



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9813/1
File Number: DWERVT10591
Duration of Permit: From 10 March 2023 to 10 March 2035

PERMIT HOLDER

Shire of Toodyay

LAND ON WHICH CLEARING IS TO BE DONE

Chitty Road reserve (PIN: 11633672), Hoddy's Well

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.18 hectares of *native vegetation* or 18 native trees within the combined areas cross-hatched yellow on Figure 1a, Figure 1b and Figure 1c of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 10 March 2025.

2. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending 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.

3. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

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

4. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner towards adjacent *native vegetation* to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

5. Fauna management – black cockatoo habitat

- (a) Prior to undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1a, Figure 1b and Figure 1c of Schedule 1, the permit holder must engage a *fauna specialist* to conduct a *fauna survey* of the permit area to identify *black cockatoo habitat tree/s* being utilised by *black cockatoo species* listed below:
 - (i) *Zanda lateriosis* (Carnaby’s cockatoo);
 - (ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo); and
 - (iii) *Zanda baudinii* (Baudin’s cockatoo).
- (b) Where *black cockatoo habitat tree/s* are identified under condition 5(a), the permit holder must engage a *fauna specialist* to map *black cockatoo habitat tree/s* within the permit area.
- (c) Each *black cockatoo habitat tree* identified must be inspected by a *fauna specialist* for *evidence* of current or past breeding use by *black cockatoo species*.
- (d) Where a *black cockatoo habitat tree* with no *evidence* of current or past use by *black cockatoo species* is identified in accordance with condition 5(a), that tree must only be cleared immediately after the inspection.
- (e) Where a *black cockatoo habitat tree* is identified within the combined areas cross-hatched yellow on Figure 1a, Figure 1b and Figure 1c of Schedule 1 and that tree shows *evidence* of current or past breeding use by *black cockatoo species* under condition 5(c), and clearing of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.
- (f) Any *black cockatoo breeding tree* with *evidence* of current breeding use by *black cockatoo species* must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under condition 5(e).
- (g) For each *black cockatoo breeding tree* with *evidence* of current or past breeding use by *black cockatoo species* identified that cannot be avoided, the permit holder must install an artificial black cockatoo nest hollow.

- (h) Each artificial black cockatoo nesting hollow required by condition 5(g) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *black cockatoo habitat tree/s*.
- (i) The artificial black cockatoo nest hollow(s) required by condition 5(g) of this permit must:
 - (i) be installed within the area cross-hatched red on Figure 2 of Schedule 1;
 - (ii) be designed and placed in accordance with the specifications detailed in Schedule 2; and
 - (iii) be monitored and maintained in accordance with the specifications detailed in Schedule 3, for a period of at least ten years.
- (j) Within two months of clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1a, Figure 1b and Figure 1c of Schedule 1, the permit holder must provide the results of the *fauna survey* in a report to the CEO.
- (k) The *fauna survey* report must include the following;
 - (i) the location of the *black cockatoo habitat tree(s)* recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/20), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the location of any fauna species listed in condition 5(a), if identified, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iii) the name and amount of each fauna species identified;
 - (iv) whether the *black cockatoo habitat tree/s* identified show current or past use by black cockatoo species;
 - (v) the methodology, used to survey the permit area;
 - (vi) a photo of the *black cockatoo habitat tree(s)* identified; and
 - (vii) a description of the *black cockatoo habitat tree(s)* identified, including the:
 - (A) species of *black cockatoo habitat tree(s)*; and
 - (B) condition of the *black cockatoo habitat tree(s)*.

6. Revegetation and rehabilitation – Mitigation planting

The permit holder must within 12 months of undertaking clearing authorised under this permit:

- (a) undertake deliberate *planting* of at least 26 (twenty-six) trees within Chitty Road reserve (PIN: 11633672, Hoddy's Well, by;
 - i. ensuring only *local provenance* species are used;
 - ii. ensuring *planting* is undertaken at the *optimal time*;

- (b) undertake *weed* control and watering of *plantings* for at least three years post planting;
- (c) the permit holder must within 24 months of *planting* the 26 trees in accordance with condition 6(a) of this permit:
 - i. engage an *environmental specialist* to make a determination that the 26 trees will survive.
 - ii. if the determination made by the *environmental specialist* under condition 6(c)(i) that 26 trees will not survive, the permit holder must plant additional trees that will result in 26 trees persisting within Chitty Road reserve (PIN: 11633672, Hoddy’s Well).
- (d) where additional *planting* of trees is undertaken in accordance with condition 6(c), the permit holder must repeat the activities required by condition 6(a), 6(b) and 6(c) of this permit.

7. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/20), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 3; (g) actions taken in accordance with condition 4; (h) actions taken in accordance with condition 5; and (i) actions taken in accordance with condition 6

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
black cockatoo habitat trees	means trees that have a diameter, measured at 130 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for <i>Eucalyptus salmonophloia</i> or <i>Eucalyptus wandoo</i>) that contain hollows suitable for breeding by black cockatoo species.
black cockatoo species	means one or more of the following species: (a) <i>Zanda lateriosis</i> (Carnaby's cockatoo); (b) <i>Zanda baudinii</i> (Baudin's cockatoo); and/or (c) <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
dieback	means the effect of <i>Phytophthora</i> 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, or who is approved by the CEO as a suitable environmental specialist.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the CEO as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
local provenance	local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.

Term	Definition
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from May to July for undertaking planting.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; 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.

