



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: 8802/1
File Number: DWERTV5307
Duration of Permit: 3 June 2020 – 3 June 2030

PERMIT HOLDER

City of Swan

LAND ON WHICH CLEARING IS TO BE DONE

Railway Parade Road Reserve (PIN 11727298), Bullsbrook

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 0.7609 hectares of native vegetation within the area cross-hatched yellow on attached Plan 8802/1a, Plan 8802/1b, Plan 8802/1c and Plan 8802/1d.

CONDITIONS

1. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

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

2. 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;
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared;

3. Fauna management - black cockatoo nesting trees

- (a) Immediately prior to undertaking any clearing authorised under this Permit:
 - (i) the area cross-hatched yellow on attached Plan 8802/1a, Plan 8802/1b, Plan 8802/1c and Plan 8802/1d shall be inspected by a *fauna specialist* who shall identify *black cockatoo nesting trees*; and
 - (ii) each *black cockatoo nesting tree* identified shall be inspected by a *fauna specialist* for evidence of current or past breeding use by *black cockatoos*.
- (b) Where a *black cockatoo nesting tree(s)* with evidence of current breeding use by *black cockatoos* is identified and cannot be avoided, that tree(s) shall be monitored by a *fauna specialist* to determine when it is no longer in use for that *breeding season*.
- (c) Any *black cockatoo nesting tree(s)* with evidence of current breeding use by *black cockatoos* shall not be cleared while it is in use as determined by the *fauna specialist* under condition 3(b) of this Permit.
- (d) Where a *black cockatoo nesting tree(s)* with evidence of past breeding use by *black cockatoos* is identified and cannot be avoided, that tree(s) shall only be cleared:

- (ii) later the same day of the inspection required under condition 3(a)(ii) of this Permit if that inspection does not identify evidence of current breeding use; or
- (iii) later the same day of a repeat inspection undertaken by a *fauna specialist* if that inspection does not identify evidence of current breeding use.

4. Fauna management – artificial black cockatoo nest hollows

- (a) Within six months of clearing of *black cockatoo nesting trees* identified under Condition 3, and before the following *breeding season*, the Permit Holder shall install at least one artificial black cockatoo nest hollows for every *black cockatoo nesting tree(s)* cleared, identified under Condition 3;
- (b) The design and placement of the artificial black cockatoo nest hollows must be determined based on the guidelines provided in Schedule 1 and must be installed within the area hatched red on attached Plan 8802/1a, Plan 8802/1b, Plan 8802/1c, Plan 8802/1d and Plan 8802/1e;
- (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.

PART III - RECORD KEEPING AND REPORTING

5. 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 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;
 - (ii) the date that the area was cleared;
 - (iii) the size of the area cleared (in hectares);
 - (iv) the direction of the clearing;
 - (v) actions taken to avoid, minimise and reduce the impacts and extent of clearing; in accordance with condition 1 of the Permit; and
 - (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 2 of the Permit.
- (b) In relation to fauna management pursuant to condition 3 of this Permit:
 - (i) the time(s) and date(s) of inspection(s) by the *fauna specialist*;
 - (ii) a description of the *fauna specialist* inspection methods employed;
 - (iii) the location of each *black cockatoo nesting tree* identified, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iv) a description of the evidence of current or past breeding use observed for each *black cockatoo nesting tree* identified;
 - (v) a photo of each *black cockatoo nesting tree* with evidence of current or past breeding use identified;
 - (vi) for each *black cockatoo nesting tree* with evidence of current breeding use:
 - (1) the time and date it was determined to no longer be in use for that breeding season; and
 - (2) the evidence by which it was determined to no longer be in use for that breeding season.
 - (vii) the time and date each *black cockatoo nesting tree* with evidence of current or past breeding use was cleared.

- (c) In relation to the installation of artificial black cockatoo nest hollows pursuant to condition 4 of this Permit:
- (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) the dates each artificial *black cockatoo* nest hollow installed was monitored;
 - (v) a description of the monitoring methods employed for each artificial *black cockatoo* nest hollow installed;
 - (vi) a description of the monitoring observations for each artificial *black cockatoo* nest hollow installed;
 - (vii) the date(s) each artificial *black cockatoo* nest hollow installed was maintained;
 - (viii) a description of the maintenance activities undertaken for each artificial *black cockatoo* nest hollow installed; and
 - (ix) the total number of artificial hollows installed.

6. 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 5 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, 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 19 November 2029, the Permit Holder must provide to the *CEO* a written report of records required under condition 5 of this Permit where these records have not already been provided under condition 6(a) of this Permit.

DEFINITIONS

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

black cockatoo(s) means Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*);

black cockatoo nesting tree/s means trees that have a diameter, measured at 1.5 metres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Euclayptus salmonophloia* or *Eucalyptus wandoo*) that contain hollows suitable for nesting by Carnaby's cockatoo, Baudin's cockatoo or forest red-tailed black cockatoo;

breeding season means the period from 1 June to 29 February of any given year;

CEO means the Chief Executive Officer of the Department responsible for administering the clearing provisions contained within the *Environmental Protection Act 1986*;

fauna specialist means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of two years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the *CEO* as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.

