GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9812/1

File Number: DWERVT10584

Duration of Permit: From 09 April 2023 to 09 April 2035

PERMIT HOLDER

Shire of Toodyay

LAND ON WHICH CLEARING IS TO BE DONE

Julimar Road Reserve (PINs 11693088, 11727409 and 11727410), Julimar

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.21 hectares of *native vegetation* within the area cross-hatched yellow in 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 09 April 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 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect the tree listed in Table 1 below, for:

Table 1: location of potential breeding tree within the application with potentially suitable hollow

Location	Latitude	Longitude
Julimar Road (PIN 11727410)	-31.50298	116.28284

(i) suitability as a *black cockatoo habitat tree* for use as breeding by *black cockatoo species*; and

(ii) evidence of current or past breeding use by *black cockatoo species*.

(b) Where a *black cockatoo habitat tree* within Table 1 shows no *evidence* of current or past use by *black cockatoo species*, that tree must only be cleared immediately after the inspection.

(c) Where a *black cockatoo habitat tree* within Table 1 shows *evidence* of current or past breeding use by *black cockatoo species*, and clearing of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.

(d) Any *black cockatoo breeding tree* within Table 1with *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(c).

(e) For each *black cockatoo breeding tree* within Table 1 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.

(f) Each artificial black cockatoo nesting hollow required by condition 5(e) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *black cockatoo habitat tree/s.*

(g) The artificial black cockatoo nest hollow(s) required by condition 5(e) 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.

(h) Within two months of clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must provide the results of the *fauna survey* in a report to the *CEO*.

(i) 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 *black cockatoo species*, 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* identified show current or past use by black cockatoo species;

(v) a description of the inspection methodology employed by the fauna specialist;

(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 30 (thirty) trees within Julimar road reserve (PINs 11693088, 11727409 and 11727410), Julimar, by;

i. ensuring only *local provenance* species are used;

ii. species provide foraging and potential breeding habitat for *black cockatoo species; and*

iii. 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 30 trees in accordance with condition 6(a) of this permit:

i. engage an *environmental specialist* to make a determination that the 30 trees will survive.

ii. if the determination made by the *environmental specialist* under condition 6(c)(i) that 30 trees will not survive, the permit holder must plant additional trees that will result in 30 trees persisting within Julimar road reserve (PINs 11693088, 11727409 and 11727410), Julimar.

(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	(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 *weeds* and *dieback* in accordance with condition 3; (g) actions taken in accordance with condition 4; and (h) actions taken in accordance with condition 5.
2.	In relation to the actions required under condition 6	(a) the tree species planted; (b) the location where the tree species planted occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020

No.	Relevant matter	Specifications
		(GDA94/20), expressing the geographical coordinates in Eastings and Northings; (c) a copy of the *environmental specialist's* report; (d) a description of the activities undertaken; and (e) any remedial actions required to be undertaken.

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

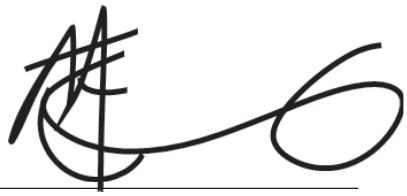
In this permit, the terms in Table 2 have the meanings defined.

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 *Eucalyptus salmonophloia* or *Eucalyptus wandoo*) that contain hollows suitable for breeding by black cockatoo species.
black cockatoo species	means one or more of the following species: (a) *Zanda lateriosis* (Carnaby's cockatoo); (b) *Zanda baudinii* (Baudin's cockatoo); and/or (c) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
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 *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
dieback	means the effect of *Phytophthora* species on native vegetation.
EP Act	*Environmental Protection Act 1986* (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 *Biodiversity Conservation Act 2016*.

Term	Definition
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.
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 – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