END OF CONDITIONS



Jessica Burton
A/MANAGER
NATIVE VEGETATION REGULATION

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

14 February 2023

SCHEDULE 1

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



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

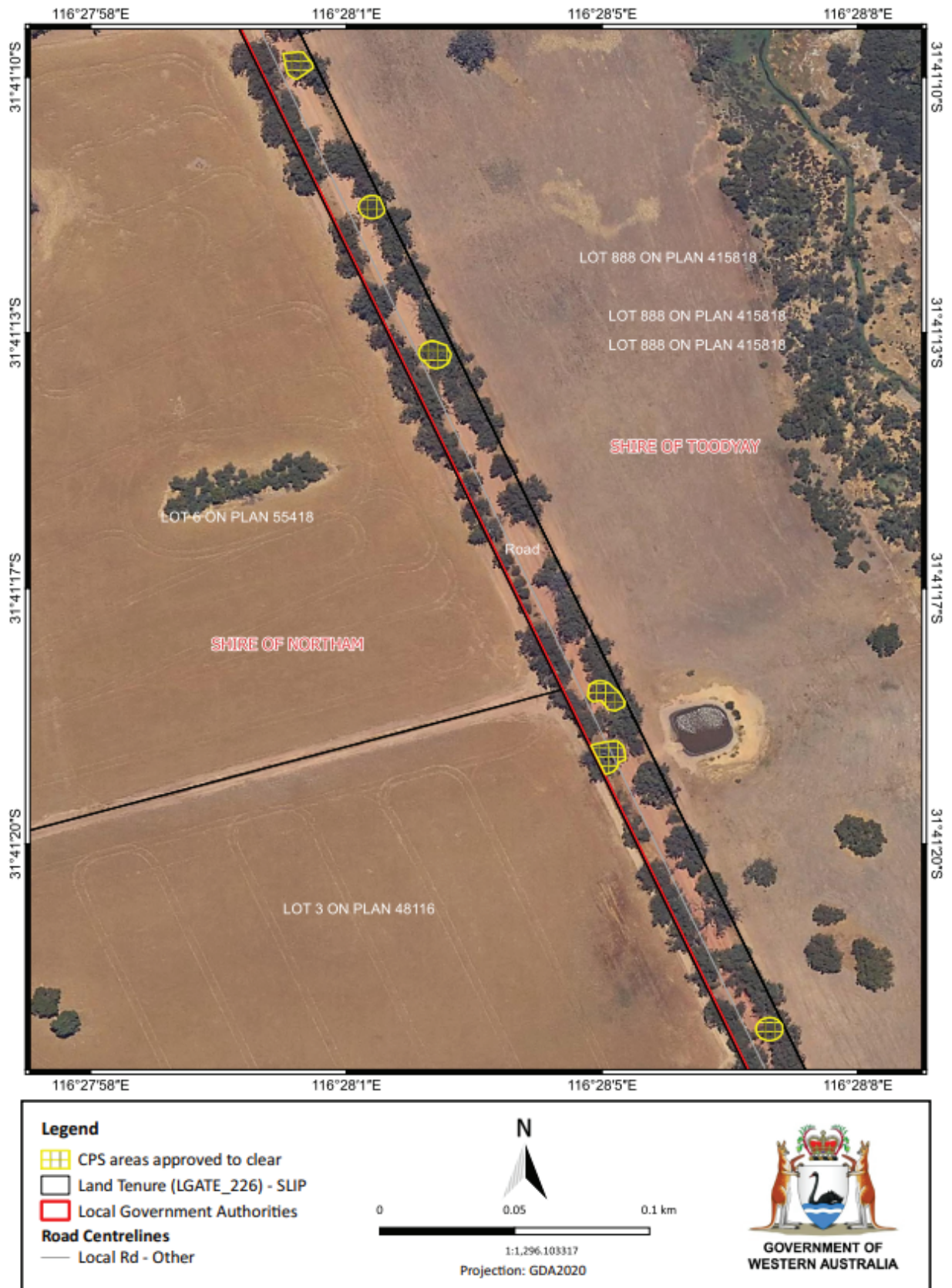


Figure 2(b): Map of the boundary of the area within which clearing may occur

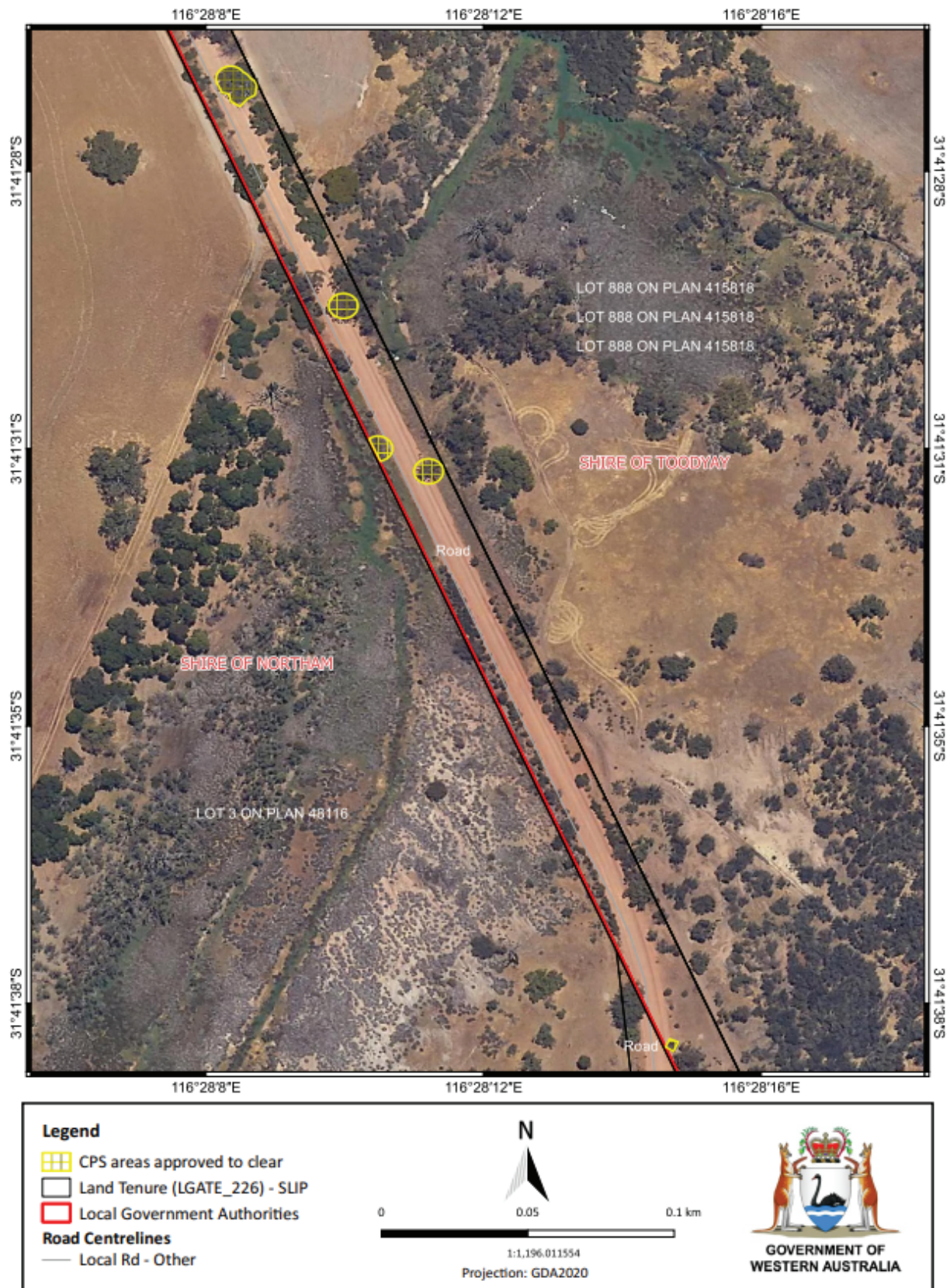


Figure 3(c): Map of the boundary of the area within which clearing may occur

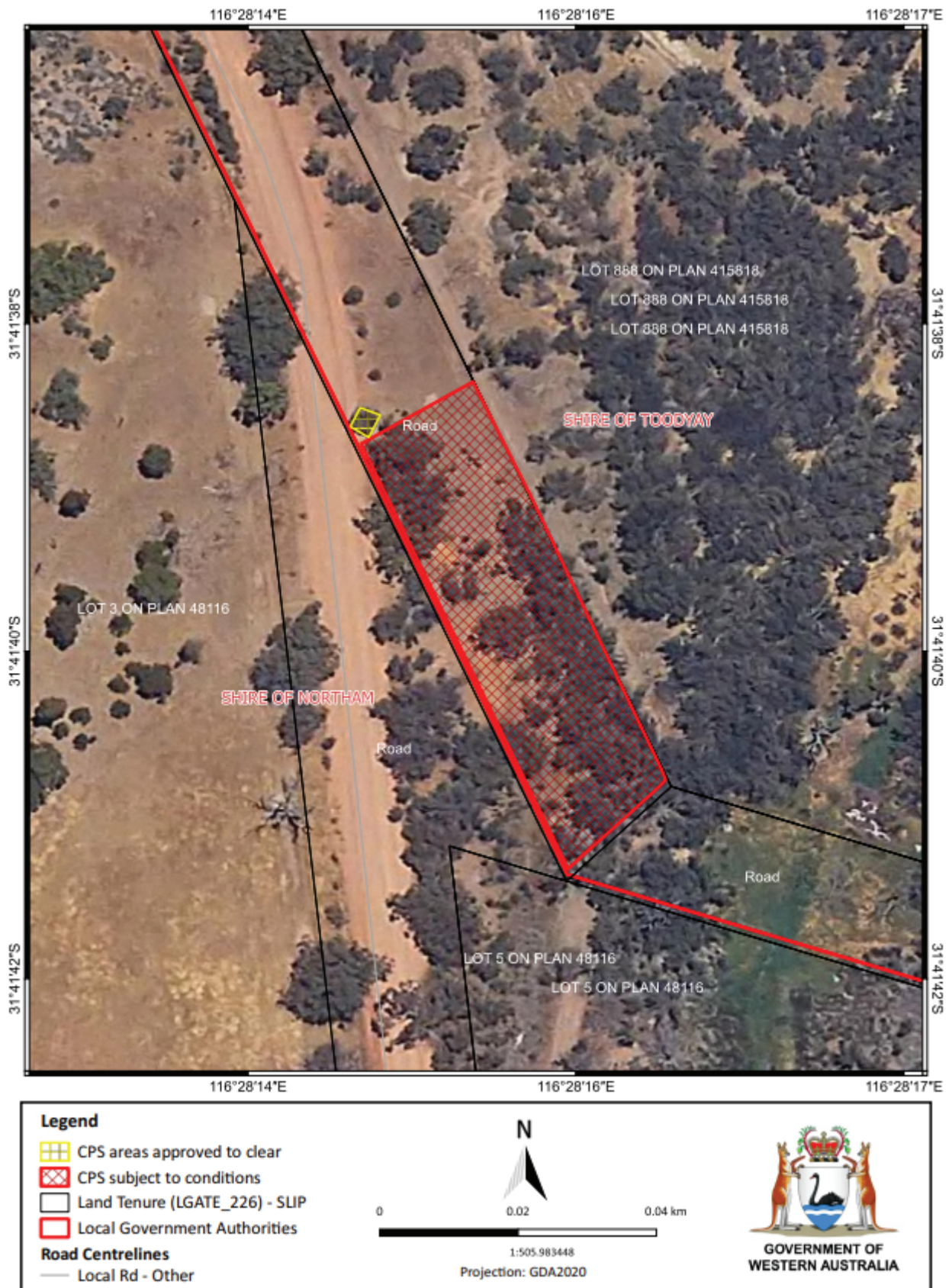


Figure 4: Map of the boundary of the area within which specific offset conditions apply

SCHEDULE 2

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

Artificial hollows for Carnaby's cockatoo



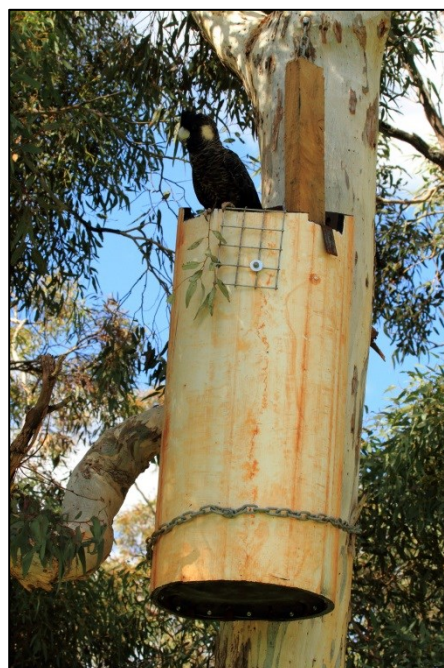
How to design and place artificial hollows for Carnaby's cockatoo

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

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

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

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



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

Walls

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

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

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

Base

The base of the artificial hollow must be;

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

Do not use:

- Saw dust or fibre products that will retain moisture.