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

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;

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*

4 May 2020

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

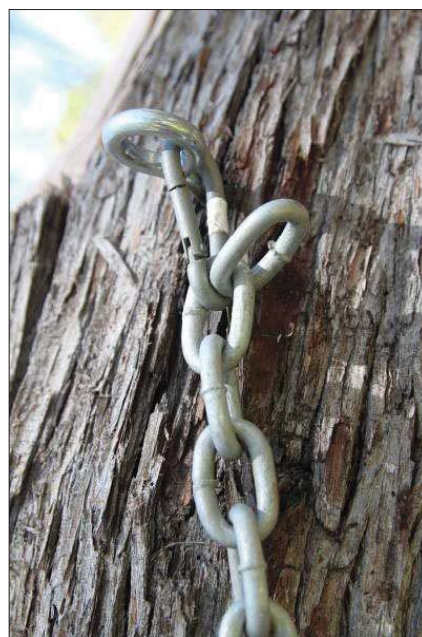
Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring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



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

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

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

Monitoring should be undertaken in order to detect:

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



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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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



Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

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

Acknowledgements

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

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Further information

Last updated 28/04/2015

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Plan 8802/1a




Legend

-  CPS areas approved to clear
-  CPS subject to conditions
-  Local Government Authorities
-  Roads
-  Image



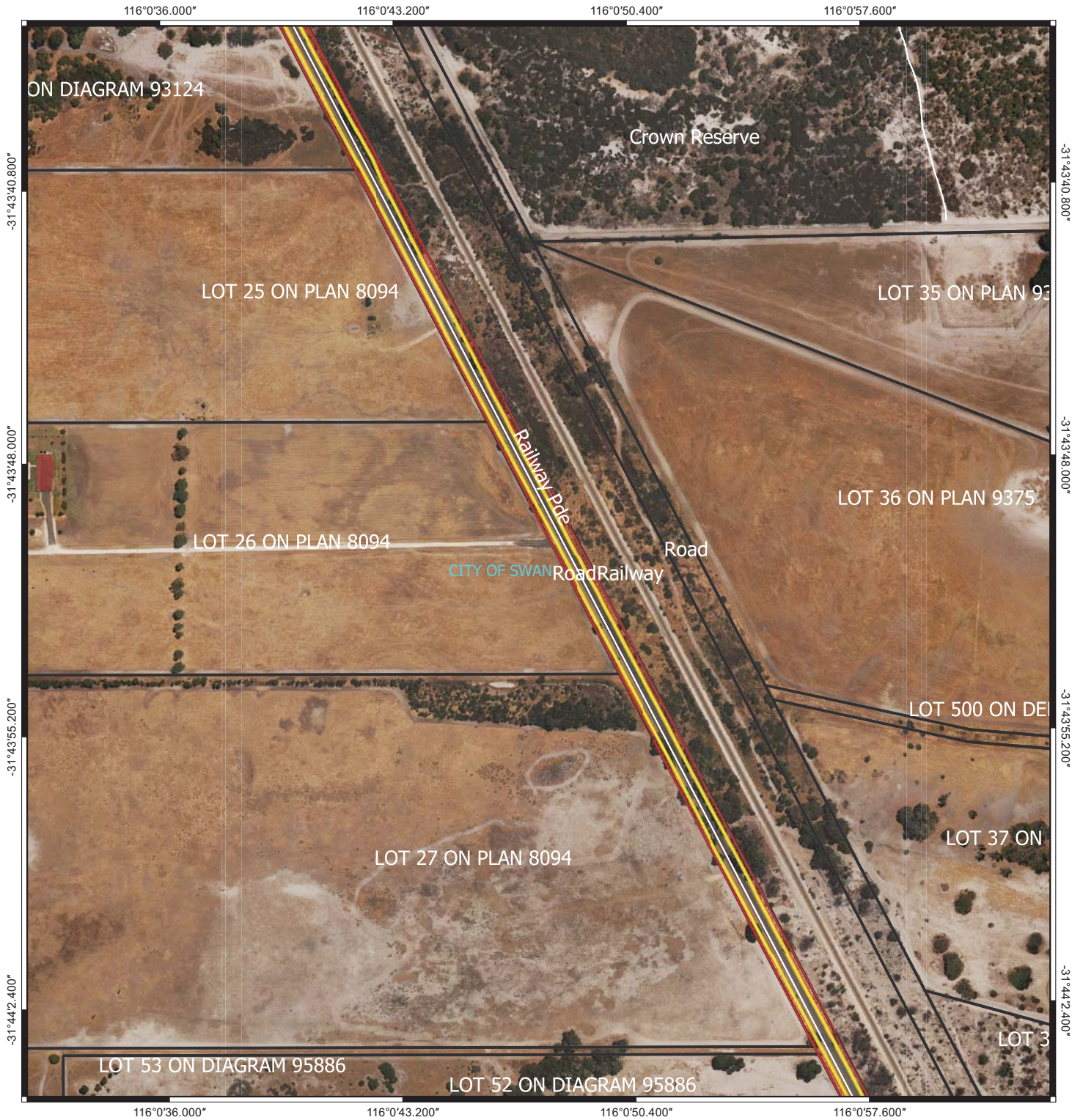
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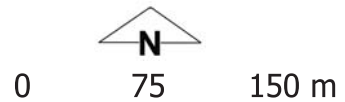


Plan 8802/1b




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-  CPS areas approved to clear
-  CPS subject to conditions
-  Local Government Authorities
-  Roads
-  Image



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Plan 8802/1c

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116°0'43.200"

-31°43'12.000"

-31°43'19.200"

-31°43'26.400"

-31°43'33.600"

-31°43'12.000"

-31°43'19.200"

-31°43'26.400"

-31°43'33.600"








116°0'21.600"

116°0'28.800"

116°0'36.000"


116°0'43.200"

Legend

-  CPS areas approved to clear
-  CPS subject to conditions
-  Local Government Authorities
-  Roads
-  Image



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
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Plan 8802/1d



Legend

-  CPS areas approved to clear
-  CPS subject to conditions
-  Local Government Authorities
-  Roads
-  Image



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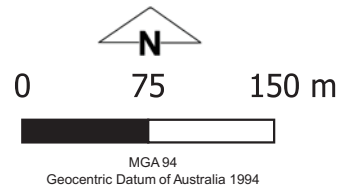
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Plan 8802/1e



Legend

-  CPS subject to conditions
-  Local Government Authorities
- Roads
- Image



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Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8802/1
Permit type: Area Permit

1.2. Applicant details

Applicant's name: The City of Swan
Application received date: 07 February 2020

1.3. Property details

Property: Railway Parade Road Reserve (PIN 11727298)
Local Government Authority: City of Swan
Localities: Bullsbrook

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
0.7609		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 4 May 2020

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 with principle (f), may be at variance with principle (b) and (h), and is not likely to be at variance to the remaining principles.