16 March 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

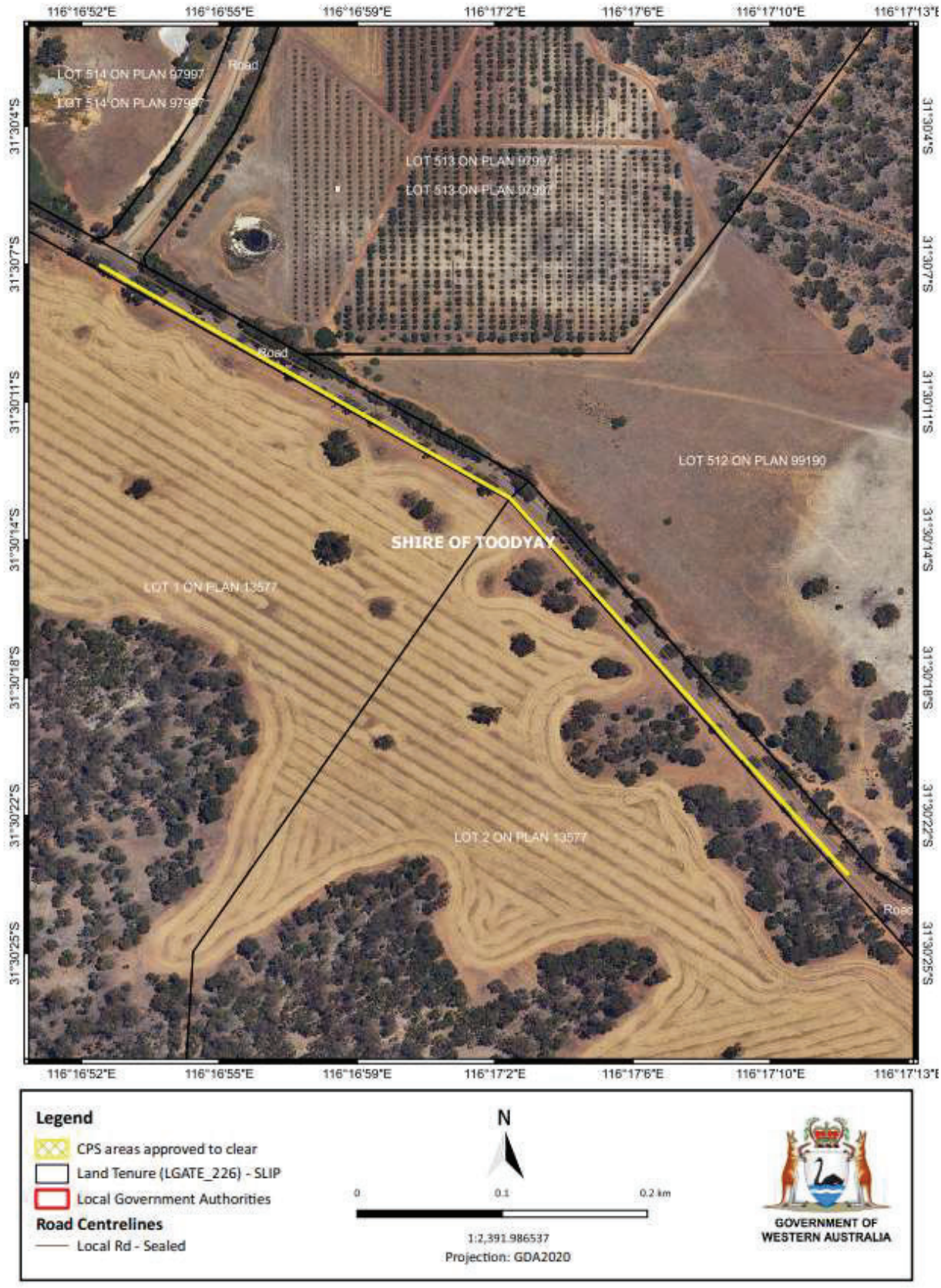


Figure 2(b): Map of the boundary of the area within which clearing may occur

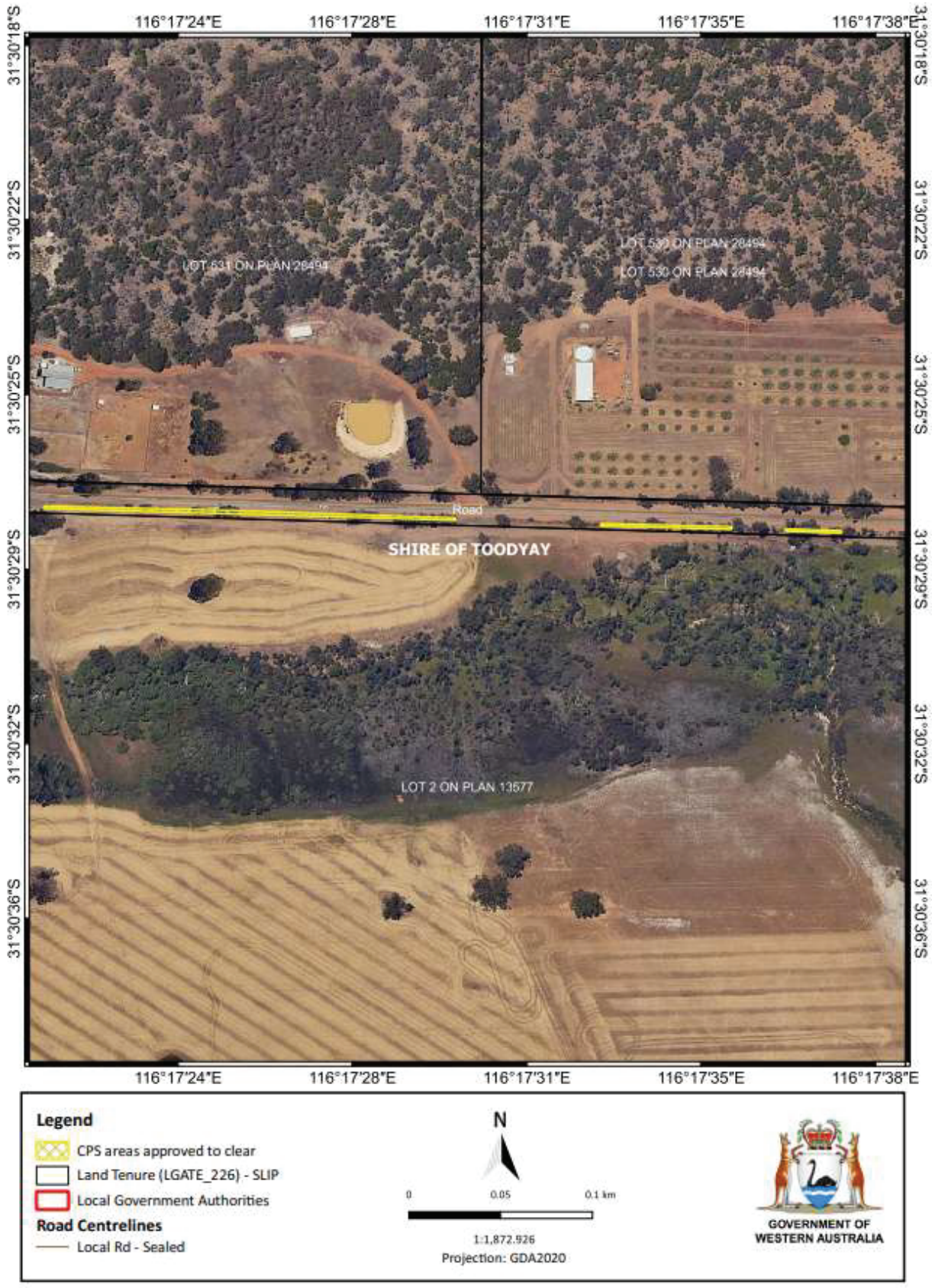


Figure 3(c): Map of the boundary of the area within which clearing may occur

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






birdlife AUSTRALIA

WATER CORPORATION

WESTERN AUSTRALIAN museum

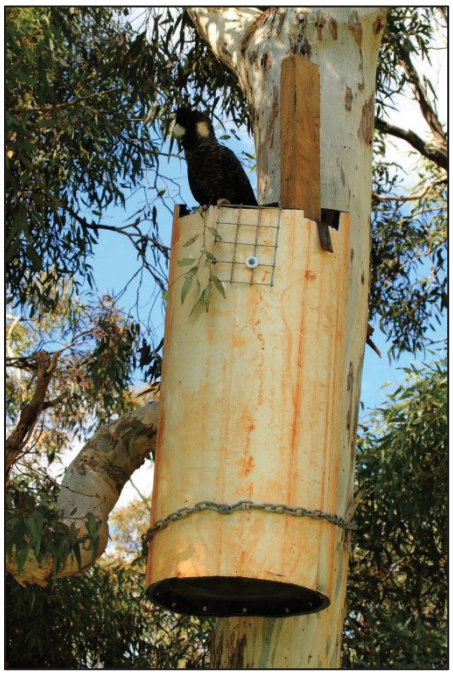
How to design and place artificial hollows for Carnaby's cockatoo

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. Zincalume ®), 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






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

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

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

Monitoring should be undertaken in order to detect:

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

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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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

Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

Monitoring aim	Frequency of visits	Monitoring techniques
To determine possible use by Carnaby's cockatoo	At least once during peak breeding season (i.e. between September and December)	• 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)	To observe at least two of the following: • Breeding behaviour of adults around hollow or evidence of chewing • Female flushed from hollow • Noises from nestlings in hollow Or to observe: • 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.	• Looking inside nest to observe eggs or nestlings.
To determine use by any species	As often as possible.	• 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.	• 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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Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9812/1
Permit type:	Area permit
Applicant name:	Shire of Toodyay
Application received:	14 July 2022
Application area:	0.21 hectares of native vegetation
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical
Property:	Julimar road reserve (PINs 11693088, 11727409 and 11727410)
Location (LGA area/s):	Toodyay
Localities (suburb/s):	Julimar

1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed along 2.2 kilometres, across either side of the Julimar road reserve for the purpose of improving road safety (see Figure 1, Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	16 March 2023
Decision area:	0.21 hectares of native vegetation, 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 (DWER) advertised the application for 21 days and one submission was received. The considerations of the submission is provided 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 survey (see Appendix F), 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 which is to improve driver safety of Julimar road.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable black cockatoo foraging habitat and potential breeding habitat;
- the loss of native vegetation that is significant as a remnant 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 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,
- undertake deliberate planting of at least 30 trees of local provenance species within the Julimar road reserve to mitigate the loss of 0.21 hectares of native vegetation that provides suitable habitat for black cockatoos within an extensively cleared landscape.