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



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

Entrance

The entrance of the artificial hollow must;

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

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

Ladder

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

The ladder must be;

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

Do not use:

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

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

Sacrificial chewing posts

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

The sacrificial chewing posts must:

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

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



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

Photo by Rick Dawson

Mountings

The artificial hollows must be mounted such that:

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

Placement

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

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

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

Artificial hollows to be placed in trees require:

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

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

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

Safety

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

Maintenance and monitoring

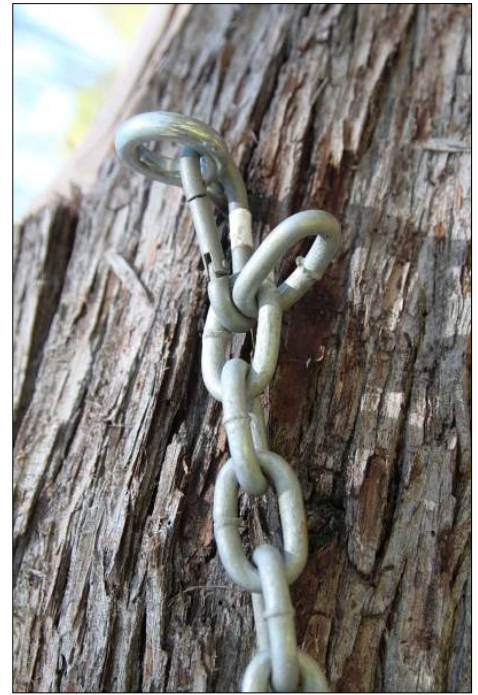
Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring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

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

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



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



Example fixing for artificial hollow
Photo by Christine Groom

Acknowledgements

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

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

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

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

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

SCHEDULE 3

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

Artificial hollows for Carnaby's cockatoo



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

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

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

Monitoring should be undertaken in order to detect:

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



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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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



Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

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

Acknowledgements

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

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Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9813/1
Permit type:	Area permit
Applicant name:	Shire of Toodyay
Application received:	14 July 2022
Application area:	18 native trees
Purpose of clearing:	Defining drains and culvert outlets and re-sheeting and sealing existing road
Method of clearing:	mechanical
Property:	Chitty road reserve (PIN: 11633672)
Location (LGA area/s):	Toodyay
Localities (suburb/s):	Hoddy's Well

1.2. Description of clearing activities

The Shire of Toodyay are proposing to clear 18 native trees along a 1.7 kilometre stretch of Chitty Road reserve for the purpose of defining drains and culvert outlets and re-sheeting and sealing existing road (see Figures 1 (a) to 1(c), Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	14 February 2023
Decision area:	18 native trees, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (the department) advertised the application for 21 days and three submissions were received. The consideration of the issues raised is in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix G.1), the findings of a black cockatoo assessment and a site inspection (see 0), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the clearing is to improve the safety of Chitty Road.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable habitat for black cockatoos and is significant as a remnant of native vegetation in an area that has been extensively cleared; and
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to unacceptable impacts to the environment.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- undertake deliberate planting of at least 26 trees of local provenance species within the adjacent vegetation to mitigate the loss of 18 trees within an extensively cleared landscape
- undertake pre-clearing inspection of tree hollows for evidence of breeding use by black cockatoos

1.5. Site map



Figure 1(a) Map of the application area

The areas cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.