Through the assessment it was identified that the proposed clearing includes vegetation growing in association with a watercourse and wetlands. The Delegated Officer determined that no significant impacts to the environmental values of the water bodies are expected given the degraded (Keighery, 1994) condition of vegetation and minimal extent of the clearing proposed.

Through assessment it has been determined that the application area contains suitable nesting habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), including one tree containing two hollows. To mitigate impacts associated with the loss of the nesting tree, the applicant will be required to install two artificial nesting hollows within Railway Parade Road Reserve (PIN 11727298).

The application area is located within and adjacent to Bush Forever site 400 and the proposed clearing will impact this conservation area through the loss of vegetation and the potential spread of weed and dieback. The Delegated Officer determined that the proposed clearing will not significantly impact Bush Forever site 400 due to the size and condition of the vegetation within the proposed clearing area, as well as being located adjacent to an existing roadway. Weed and dieback management practices will assist in managing potential impacts to adjacent vegetation.

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

In determining to grant a clearing permit subject to the above management conditions, the Delegated Officer found that the proposed clearing is not likely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description

The City of Swan (the applicant) proposes to clear 0.76 hectares of native vegetation within Railway Parade Road Reserve (PIN 11727298), Bullsbrook, for the purpose of improving road safety (Figure 1a-b and Figure 2a-d).

The application area comprises of all vegetation that falls within 1.5 metres from the edge of the existing formation (edge of shoulders) on both sides of Railway Parade. Up to three metres of native vegetation will remain on either side of the proposed clearing area.

Vegetation Description

The application area occurs within the 'Swan Coastal Plain' Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, and is mapped as the 'Yanga Complex' Swan Coastal Plain vegetation complex (Heddlé, 1980). The Yanga Complex is described

as a predominantly closed scrub of *Melaleuca* species and low open forest of *Casuarina obesa* (Swamp Sheoak) on the flats subject to inundation. On drier sites the vegetation reflects the adjacent vegetation complexes of Bassendean and Coonambidgee.

A site inspection of the application area was conducted by the Department of Water and Environmental Regulation (DWER) on 13 March 2020.

The site inspection identified that vegetation within the application area comprises of four vegetation types:

- Parkland cleared vegetation – approximately 52.5 per cent (0.4 hectares) of the application area (Figure 2a);
- A mixture of *Melaleuca* sp., *Jacksonia furcellata*, *Acacia saligna* over weedy understorey – approximately 27.5 per cent (0.21 hectares) of the application area (Figure 2b);
- Vegetation appeared to be representative of Banksia Dominated Woodlands of the Swan Coastal Plain (Banksia woodland) – approximately 13 per cent (0.099 hectares) of the application area (Figure 2c); and
- Marri woodland over weedy understorey – approximately seven per cent (0.05 hectares) of the application area (Figure 2d).

The DWER site inspection (2020) noted that a portion of the application area (approximately 0.005 hectares) has been impacted by a recent burn.

Vegetation Condition

The condition of the vegetation within the application area is considered to be in degraded to completely degraded condition, described as:

- Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
- Completely Degraded; No longer intact, completely/almost completely without native species (Keighery, 1994).

The condition of the vegetation was determined by the DWER site inspection (DWER, 2019).

Soil type

The application area is mapped as the following land subsystems (Schoknecht et al., 2004):

- Yanga 8x Phase subsystem (approximately 28 per cent) is described as flat plain with occasional low dunes. Subject to seasonal inundation. Deep white and pale yellow sands interspersed with swamp and generally underlain by siliceous/humic pans at depth;
- Yange 9x Phase subsystem (approximately 24 per cent) is described as flat plain with occasional low dunes. Subject to seasonal inundation. Humic and peaty sands, wet and semi-wet soils generally underlain by siliceous / humic pans at depth. *E. rudis*, *Melaleuca* spp., reeds and some *Banksia* on dunes;
- Yanga 14x Phase subsystem (approximately 34 per cent) is described as sandy rises on flat to gently sloping plain with occasional low dunes. Pale sands overlying siliceous / humic pans, bog iron and clay. Low woodland of *Banksias prionotes*, *B. illicifolia* and *B. littoralis*, *Melaleuca* dense shrubbery.
- Yanga 7x Phase (approximately 10 per cent) is described as Flat plain with occasional low dunes. Marl maybe at the surface or deeply buried, overlying alluvium, often with siliceous hardpans. Low woodland with occasional tall *E. rudis*, *Melaleuca* spp., *Teatree* and *E. camaldulensis*.
- Yanga 6x Phase (approximately 4 per cent) is described as Flat plain with occasional low dunes. Yellowish brown duplex and poorly structured clay soils often with pans underlying. Low woodland with occasional tall *E. rudis*, *Melaleuca* spp., *Teatree* and *E. camaldulensis* and *Casuarina* spp.

Comments

The local area is considered as a 10 kilometre radius from the perimeter of the application area.



Figure 1a Northern section of the application area cross-hatched blue



Figure 1b Southern section of the application area cross-hatched blue



Figure 2a



Figure 2b



Figure 2c



Figure 2d

Figures 2a-d: Representative photos of the vegetation within the application area (DWER, 2020).

