the extent of native vegetation within the local area to 12,485.5 hectares.

As discussed under Principle (b), the application area provides habitat for black cockatoos, chuditch, south-western brush-tailed phascogale and supports an ecological linkage (Molloy et al., 2009), therefore the application area is considered to be a significant remnant. However, given that the local area, mapped vegetation complex and Bioregion all retain greater than the abovementioned 30 per cent threshold, and land to the east of the application area contains a large proportion of native vegetation within conservation estate, the proposed clearing is not considered to be within an extensively cleared landscape.

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

Table 1.

	Pre-European (ha)	Current Extent (ha)	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	2,406,938	53.4	1,673,352.8	39.43
Mattiske vegetation complex					
D1	208,490.9	180,683.4	86.6	171,201.7	82.1

(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

There are no watercourses or wetlands mapped within or adjacent to the application area, with the nearest waterbody, a multiple use paluslope, mapped approximately 530 metres north east of the application area. A site inspection undertaken by officers of the former DER did not identify any watercourses, wetlands or riparian vegetation within the application area (DER, 2017).

Given the above, 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

There are two soil types mapped within the application area. The majority of the application area is mapped as 'Hester ironstone gravel ridges phase', described as laterite comprised of gravels with some sands and loams. The south-western corner of the application area is mapped as 'Balingup moderate slopes phase', and is described as part of the Balingup soils subsystem with slopes of 15 to 25 per cent and relief of 60 to 120 metres. A site inspection of the application area identified the presence of sand and gravelly loams (DER, 2017).

The above soil types have a low risk of wind erosion, and dust management requirements as conditioned on the applicants Extractive Industry Licence will assist in minimising the potential for any wind erosion as a result of clearing.

The mapped soil types have a low risk of waterlogging, and a low to moderate risk of salinity. Given the size of the application area (4.5 hectares), and considering that the soils within the application area are well drained and not immediately upslope of any poorly drained soils, the risk of on-site and off-site salinity as a result of the proposed clearing is considered to be low.

The south-western corner associated with Balingup moderate slopes phase soils is considered to have a higher risk of water erosion. A limited portion of the application area is mapped as this soil type, much of which contains vegetation in completely degraded to degraded (Keighery, 1994) condition. Given this, the proposed clearing is unlikely to cause appreciable land degradation via water erosion.

Given the above, 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 application area is within 10 kilometres of four conservation areas. Two conservation areas are within five kilometres of the application area, with Harris River State Forest located 3.1 kilometres east and Department of Biodiversity, Conservation and Attractions freehold land for the purpose of forest conservation located 4.1 kilometres south-east of the application area. These conservation areas are approximately 89,000 and 528 hectares in size, respectively.

As discussed under Principle (b), the proposed clearing will impact on the values of an ecological linkage. The application area acts as a stepping stone of native vegetation and contributes towards north south linkage values. While the proposed clearing will not sever the linkage, it will contribute towards the cumulative loss of vegetation associated with the linkage, and potentially limit the distribution of fauna across the landscape. However, given the size of these conservation areas, and noting that a 15 hectare remnant adjacent to the application area will be conserved in perpetuity (see Section 6), the proposed clearing is unlikely to significantly impede fauna movement between conservation areas and is therefore unlikely to impact on the environmental values of these conservation areas.

Given the above, 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

As discussed under Principle (f), there are no watercourses or wetlands mapped within or immediately adjacent to the application area, with the nearest waterbody (multiple use paluslope) located approximately 530 metres north-east of the application area. The former Department of Water (DoW) advised that runoff within the application area is likely to flow into the property south of the application area (DoW, 2017), and the proposed clearing is unlikely to impact on the abovementioned paluslope. There is one minor non perennial watercourse (approximately 850 metres south west) mapped within the south western portion of the property immediately south, however there are stands of native and planted non-native vegetation that exist between these areas, and the proposed clearing is not likely to significantly impact on this watercourse.

Groundwater salinity within the application area is mapped as 500 to 1000 milligrams per litre total dissolved solids, which is considered to be a marginal. No surface salinity was identified during a site inspection of the application area (DER, 2017). Noting this, the proposed clearing of 4.5 hectares is not likely to cause deterioration in the quality of surface water or groundwater through rising salinity levels.