Figure 1(b) Map of the application area

The areas cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

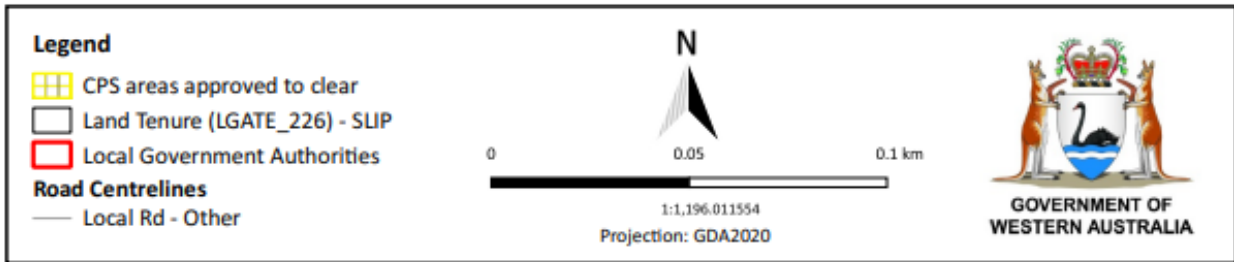
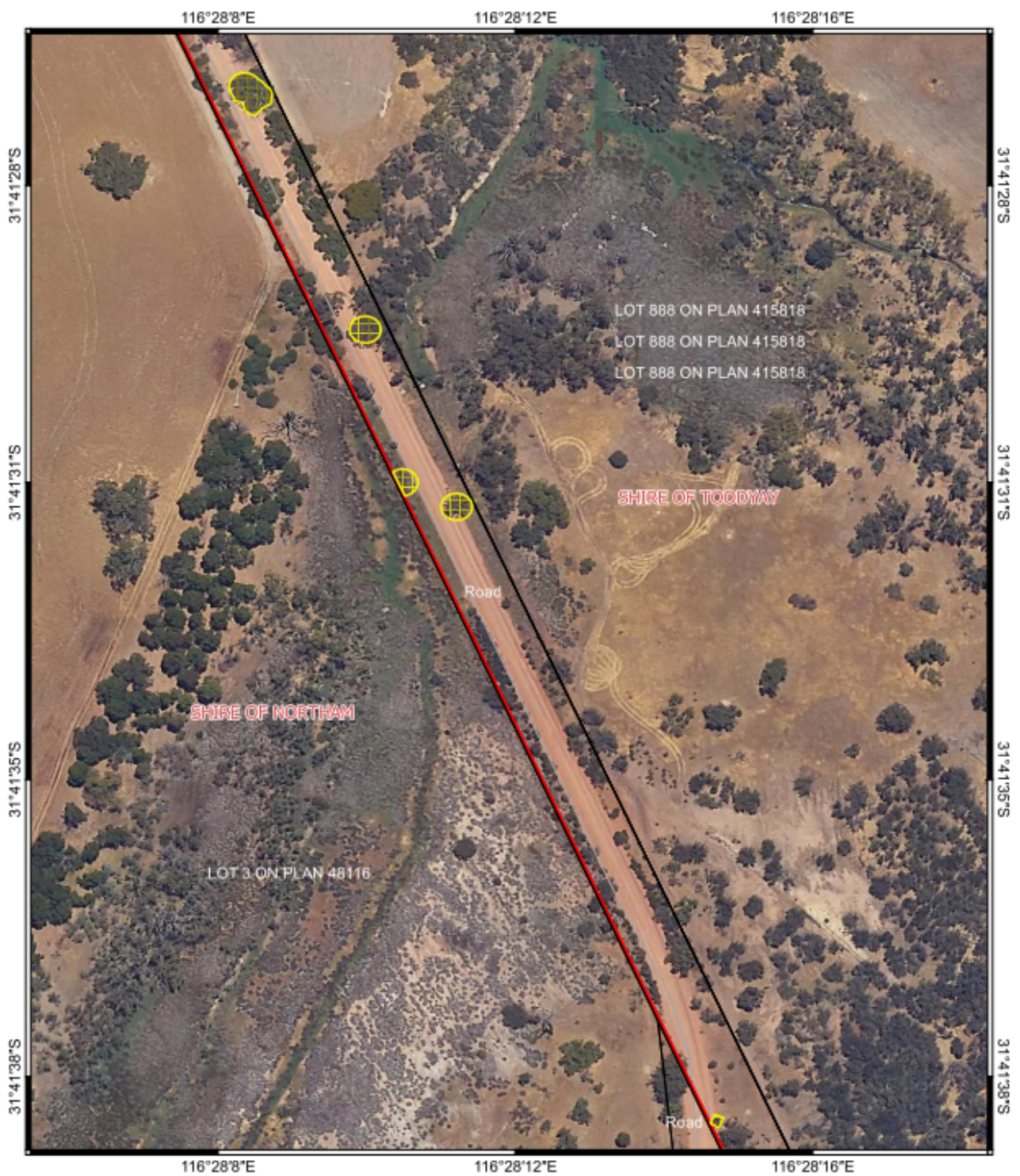


Figure 1(c) Map of the application area

The areas cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant (Shire of Toodyay, 2022a), demonstrating that the Shire has explored a number of engineering designs to reduce the proposed clearing however, given the proximity of trees to the edge of the road, there is a risk to motorists. Trees located too close to drainage culvert crossings need to be removed as there is not sufficient space to bypass open drains without the need of cutting roots and risking destabilising the trunks over time.

After consideration of avoidance and mitigation measures, it was determined that further avoidance and/or mitigation measures were required to counterbalance the significant residual impacts to black cockatoo habitat. To mitigate the loss of 18 trees, the Shire has committed to the planting of 26 native trees within the Chitty Road reserve (see Appendix A).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see **Error! Reference source not found.**) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to black cockatoo habitat and significant remnant vegetation. The consideration of these impacts, and the extent to which they can be managed through conditions, applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (biodiversity and fauna) - Clearing Principles (a) and (b)

Assessment

The application area is located within the Jarrah Forest IBRA region. According to available databases, a total of thirteen conservation significant fauna species have been recorded within the local area (10 kilometre radius of the application area). Of these, three species occur within freshwater and/or marine habitats not represented within the application area.

A site inspection by DWER in August 2022 identified that the vegetation along the Chitty Road reserve was largely consistent with the mapped vegetation types for the area; consisting of *Eucalyptus* spp. and *Corymbia calophylla* (marri) woodland. Given the lack of intact understory, the road reserve is not considered to provide permanent habitat for ground dwelling fauna species but is considered to provide habitat for black cockatoos and form an ecological linkage between remnants of native vegetation.

The application area is located within the mapped breeding distribution of Carnaby's cockatoo (*Zanda latirostris*, EN), the vagrant distribution of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*, VU) and just outside the distribution of Baudin's cockatoo (*Zanda baudinii*, EN). Black cockatoo habitat varies slightly between species, but can be considered in terms of breeding habitat, night-roosting habitat, and foraging habitat (Commonwealth of Australia 2012). Available databases indicate Carnaby's cockatoo are locally common with over 70 records across the local area. A total of three records of Baudin's cockatoo, four records of forest red-tailed black cockatoo and 27 records of 'white-tailed black cockatoo' (either Carnaby's cockatoo or Baudin's cockatoo) occur within the local area.

The site inspection (DWER, 2022) indicated that the application area may contain suitable breeding and foraging habitat for black cockatoos, in particular, Carnaby's cockatoo. Of the 18 trees proposed to be cleared, three were identified as potentially suitable breeding trees for black cockatoos. Upon request from the department (DWER, 2022), a black cockatoo habitat assessment was conducted for the three trees (Natural Area, 2022).

The black cockatoo assessment described the vegetation as degraded Eucalypt Woodland over native shrubs, herbs and introduced grasses. The vegetation within the application area was considered to provide high-quality native foraging habitat for black cockatoos and was assigned a score of 8 using the Black Cockatoo foraging quality scoring tool (DAWE, 2022). During the survey, Baudin's cockatoos were observed flying over, however no evidence of foraging was observed (Natural Area, 2022). It is acknowledged that, according to available databases, there is approximately 13,000 hectares of potential black cockatoo foraging habitat remaining within the local area, of which the application area comprises approximately 0.001 per cent. A number of conservation reserves also persist within 10 kilometres of the application area, including Clackline Nature Reserve, Woondowing Joondalup Nature Reserve, and Bobakine Nature Reserve, which are likely to provide larger areas of higher quality foraging habitat for black cockatoo species.