3. Minimisation and mitigation measures

In relation to whether alternatives have been considered that would avoid or minimise the need for clearing, the applicant has advised (Applicant, 2020a):

“Previously considered widening the road formation width from 8m to 10m but determined that this would result in the removal of too many trees. Therefore, the existing eight-meter formation width has been kept the same in favour of minimising tree removal.”

The applicant confirmed that the City of Swan had considered treatment options to minimise the impact on flora and fauna in the area of proposed clearing along Railway Parade. The City of Swan arrived to the conclusion that clearing vegetation within 1.5 metre of the existing edge of formation will minimise the impact, while also ensuring that the necessary work is conducted to ensure road user safety at this location (Applicant, 2020b).

4. Assessment of application against clearing principles

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

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

According to available databases, 10 threatened and 40 priority flora species have been recorded within the local area. Threatened flora are discussed further under Principle (c). Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, the following five priority species may occur within the application area:

- *Cyathochaeta teretifolia* (Priority 3) – is known from eight populations within the local area spread across approximately 11.5 kilometres. The closest individual from the application was recorded approximately 2.9 kilometres southwest.
- *Meionectes tenuifolia* (Priority 3) – is known from a single population that can be found approximately 2.8 kilometres southwest of the application area.
- *Stylidium paludicola* (Priority 3) – is known from three populations in the local area spread across approximately 11.5 kilometres. The closest recorded can be found approximately two kilometres southwest of the application area.
- *Stylidium longitubum* (Priority 4) – is known from 10 populations within the local area spread across approximately 7 kilometres. The closest species has been recorded approximately 690 metres northeast of the application area.

The DWER (2020) site inspection identified that the majority of the application area had already been cleared and devoid of native vegetation. The remaining section of the application area comprises of vegetation in degraded (Keighery, 1994) or completely degraded (Keighery, 1994) condition with a lot of disturbance in the form of rubbish dumping, and invasive weeds dominated the area that have suffocated most parts of native understorey vegetation. Noting this, the application area is not likely to provide habitat for any priority flora species.

The site inspection (DWER, 2020) observed a number of patches of vegetation within the road reserve and adjacent railway reserve (Figure 3), that appeared to be representative of 'Banksia Dominated Woodlands of the Swan Coastal Plain', listed as 'Priority 3(iii)' ecological community (PEC) by Department of Biodiversity, Conservation and Attractions (DBCA), and as an 'Endangered' threatened ecological communities (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The combined area of this vegetation is approximately 0.186 hectares, with less than 0.099 hectares being in the application area.



Figure 3 Areas of vegetation comprising of Banksia sp.

Three sections located in the centre of the Figure 3 have been impacted by a recent fire, and therefore, the vegetation condition could not be determined. However, based on the observation of the unburnt vegetation, the vegetation condition in these areas is in a degraded (Keighery, 1994) condition with a weedy understorey. The remaining sections of the potential Banksia woodland TEC were in degraded (Keighery, 1994) condition with weedy understorey. Considering this and the key diagnostic characteristics of the Banksia Woodland, which include minimum patch size and condition thresholds, the vegetation does not meet criteria to be classified as the Banksia Woodlands TEC.

In addition, Central Northern Darling Scarp Granite Shrubland Community listed as 'Priority 4(iv)' PEC by DBCA has been mapped approximately 9.1 kilometres southeast of the application area. This PEC is described as heath species typically consist of the taller shrubs *Xanthorrhoea acanthostachya* and *Allocasuarina humilis* over smaller proteaceous and myrtaceous shrubs, namely *Melaleuca* aff. *Scabra*, *Baeckea camphorosmae* and to a lesser extent, the proteaceous shrubs *Banksia armata*, *Hakea incrassata* and *Hakea undulata* (Department of Parks and Wildlife (DPaW), 2019). Noting the vegetation in the application area, the extent of the proposed clearing and the distance between the application area and the PEC, the proposed clearing is not likely to impact this PEC.

As discussed under Principle (b), the proposed clearing does not comprise the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

As discussed under Principle (c), the application area does not include, or is necessary for the continued existence of, threatened flora.

As discussed under Principle (d), the application area is not likely to comprise the whole or a part of, or is necessary for the maintenance of a state listed TEC.

Given the above, the application area does not comprise a high level of biodiversity, and therefore, the proposed clearing is not likely to be at variance with this principle.

The disturbance cause by the proposed clearing may impact adjacent native vegetation through an increase of weeds and dieback. Weed and dieback management practices will assist in mitigating this risk.

(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.

Proposed clearing may be at variance with this Principle

Delegated Officers Key Considerations

The proposed clearing may be at variance with this Principle as the application area contains:

- one tree containing two hollows suitable for black cockatoo nesting; and
- approximately 0.104 hectares of black cockatoo foraging habitat.

The applicant has provided the following mitigation measures to address impacts to black cockatoo habitat:

- Installation of two artificial nesting hollows within Railway Parade Road Reserve (PIN 11727298).

The Applicant will be required to install at least two artificial black cockatoo nest hollows within the Railway Parade Road reserve to mitigate impacts to black cockatoo nesting.

Noting no confirmed Carnaby's breeding locations within 12 kilometres of the proposed clearing and approximately 32 per cent of pre-European extent of native vegetation remains within the local area, the application area is not likely to provide significant foraging habitat for black cockatoos.

According to available databases, 25 conservation significant fauna species have been recorded within the local area (Department of Biodiversity Conservation and Attractions, 2007-). Of these species, it was determined that the three threatened black cockatoo species - forest red-tailed black cockatoo (*Calyptorhynchus banksia* subsp. *naso*), Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) (collectively known as black cockatoos), Quenda (*Isodon obesulus*), chuditch (*Dasyurus geoffroii*) and western swamp tortoise (*Pseudemydura umbrina*) has the potential to occur within the application area.