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

The application area contains moderately permeable soils that are considered to have a low risk of flooding. The application area is on a moderate rise of 250 metres above sea level, and surface water runoff is likely to drain into surrounding soils. The application area is also surrounded by vegetation, both native and plantations. Noting this, the soil type, and the size of the application area (4.5 hectares), the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

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

Planning instruments and other relevant matters.

The application was advertised on the DWER website on 24 February 2017 for a 21 day public submission period. No submissions have been received in relation to this application.

The applicant has obtained an Extractive Industry Licence for the proposed extraction of gravel, subject to conditions (Shire of Harvey, 2018).

There are no Aboriginal Sites of Significance mapped within the application area.

The applicant previously applied to clear native vegetation within the application area on 30 November 2012 (CPS 5399/1). A DER Delegated Officer wrote to the applicant on 22 February 2013, advising that a preliminary assessment of the application identified impacts to foraging, nesting and roosting habitat for Carnaby's cockatoo, Baudin's cockatoo and the forest red-tailed black cockatoo, potential habitat for the southern brush-tailed phascogale, and an ecological linkage Ref: A604627). The DER Delegated Officer also noted that an extractive industry licence had not yet been obtained. The applicant withdrew clearing permit application CPS 5399/1 on 18 March 2013.

5. Applicant's Submissions

DWER wrote to the applicant on 1 June 2017 advising that the proposed clearing would impact on significant habitat for black cockatoos and a regional ecological linkage. In response to DWER's letter the applicant wrote to DWER on 1 August 2017 to request for the application area to be amended from 5.9 hectares to 4.5 hectares, and provide an offset proposal to address the abovementioned impacts.

Upon reviewing the offset proposal, DWER wrote to the applicant on 5 September 2017 to advise that the offset was not adequate, and provided information relating to what a suitable offset would constitute. The applicant consequently provided a commitment to a revised offset (including the conservation of 15 hectares of remnant vegetation - see Section 6 below), and on 6 March 2018 provided a revegetation plan detailing revegetation works to be undertaken within the offset site.

On 9 April 2018, DWER phoned the applicant to advise of some inadequacies with the revegetation plan, and the applicant subsequently provided a revised revegetation plan on 9 April 2018.

On 5 June 2018, the applicant emailed DWER with a copy of the approved extractive industry licence.

It is considered that the information provided by the applicant was sufficient for DWER to make a determination on the clearing permit application.

6. Suitability of Proposed Offset

Principle 1 of the *WA Environmental Offsets Policy September 2011* outlines that environmental offsets will only be considered after avoidance and mitigation options have been pursued. The *WA Environmental Offsets Guidelines August 2014* outlines a four step mitigation hierarchy; avoid, minimise, rehabilitate and offset. The avoidance and mitigation measures assessed within section 3 are deemed to be adequate in addressing this requirement.

The Delegated Officer determined that the proposed clearing will impact on the values of an ecological linkage, 4.5 hectares of significant habitat for black cockatoos and suitable habitat for chuditch and south-western brush-tailed phascogale.

To offset the abovementioned significant residual impacts, the applicant proposed to acquire and conserve a nearby remnant of native vegetation (offset area) that comprises 15 hectares of foraging habitat for black cockatoos, and 8 suitable black cockatoo breeding trees. The applicant also proposes to rehabilitate and revegetate approximately 4.5 hectares of the offset area, to increase the overall quality of the vegetation. The applicant's mitigation measures include a commitment to install 15 artificial hollows to support black cockatoo nesting within the offset area.

In assessing whether the proposed offset is adequately proportionate to the significance of the habitat values being impacted, DWER undertook a calculation using the Commonwealth Offsets Assessment Guide. The calculation indicated that the conservation of 15 hectares of native vegetation, together with the revegetation and rehabilitation of 4.5 hectares of the conservation site to increase its overall quality, is considered adequate to counterbalance the significant residual impacts of the proposed clearing, consistent with the *WA Environmental Offsets Policy September 2011*.

7. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species, Canberra.
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