Food resources within the range of breeding sites and roost sites are important to sustain populations of black cockatoos. Black cockatoos will generally forage up to 12 kilometres from an active breeding site. Following breeding, they will flock in search of food, usually within six kilometres of a night roost, but may range up to 20 kilometres (DAWE, 2022). Within the local area, one roost site is recorded 6.56 kilometres from the application area, and a total of nine 'white-tailed black cockatoo' breeding sites are recorded, with the closest record, 2.8 kilometres from the application area. Noting the above, the trees proposed to be cleared are an important foraging resources for black cockatoos.

Breeding habitat for species of black cockatoos is described within the 'EPBC Act referral guidelines for threatened black cockatoo species' (DAWE, 2022) which includes a list of trees species known to support breeding 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, suitable DBH is 500 mm. The black cockatoo habitat assessment identified potential breeding hollows within three of the four *Eucalyptus wandoo* (wandoo) trees assessed (Natural Area, 2022). Following the Bamford habitat tree grading, these three trees were given a grading value of 3: *potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m)* (Figure 4; Natural area, 2022).

Noting the application area contains trees of suitable DBH to develop a nest hollow, trees with suitably sized hollows, and is within the foraging distance of known roosts and breeding sites, the clearing of 18 trees over the 1.7 kilometre stretch of the application area is considered to provide potential breeding habitat for black cockatoos within the local area.

While the area proposed to clear contains trees and no understory, it is considered that these trees would contribute to a local linkage for fauna species along the road reserve. Given areas adjacent to the application area are mostly cleared of vegetation for farming, this linkage is valuable to support the movement of fauna between the patchwork of remnant vegetation across the local landscape.

To mitigate the loss of 18 trees, the Shire has proposed to plant 26 trees within the Chitty Road reserve (Shire of Toodyay, 2023), to ensure the clearing will not contribute to the decline of black cockatoo foraging habitat or the reduction in ecological linkage function within the local area (see Appendix A). The department has assessed the suitability of this mitigation measure. The mitigation planting proposed was input into the WA Environmental Offsets Metric Calculator to determine the ratio required to mitigate the loss of 18 trees. From this, 26 trees were determined to be a suitable mitigation measure. A significant residual impact does not remain following the mitigation planting. The department considers that the mitigation planting aligns with the *WA Environmental Offset Policy* (2011) and *WA Environmental Offsets Guideline* (2014).

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of significant black cockatoo foraging and potential breeding habitat and vegetation that contributes to a local linkage across the patchwork of remnant vegetation within the local area. The planting of 26 trees within the road reserve will mitigate the impacts to the loss of black cockatoo habitat. To reduce the risk of impact to black cockatoo individuals present at the time of clearing, pre-clearing inspection of tree hollows for evidence of use by black cockatoos will be required.

The proposed clearing and associated clearing activities have the potential to introduce weeds and dieback into the surrounding vegetation which may lead to further loss in quality of vegetation.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoidance and minimisation
- weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation.
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- undertake pre-clearing inspection of tree hollows for evidence of breeding use by black cockatoos and installation of artificial hollows
- undertake planting of 26 trees within the Chitty Road reserve (PIN: 11633672)

3.2.2. Significant remnant vegetation - Clearing Principle (e)

Assessment:

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 (i.e. pre-European settlement) (Commonwealth of Australia, 2001). This is the threshold level below which species loss appears to accelerate exponentially at an ecosystem level.

The application area falls within the 'Jarrah Forest' IBRA region within the Coolakin and Michibin vegetation complexes that retain 39.15 and 25.59 per cent of their pre European extent, respectively. The site visit (DWER, 2022) identified the vegetation within the application area is largely representative of these vegetation complexes. A review of available databases determined that the local area retains approximately 37.54 per cent of its pre-European native vegetation extent.

The extent of vegetation remaining for the Michibin complex is inconsistent with the national objectives. While the vegetation within the local area is above the recommended 30 per cent threshold (Commonwealth of Australia, 2001), the target of 30 per cent representation within a bioregion does not take into account the effect of habitat fragmentation and isolation. Representation levels may need to be increased considerably above 30 per cent in already fragmented landscapes in order to maintain biodiversity. Due to the highly fragmented nature of the vegetation within the local area and the linkage function the vegetation within the application area provides, the proposed clearing area is considered significant as a remnant in an extensively cleared landscape.

Conclusion:

As discussed within Section 3.2.1, the application area includes significant habitat for black cockatoo species and forms a local linkage across the patchwork of remnant vegetation within the local area. Given this, the vegetation within the application area is significant as a remnant in an extensively cleared landscape.

The proposed clearing and associated clearing activities have the potential to introduce and/or spread weeds and dieback into the surrounding vegetation which may lead to further loss in quality of vegetation.

To mitigate the loss of 18 trees, the Shire has proposed to plant 26 trees within the Chitty Road reserve, to ensure the clearing will not contribute to the decline of vegetation within the local area (see Appendix A).

Conditions:

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoidance and minimisation
- weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation
- undertake planting of 26 trees within the Chitty Road reserve (PIN: 11633672)

3.3. Relevant planning instruments and other matters

Several Aboriginal sites of significance have been mapped within the local area, none within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Additional information provided by applicant

During the assessment, the applicant responded to a request for information on the following (see below).

Request for information	Further information provided
Further information on <ul style="list-style-type: none"> avoidance and mitigation and, the quality of black cockatoo habitat 	The Shire provided an adequate response that included a Black cockatoo habitat assessment (Natural Area, 2022). This has been included in the detailed assessment of impacts to biological values (see section 3.2.1)
Further information on avoidance and mitigation	The Shire provided an adequate response that included additional avoidance, minimisation and mitigation measures, including mitigation planting of 26 trees within the Chitty Road reserve (Shire of Toodyay, 2023). This information has been considered in the avoidance and mitigation measures (see Section 3.1).