Suitable breeding habitat for black cockatoos includes trees which either have a suitable nest hollow or are 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). According to available databases, the application area is located outside of the mapped confirmed breeding area for Carnaby's cockatoo. The closest confirmed breeding tree is located approximately 19 kilometres north of the application area.

A site inspection undertaken by DWER officers (2020) identified one habitat tree with two spout type hollows within the application area. Therefore, the DWER requested the applicant to avoid the need for clearing this tree. The applicant (2020c) advised that the City had investigated the possibility of using localised crash barriers at the location of the breeding habitat tree, but it was not found to be a viable solution as there was not enough space to install the crash barrier to Australian Standards. This would eventually result in a significant hazard for road users. Noting this, the proposed clearing is likely to impact upon nesting habitat for the black cockatoo species.

In order to minimise the impacts to black cockatoo nesting habitat, the applicant committed to install two artificial black cockatoo nest hollows (Applicant, 2020c).

Foraging habitat for black cockatoos within seven kilometres of a breeding site is important to adequately support breeding pairs, and individual night roosting sites need food and water within six kilometres (EPA, 2019). Overlapping foraging ranges within 12 kilometres also support roosting sites and maintain habitat connectivity and movement across the landscape (EPA, 2019). Black cockatoos have a preference for foraging habitat that includes jarrah and marri woodlands and forest heathland and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp., and *Grevillea* sp. (Commonwealth of Australia 2012) and a range of introduced species, especially seeds from cones of *Pinus* species (Shah, 2006; Valentine and Stock, 2008). The DWER (2020) site inspection identified approximately 0.005 hectares of marri trees and around 0.099 hectares of *Banksia* sp. within the application area which comprises suitable foraging habitat for black cockatoos. Evidence of black cockatoo foraging was observed at a single location during the site inspection (DWER, 2020) by the way of chewed marri nuts.

As mentioned above, the application area is not located within the mapped confirmed breeding area for Carnaby's cockatoo, and according to available databases, there are no confirmed breeding points within the local area. The nearest confirmed breeding point is approximately 19 kilometres away. Given this, the application area is not likely to provide significant foraging habitat for black cockatoos breeding.

According to available databases, there are numerous confirmed roosting sites for black cockatoos that occur within the local area. Within a 6-kilometre radius of the application area, there are 12 confirmed roosting sites and approximately 32 per cent of pre-European extent of native vegetation remaining. Of these confirmed roosting sites, only two, located approximately 7.6 and 8.9 kilometres southwest of the application area, occurs within a conservation area, namely Gngangara-Moore River State Forest (Class A). The foraging habitat within the application area may provide some food to support roosting black cockatoos. However, based on the extent of the foraging habitat and the location of the confirmed roosting sites, the application area does not provide significant foraging habitat for black cockatoo. Noting this, the linear shape and the extent of the proposed clearing, and the

availability of food source in the near vicinity, the proposed clearing is not considered to significantly impact on the availability of food sources within the local area.

The chuditch is listed as vulnerable under both *Biodiversity Conservation Act 2016* (BC Act) and the EPBC Act. Chuditch are now only present in approximately five per cent of their pre-European range. Most chuditch are now found in varying densities throughout the jarrah forest and south coast of Western Australia. Chuditch use a range of habitats including forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest (Department of Environment and Conservation (DEC), 2012a).

Quenda is listed as priority 4 and are known to inhabit scrubby, swampy vegetation with low, dense understorey, located nearby water courses, pasture, or forest/woodland that is regularly burnt and is in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses (DEC, 2012b).

Noting that the understorey of the application area is largely devoid of native vegetation and the remaining parts comprise of vegetation in degraded (Keighery, 1994) to completely degraded (Keighery, 1994) condition, the application area is not likely to provide significant habitat for quenda, chuditch or any other ground dwelling fauna.

With relation to the western swamp tortoise, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. Habitat critical for the survival of this species includes land within the fox-proof fenced areas at Twin Swamps Nature Reserve and Ellen Brook Nature Reserve. The regulation and maintenance of the water quality and quantity of water within habitat is essential to avoid desiccation, maintain food production and allow for reproduction to occur (Department of the Environment, 2020a). The application area is mapped approximately 80 metres from the mapped western swamp tortoise. Noting the distance, presence of railway reserve and vegetation in degraded (Keighery, 1994) condition between these areas, and predominantly parkland cleared areas in the application area, the proposed clearing is not likely to impact this fauna species.

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

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

According to available databases, ten threatened flora species have been recorded within the local area. Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, the following four threatened flora species may occur within the application area:

- *Acacia anomala* – this species is known from 20 populations spread across approximately 9.5 kilometres; with the closest individual being recorded approximately 6.1 kilometres northeast of the application area. It grows over laterite in shallow sand, loam, clay or gravel that is brown, yellow or grey and typically occurs in low open woodland or forest dominated by *Eucalyptus marginata*, *E. wandoo*, *E. accedens* and *Corymbia calophylla*. Understorey heath is dominated by *Grevillea*, *Banksia*, *Hakea* and *Acacia* species (Department of the Environment, 2020b).
- Muchea Bell (*Darwinia foetida*) – is known from five populations from the local area spread across approximately 2.8 kilometres. The closest individual has been recorded approximately 7.9 kilometres northwest of the application area. The species inhabits grey-white sand on swampy, seasonally wet sites and is typically associated with winter-damp to wet clay under *Regelia inops* and *Kunzea recurva* tall shrubland, over Pink-flowered Myrtle (*Hypocalymma angustifolium*) low shrubland or low *Melaleuca* spp. shrubland (Department of Environment, 2020c)
- *Eleocharis keigheryi* – is known from six populations spread across approximately 8.7 kilometres in the local area; with the closest individual being recorded approximately 970 metres southwest of the application area. This flora species grows in small clumps in a substrate of clay or sandy loam and typically occur in fringing woodland species and associated species include Swamp Sheoak (*Casuarina obesa*), Flooded Gum (*Eucalyptus rudis*), Red Robin Bush (*Melaleuca lateritia*), Swamp Paperbark (*M. raphiophylla*), Common Spike-sedge (*Eleocharis acuta*), *Aponogeton hexatelpalus*, Veined Swamp Wallaby Grass (*Amphibromus nervosus*) and herbs such as *Wurmbea*, *Tribonanthes* and *Leptocarpus* spp. (Department of Environment, 2020d).
- *Grevillea curviloba* subsp. *curviloba* - occurs on typically winter wet, deep peaty grey sands over limestone at depth, and occurs with a suite of shrubs including *Acacia saligna*, *Melaleuca huegelii* and *M. systema* that are more commonly associated with limestone soils near the coast. The species is associated with the 'Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain' ecological community (Department of the Environment, 2020e).

The DWER (2020) site inspection identified that the majority of the application area had already been cleared and devoid of native vegetation. The remaining sections of the application area comprises of vegetation in degraded (Keighery, 1994) to completely degraded (Keighery, 1994) condition with invasive weeds dominating the understorey. Noting this, the application area is not likely to provide habitat for any threatened flora species.

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

According to available databases, six state listed TEC's have been mapped within the local area:

- *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. (1994)) is located approximately 1.9 kilometres southeast of the application area;
- Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994)) can be found approximately 1.8 kilometres southeast of the application area;

- Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain (floristic community type 15 as originally described in Gibson et al. (1994)) is located approximately 90 metres east of the application area.
- Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain can be found approximately 2.9 kilometres southwest of the application area,
- Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) is located approximately 9.1 kilometres northwest of the application area; and
- *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994)) can be found approximately 8.89 kilometres northeast of the application area.

The DWER (2020) site inspection identified that the majority of the application area had already been cleared and devoid of native vegetation with the remaining sections of the application area comprising of vegetation in degraded (Keighery, 1994) to completely degraded (Keighery, 1994) condition.

Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain TEC is mapped approximately 90 metres from the application area, however, no distinctive wetland vegetation types was recorded during the DWER site inspection, only sparse riparian species (DWER, 2020).

Given the above, the application area is not likely to comprise the whole or a part of, or is necessary for the maintenance of a state listed TEC.

(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 with 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 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is located within the ‘Swan Coastal Plain’ IBRA bioregion. This IBRA bioregion has approximately 32.5 per cent of its pre-European vegetation extent remaining (Government of Western Australia, 2019).

The application area is also mapped in the Yanga Swan Coastal Plain vegetation complex, which retains approximately 16.3 per cent pre-European extent.

The local area retains approximately 34 per cent of its pre-European vegetation extent.

Noting the vegetation observed during the site inspection (DWER, 2020) and the mapped vegetation complex, the vegetation in the application area is not considered to be representative of the Yanga Swan Coastal Plain vegetation complex. In addition, as discussed under Principle (a), (b), (c) and (d), the application the application area does not comprise a high level of biodiversity, does not provide significant habitat for conservation significant flora and fauna species and does not comprise of TEC or PEC.

Considering this, and that the majority of the application area had already been cleared and devoid of native vegetation, the application area is not considered a significant remnant of native vegetation within an extensively cleared area.

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

Table 1 Native vegetation statistics (Government of Western Australia, 2019)

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in DBCA Managed Lands (%)
IBRA Bioregion*				
Swan Coastal Plain	850,785.09	276,461.42	32.49	13.25
Swan Coastal Plain vegetation complex **				
Yanga Complex	26,176.45	4,268.78	16.31	2.00

(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 at variance to this Principle

Delegated Officers Key Considerations
The proposed clearing is at variance with this Principle as the application area contains vegetation growing in, or in association with a watercourse or a wetland.
The impact to riparian habitat is limited to scattered segments along the application area, and the proposed clearing is not expected to significantly impact on riparian habitat within the local area.
The applicant will be required to undertake weed and dieback management measures to reduce the risk of weeds and dieback spreading into mapped wetlands. These measures are outlined under Section 1.5.

According to available databases, Ellenbrook nonperennial minor river (ID 8172) intersects the application area in its central portion (Figure 4). No distinctive riparian vegetation types was recorded during the DWER (2020) site inspection, however riparian vegetation species were present in the road reserve.

In addition, the application area is mapped within the Ellen Brook Floodplain multiple use palusplain (ID 1792) and unknown resource enhancement palusplains ID 1351, 7607, 8699 and 8479 (Figure 4).