Appendix B. Details of public submissions

Three public submissions were received in relation to the proposed clearing (Submissions, 2022a, 2022b, 2022c). As the submissions raised similar concerns, the comments have been combined to provide a streamlined response.

Summary of comments	Consideration of comment
The woodland in this area often comprise part of the threatened ecological community known as the Eucalyptus Woodlands of the Western Australian Wheatbelt (Submissions 2022a).	The area proposed to be cleared does not intersect any mapped Priority or Threatened Ecological Communities. Due to the degraded condition of the understory, the vegetation within the application area does not represent a Threatened Ecological Community (see Appendix D).
<p>The trees are located less than 4km from confirmed nesting hollows for the EPBC listed threatened species of black cockatoos.</p> <p>Large wandoo are an irreplaceable asset for the threatened species of our region as it takes several hundred years to reach a size suitable to create hollows for our native wildlife and to provide the function required to sustain a resilient woodland. Taking these trees should be avoided rather than offset as new plantings result in a net loss of hollow bearing trees.</p> <p>It is based on the above reasons since suitable habitat is present for 3 species of endangered black-cockatoos, “critically endangered” Baudin’s, “endangered” Carnaby’s and “vulnerable” Forest Red-tailed that the clearing not be permitted at all or be altered accordingly to retain suitable trees especially if they contain hollows. It is paramount to the survival of the black cockatoos that nesting hollows AND foraging food sources are considered in this application for assessment. (Submissions, 2022a; Submissions, 2022b).</p>	<p>During the assessment the applicant provided additional information in the form of a black cockatoo habitat assessment report (Natural area, 2022) and further mitigation measures (planting of 26 trees within the road reserve).</p> <p>The black cockatoo habitat assessment results and the potential for impacts to threatened fauna species including black cockatoo species were considered under the <i>Assessment of impacts on environmental values</i> (see Section 3.2).</p> <p>Where suitable hollows are identified during pre-clearance inspections, the Shire will be placing artificial hollows in an adjacent reserve.</p>
The proposed clearing will be the unnecessary removal of five old growth habitat trees from a low use rural road. It is already the required width and has good drainage with movement of excess water downhill.	The reason for the proposed clearing and the Shire’s avoidance and mitigation measures were provided under the <i>Avoidance and mitigation measures</i> (see Section 3.1) and considered in the <i>Reason for decision</i>

Summary of comments	Consideration of comment
There is cleared farmland on both sides and the road verge with its narrow strip of trees forms an important corridor as well habitat for wildlife to move to the scattered bush areas (Submissions, 2022c).	(see Section 1.4) and <i>Assessment of impacts on environmental values</i> (see Section 3.2). The proximity of trees to the edge of the road, there is a risk to motorists.

Appendix C. Site characteristics

C.1. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to the department at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

Characteristic	Details
Local context	<p>The areas proposed to be cleared is located along Chitty Road reserve, within the intensive land use zone of the Wheatbelt region of Western Australia. It is surrounded by rural industry, farms, dwellings and patches of intact remnant native vegetation.</p> <p>Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 37.54 per cent of the original native vegetation cover.</p>
Ecological linkage	The proposed clearing areas are not located within any mapped formal ecological linkages. Due to the highly fragmented nature of the surrounding vegetation, it is likely that the vegetation within the proposed clearing areas provides a local linkage for fauna between patches of remnant vegetation.
Conservation areas	The application area is not located within a conservation area. Clackline Nature Reserve is the closest conservation area, located 1.15 kilometres east of the application area.
Vegetation description	<p>Photographs supplied by the applicant and a site inspection (DWER, 2022) indicate the vegetation within the proposed clearing areas is consistent with the mapped vegetation types for the application area:</p> <ul style="list-style-type: none"> • Coolakin 51: Woodland of <i>Eucalyptus wandoo</i> with mixtures of <i>Eucalyptus patens</i>, <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> and <i>Corymbia calophylla</i> on the valley slopes in arid and perarid zones. • Michibin 185: Open woodland of <i>Eucalyptus wandoo</i> over <i>Acacia acuminata</i> with some <i>Eucalyptus loxophleba</i> on valley slopes, with low woodland of <i>Allocasuarina huegeliana</i> on or near shallow granite outcrops in arid and perarid zones. <p>The DWER site inspection identified Woodland of <i>Eucalyptus wandoo</i>, <i>Eucalyptus loxophleba</i>, <i>Corymbia calophylla</i> over tall open <i>Allocasuarina huegeliana</i> and <i>Acacia acuminata</i> shrubland. The application area was devoid of native understorey species, largely dominated by weeds (DWER, 2022).</p> <p>The mapped vegetation types retain approximately 39.15 and 25.59 per cent (respectively) of the original extent (Government of Western Australia, 2019).</p> <p>Representative photos are available in Appendix F.</p>
Vegetation condition	Photographs supplied by the applicant and a DWER site inspection indicate the vegetation within the proposed clearing areas is in good to degraded condition (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix F.
Climate and landform	The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters. The region has an average rainfall of 427.3 mm pa, with rain falling predominantly between June and August.

Characteristic	Details	
Soil description	The proposed clearing areas falls across three mapped soil types:	
	Williams Subsystem (Boyagin)	Valley floors of the major tributary streams in the western part of the survey area.
	Pindalup 4 Phase	Valley floors with imperfectly drained yellow duplex soils and yellow and brown massive earths.
	Leaver Subsystem	Gravelly slopes and ridges of the western Darling Plateau. Gravelly yellow and red duplexes, gravelly deep clayey sands and sandy loams over laterite and clay.
Land degradation risk	The majority of the soil types mapped for the application area and local extent have a low risk of land degradation from water and wind erosion, salinity, waterlogging and phosphorus export. The soils are mapped as having a high risk of land degradation from phosphorus export.	
Waterbodies	The desktop assessment and aerial imagery indicated that two minor, non-perennial watercourses occur adjacent to the areas proposed to be cleared.	
Hydrogeography	The proposed clearing areas is within the Avon River Catchment Area proclaimed under the RIWI Act. Water degradation risk in the Basin is mostly associated with nutrient load due to agricultural practices (Department of Water, 2015).	
Flora	Twenty flora records within local area, including one threatened and nineteen priority species. Of these 14 occur on the same soil type. The closest record is <i>Cyanicula ixioides</i> subsp. <i>ixioides</i> (P4) located 1.2 kilometres from the application area. The application area is devoid of native understorey.	
Ecological communities	The proposed clearing area does not intersect any mapped Priority or Threatened Ecological Communities. There are multiple occurrences of the Eucalypt Woodlands TEC within the local area, the closest is 6.25 kilometres from the application area. The application area is not representative of this community.	
Fauna	Thirteen conservation significant fauna species within the local area, the closest is a record of a chuditch (<i>Dasyurus geoffroi</i>), 1.95 km from the application area. The proposed clearing areas are located within the known feeding and breeding area of Carnaby black cockatoos, and with the vagrant habitat for forest red-tailed black cockatoos. The nearest black cockatoo breeding location is 2.7 kilometres north of the application area. A black cockatoo habitat assessment identified three potential breeding trees and no evidence of foraging by black cockatoos within the application area (Natural area, 2022).	

C.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Jarrah forest	4,506,660.25	2,399,838.15	53.25	1,673,614.25	37.14
Vegetation complex**					
Coolakin 51	163,991.68	64,204.65	39.15	33,002.38	20.12
Michibin 185	168,040.13	42,996.09	25.59	8,512.22	5.07
Local area					
10km radius	34,897.72	13,101.55	37.54	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

C.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), vegetation photographs (Shire of Toodyay, 2022b) and a site inspection (DWER, 2022), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Cyanicula ixiooides</i> subsp. <i>ixiooides</i>	P4	Y	Y	Y	1.20	2	N
<i>Sowerbaea multicaulis</i>	P4	Y	Y	Y	1.27	1	N
<i>Lasiopetalum trichanthera</i>	P2	N	Y	N	2.71	11	N
<i>Hemigenia platyphylla</i>	P4	N	Y	N	3.76	1	N
<i>Grevillea candolleana</i>	P2	Y	Y	Y	3.97	17	N
<i>Eucalyptus loxophleba</i> x <i>wandoo</i>	P4	Y	Y	Y	5.02	3	N
<i>Acacia aphylla</i>	T	N	Y	N	5.02	7	N
<i>Asterolasia grandiflora</i>	P4	N	Y	N	5.15	4	N
<i>Stylidium striatum</i>	P4	Y	Y	Y	6.32	2	N
<i>Asteridea gracilis</i>	P3	Y	Y	Y	7.22	1	N

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

C.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), a cockatoo habitat assessment (Natural area, 2022) and a site inspection (DWER, 2022), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Dasyurus geoffroyi</i> (chuditch)	VU	N	Y	1.95	1	N
<i>Zanda latirostris</i> (Carnaby's cockatoo)	EN	Y	Y	2.37	70	Y
<i>Calyptorhynchus</i> sp. 'white-tailed black cockatoo' (white-tailed black cockatoo)	VU	Y	Y	2.79	26	Y
<i>Macrotis lagotis</i> (bilby)	VU	N	N	3.72	3	N
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	Y	3.95	4	Y
<i>Falco peregrinus</i> (Peregrine falcon)	OS	Y	Y	4.47	12	N
<i>Leipoa ocellata</i> (malleefowl)	VU	N	N	4.69	7	N
<i>Zanda baudinii</i> (Baudin's cockatoo)	EN	Y	Y	5.51	3	Y
<i>Idiosoma schoknechtorum</i> (Mortlock River shield-backed trapdoor spider)	P3	Y	Y	6.32	8	N
<i>Notamacropus Irma</i> (western brush wallaby)	P4	N	N	9.31	1	N

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

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is not considered likely to contain any conservation significant flora or assemblages of plants (DWER 2022). However, the application area does contain habitat for black cockatoos.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains foraging and potential breeding habitat for black cockatoo species.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>Given the proposed clearing is for 18 individual trees, and the lack of understory across the road verge vegetation, the area proposed to be cleared is unlikely to contain Threatened flora (DWER, 2022).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not intersect any mapped Priority or Threatened Ecological Communities. Due to the degraded condition of the understory, the vegetation within the application area does not represent a Threatened Ecological Community.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type within the application area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is considered to provide an ecological linkage function for fauna.</p> <p>To mitigate the above, the Shire of Toodyay have committed to the planting of 26 trees within the Chitty Road reserve (Shire of Toodyay, 2023).</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area (1.5 kilometres east), the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Given no wetlands, and only two minor non-perennial water courses are recorded adjacent to the application area, the proposed clearing is unlikely to impact an environment associated with a watercourse or wetland.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are highly susceptible to land degradation from Eutrophication (phosphorus export). Eutrophication is not likely to be a risk in consideration of the final land use as a public road. Noting this, and the extent of the application area and the mitigation planting, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>Given the application is to clear 18 individual trees, and only two occur near a watercourse (non-perennial tributary of Avon River), it is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p> <p>Given only two of the 18 trees to be cleared are located near a watercourse (non-perennial tributary of Avon River), and no wetlands are recorded the application area, the proposed clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.

Condition	Description
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Biological survey information excerpts (Natural area, 2022) and site inspection report (DWER, 2022)







Location	Site visit photographs (DWER, 2022)	
SLK 0004.50 Lat/Long: -31.679821, 116.463785		
SLK 0005.58 Lat/Long: -31.688857, 116.468197		
SLK 0005.78 Lat/Long: -31.690554, 116.469006		

Figure 2. Potential black cockatoo breeding trees identified during the site visit (DWER, 2022)



Figure 3. Potential black cockatoo habitat trees surveyed (Natural area, 2022)

Table 3: Bamford (2016) habitat tree grading

Class	Description of Trees and Hollows/ Activity
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow
2	Hollow of suitable size and angle (i.e. near vertical) visible with chew marks around entrance
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10 m)
4	Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows are not vertical or near vertical; thus, a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by Black Cockatoos
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown

Figure 4. Habitat tree grading (Natural area, 2022)

Appendix G. Sources of information

G.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available

- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

G.2. References

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