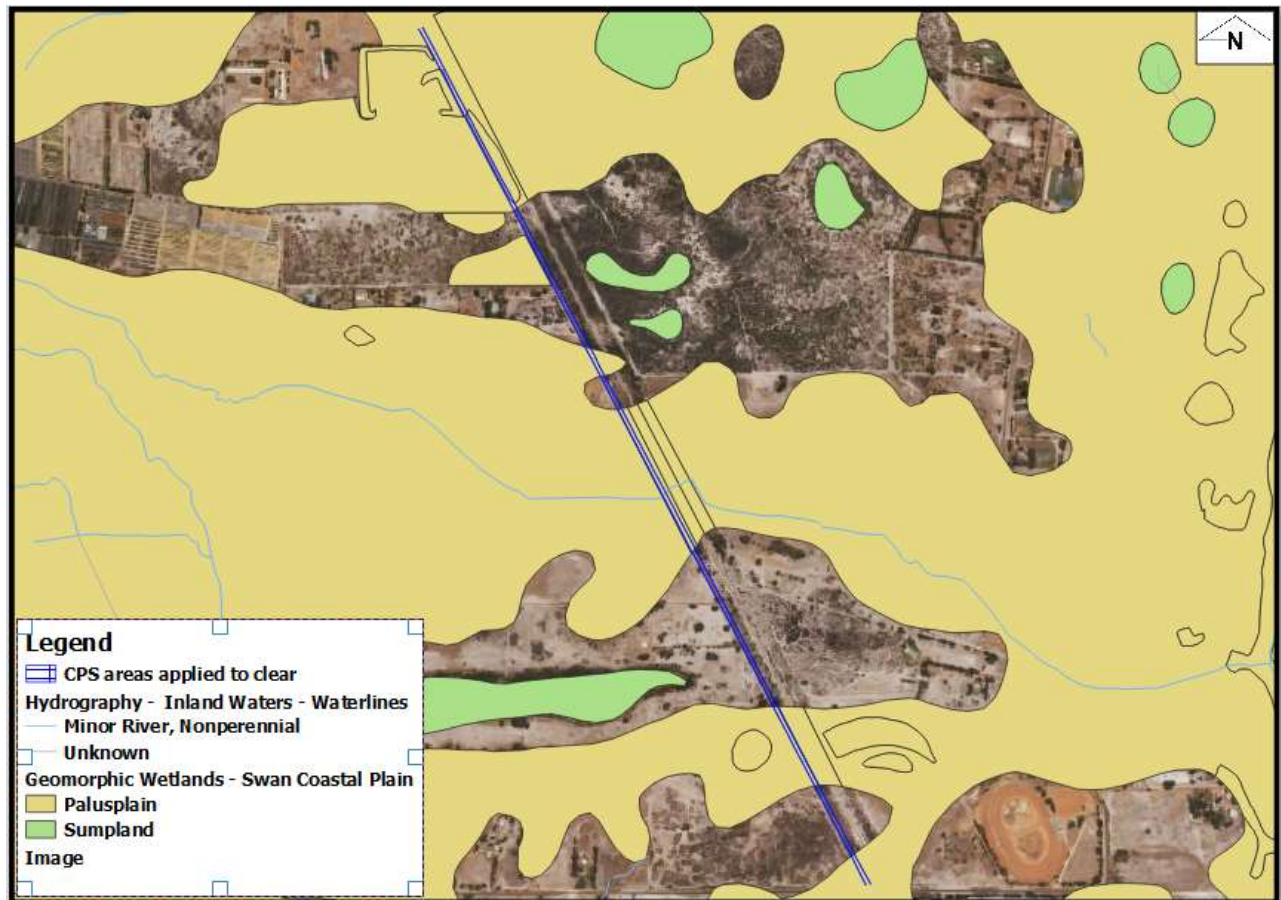


Figure 4 Wetlands and a watercourse mapped within the application area

As part of the vegetation proposed to be cleared is growing in, or in association with a watercourse or wetland, the proposed clearing is at variance with this principle. Noting, the extent, the linear nature of the proposed clearing, and the vegetation in the application area in a degraded (Keighery, 1994) to a completely degraded (Keighery, 1994) condition with invasive weeds dominated the area, the proposed clearing is not likely to have a significant impact upon riparian vegetation.

There is a risk of weeds and dieback spreading into the riparian vegetation within mapped wetlands and the applicant will be required to adhere to weed and dieback management measures (as conditioned on the clearing permit) to minimise this risk.

(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 with this Principle

Primary soils within the application area are mapped by the Department of Primary Industries and Regional Development (DPIRD) (2020). The four mapped soils within the application area are Yanga 8x Phase subsystem (approximately 29 per cent), Yanga 9x Phase (approximately 25 per cent), Yanga 14x Phase (approximately 35 per cent), and Yanga 7x Phase is (approximately 11 per cent) (discussed further under Section 2).

Table 2 Land degradation risk summary

Risk categories	Yanga 8x Phase	Yanga 9x Phase	Yanga 14x Phase	Yanga 7x Phase	Yanga 6x Phase
Wind erosion	>70% of map unit has a high to extreme wind erosion risk	10-30% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme wind erosion risk	3-10% of map unit has a high to extreme wind erosion risk	3-10% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a high to extreme water erosion risk	50-70% of map unit has a high to extreme water erosion risk	3-10% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme water erosion risk	>70% of map unit has a high to extreme water erosion risk
Salinity	30-50% of map unit has a moderate to high salinity risk or is presently saline	10-30% of map unit has a moderate to high salinity risk or is presently saline	3-10% of map unit has a moderate to high salinity risk or is presently saline	>70% of map unit has a moderate to high salinity risk or is presently saline	3-10% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	50-70% of map unit has a high subsurface acidification risk or is presently acid	10-30% of map unit has a high subsurface acidification risk or is presently acid	30-50% of map unit has a high subsurface acidification risk or is presently acid	<3% of map unit has a high subsurface acidification risk or is presently acid	3-10% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	>70% of the map unit has a moderate to high flood risk	>70% of the map unit has a moderate to high flood risk	50-70% of the map unit has a moderate to high flood risk	>70% of the map unit has a moderate to high flood risk	>70% of the map unit has a moderate to high flood risk
Water logging	>70% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a moderate to very high waterlogging risk	50-70% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk

Noting the figures above, the soils within the application are prone to flood risk, waterlogging and phosphorus export risk. However, the application area has relatively flat topography, and marginal groundwater salinity (Mayer, Ruprecht & Bari, 2005) mapped between 500 – 1000 total dissolved solids (milligrams per litre). Considering the topography of the application area, the porous nature of sandy soils observed within the application area (DWER, 2020), the linear shape and size of the proposed clearing, and relatively low rainfall, the proposed clearing is not likely to cause appreciable land degradation.

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

Delegated Officers Key Considerations

The proposed clearing may be at variance with this Principle as the proposed clearing will:

- Impact on approximately 0.06 hectares of vegetation within the Bush Forever site 400;
- Increase the risk of weeds and dieback spreading into the Bush Forever site 400.

Noting the minimal extent of vegetation proposed to be cleared in the Bush Forever site, the proposed clearing is not likely to have a significant impact on this conservation area.

Undertaking weed and dieback management measures will reduce the risk of weeds and dieback spreading into the Bush Forever site. These measures are outlined under Section 1.5.

According to available databases, seven conservation areas are mapped in the local area, being:

- Twin Swamps Nature Reserve (Class A) located approximately 80 metres east of the application area;
- Un-named crown land (Class A) located approximately 600 metres southwest of the application area;
- Ellen Brook Nature Reserve (Class A) located approximately 1.4 kilometres southeast of the application area;
- Walyunga National Park (Class A) located approximately three kilometres east of the application area;
- Gngangara-Moore River State Forest (Class A) located approximately 4.9 kilometres west of the application area;
- Neaves Road Nature Reserve (Class A) located approximately 8.8 kilometres northwest of the application area; and
- Bullsbrook Nature Reserve located approximately 9.5 kilometres northeast of the application area.

The DWER (2020) site inspection identified that majority of the application area had already been cleared and devoid of native vegetation. The remaining section of the application area comprises of vegetation in degraded (Keighery, 1994) to completely degraded (Keighery, 1994) condition. Noting this, and the distance between the application area and the conservation areas, the proposed clearing is not likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Approximately 0.06 hectares of vegetation in the application area is mapped within Bush Forever Site 400 (Twin Swamps Nature Reserve and adjacent bushland, Bullsbrook) (Figure 5). Noting the condition of the vegetation within the application area, its small size and that most of the application area has undergone historical disturbance, the proposed clearing is not likely to directly impact on the environmental values of this conservation area. However, the disturbance caused by the proposed clearing may indirectly impact on the Bush Forever Site via the introduction and spread of weeds and dieback. Weed and dieback management practices will assist in mitigating this risk.



Figure 5 Location of the application area in relation to Bush Forever Site 400

(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 with this Principle

According to available databases, one watercourse, being Ellenbrook non-perennial minor river (ID 8172), one multiple use palusplain, being Ellen Brook Floodplain (ID 1792) and unknown resource enhancement palusplains ID 1351, 7607, 8699 and 8479 have been mapped within the application area. While the proposed clearing may increase sedimentation and runoff into the watercourse, the impacts are likely to be minimal and short term and are not likely to cause deterioration in the quality of surface water.

Groundwater salinity within the application is mapped between 500 – 1000 milligrams per litre total dissolved solids which is considered to be marginal (Mayer, Ruprecht & Bari, 2005). Noting this, the extent of the proposed clearing and the condition of the vegetation within the application area, the proposed clearing is not likely to cause deterioration in the quality of underground water in the form of salinity.

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

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

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

The degradation summary (DPIRD, 2020) for the mapped subsystems notes that more than 70 per cent of these map units have high to extreme flood risk. However, noting the extent of the proposed clearing along the existing road, 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 with this Principle.

Planning instruments and other relevant matters.

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

The clearing permit application was advertised on the DWER website on 25 February 2020 with a 21 day submission period. No public submissions have been received in relation to this application.

The Applicant (2020) advised that the application is to reduce instances and severity of 'run off road – hit object' crash type due to high proportion of these crash types recorded by Main Roads between 2014 and 2018 as per recommendation of Road Safety Audit.

The Department of Planning, Lands and Heritage (DPLH) has advised that an offset package should be prepared and approved by DWER, prior to the clearing of any native vegetation, in accordance with WA Environmental Offsets Policy (2011) and guidelines and, with guidance from Appendix 4 of the State Planning Policy (SPP) 2.8. DPLH also recommends that the

development including installation, access and ongoing maintenance shall not result in any further disturbance or clearing of native vegetation other than the 0.06 ha proposed to be cleared (DPLH, 2020).

Under Clause 5.1.2.1 (i) (e) of SPP 2.8, proposals should support a general presumption against the clearing of regionally significant bushland or other degrading activities, except where a proposal or decision is consistent with the overall purpose and intent of the existing Crown reserve or can be reasonably justified with regard to wider environmental, social, economic or recreational needs, and all reasonable alternatives have been considered in order to avoid or minimise any direct loss of regionally significant bushland, and reasonable offset strategies are secured to offset any loss of regionally significant bushland, where appropriate and practical (Western Australian Planning Commission (WAPC), 2010).

The Delegated Officer had regard to the extent of the proposed clearing and the avoid and minimisation measures proposed by the applicant (as outlined above) and determined that the proposed clearing of 0.06 hectares of native vegetation in degraded to completely degraded condition is not likely to have a significant residual environmental impact on Bush Forever site 400. Consequently, it was determined that an offset is not required when considered in the context of the principles set out under the WA Environmental Offsets Policy (2011). Furthermore, the Delegated Officer considers that the proposed clearing is consistent with the overall purpose and intent of the existing reserve in accordance with SPP 2.8.

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GIS databases:

- CPS Areas applied to clear
- NatureMap (conservation significant fauna)
- DAFWA Subsystems V5
- Soils of WA
- Vegetation Complexes – Swan Coastal Plain
- Managed Tenure
- Environmentally Sensitive Areas
- TPFL Data March 2020
- WAHerb Data March 2020
- Aboriginal Sites Register
- IBRA Vegetation WA
- WA TECPEC
- Land Degradation Hazards