1.5. Site map

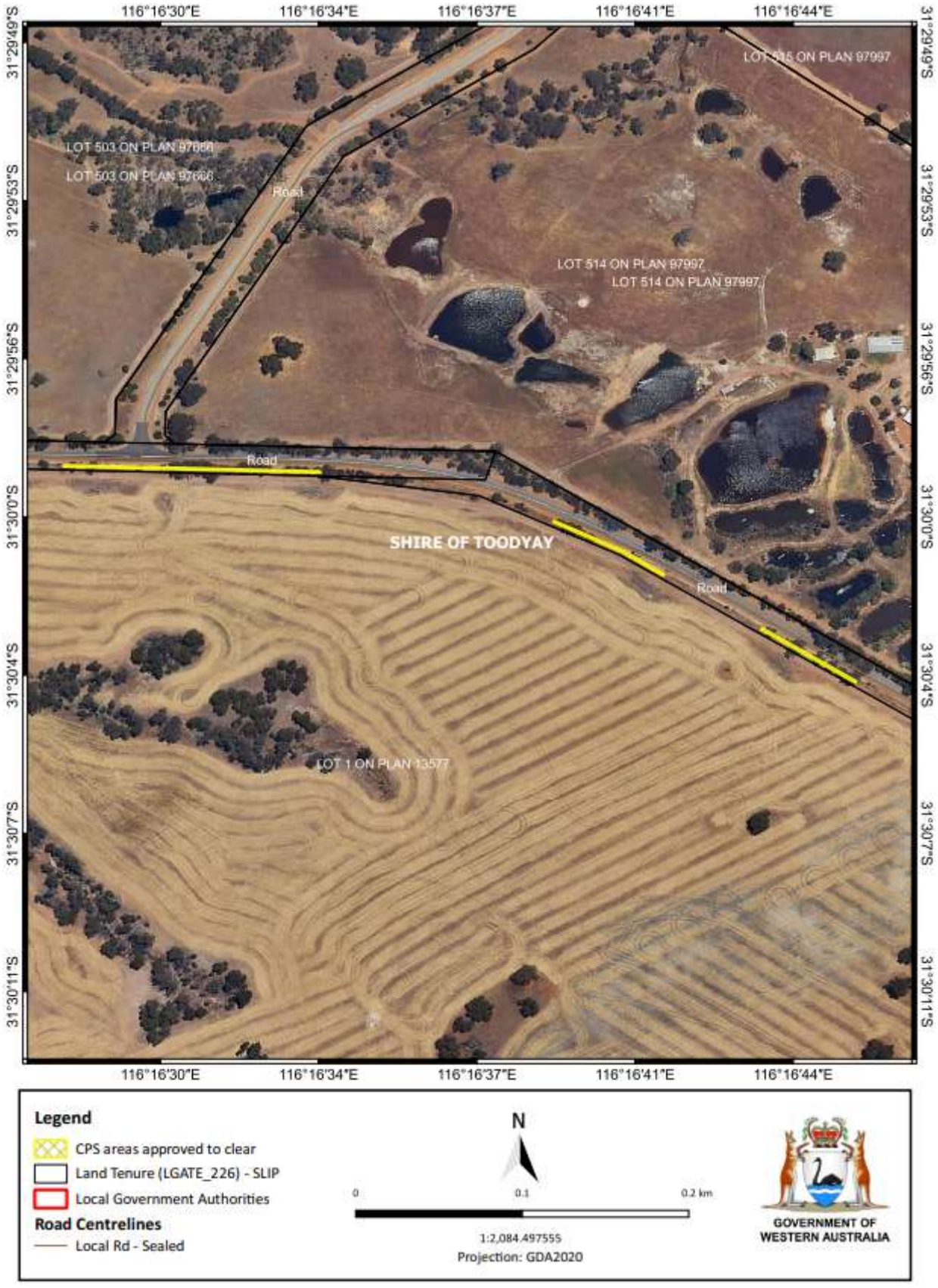

Figure 1(a) Map of the application area

The areas crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

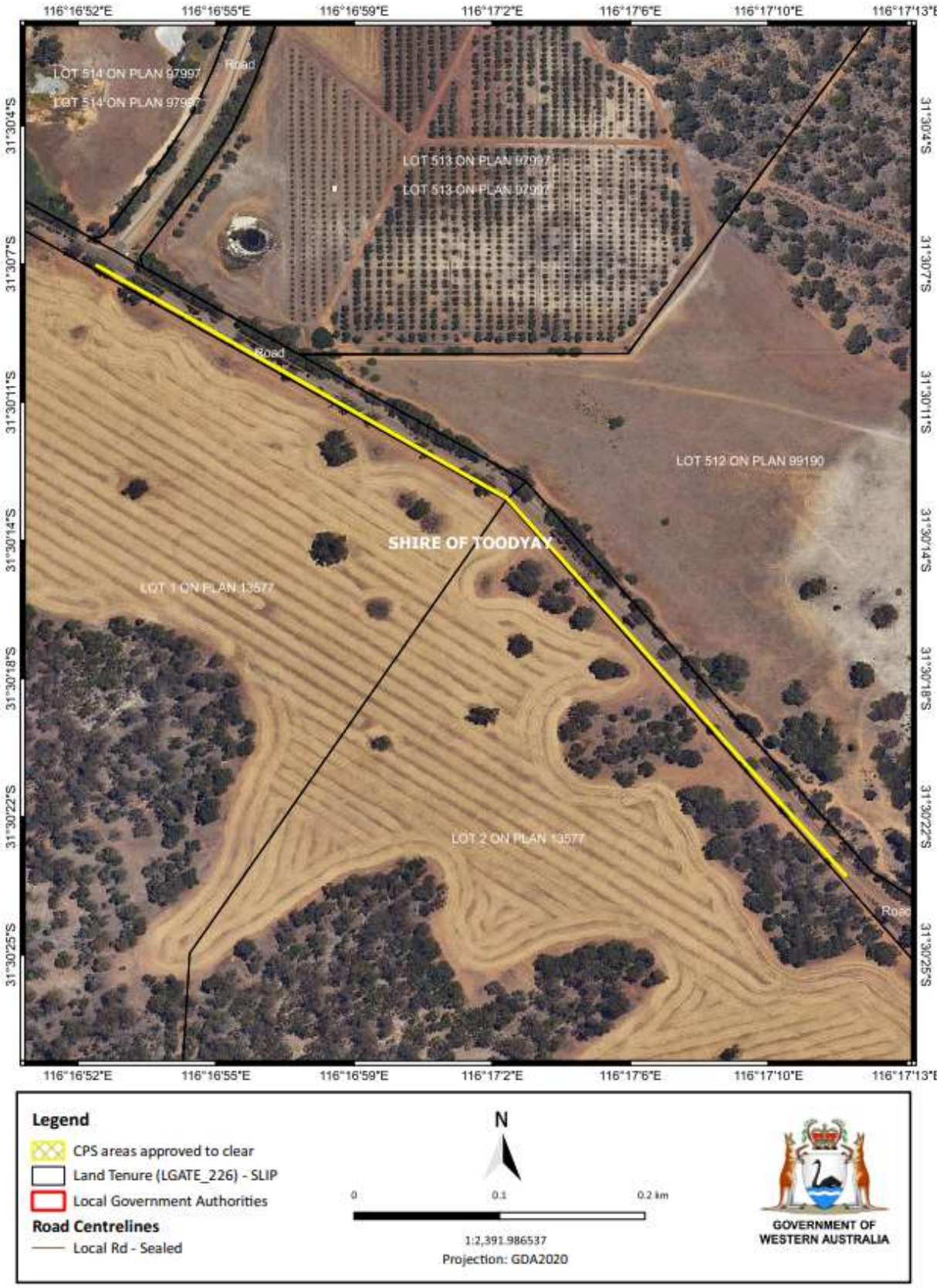

Figure 1(b) Map of the application area

The areas crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

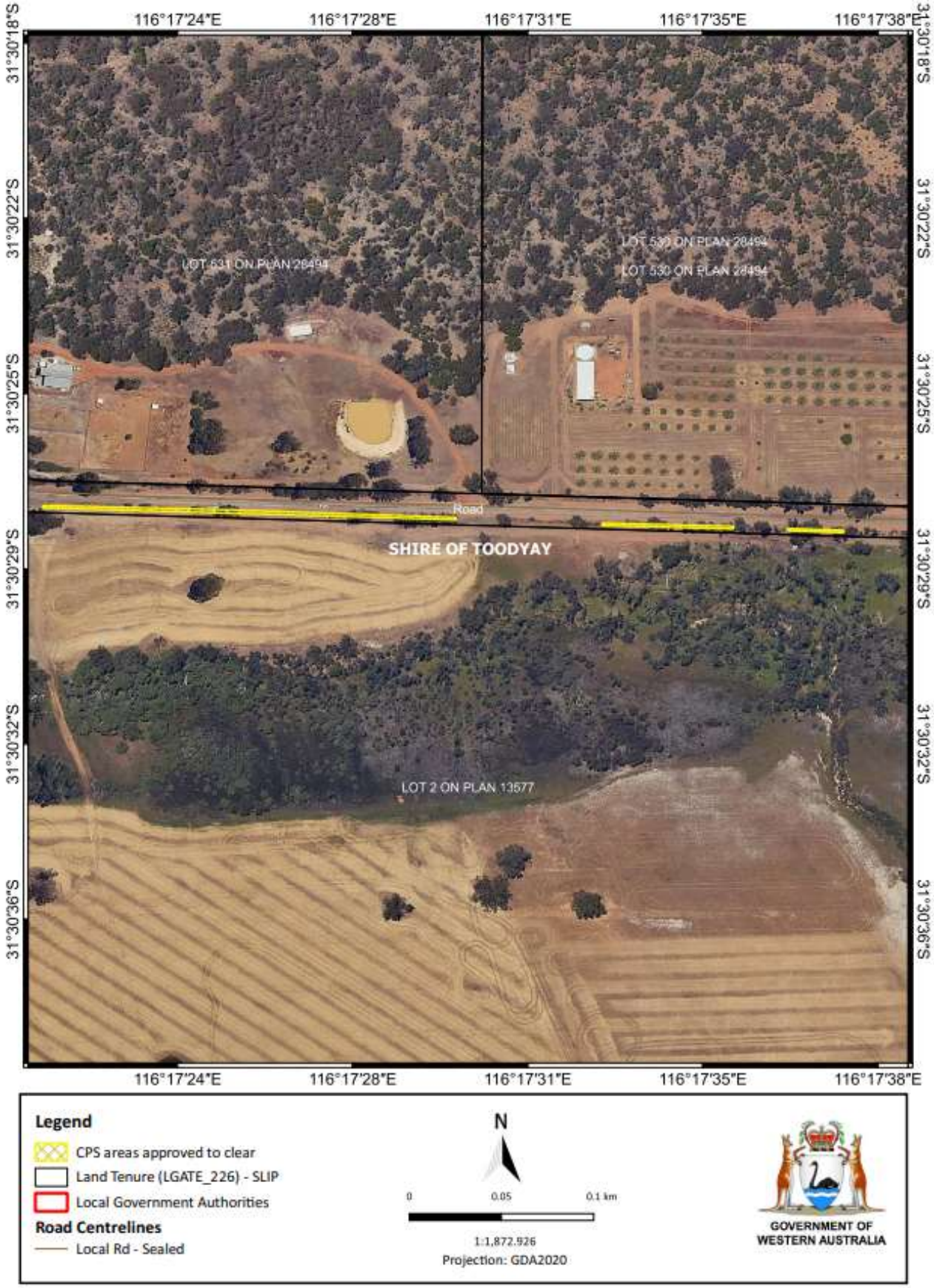

Figure 1(c) Map of the application area

The areas crosshatched yellow indicates the area 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)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

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 Shire of Toodyay (Shire), demonstrating that the Shire put significant efforts in the review of engineering design and scope of work to reduce the clearing footprint for the application. The Shire noted that:

- trees are located too close to drainage low points/culvert crossings and there isn't sufficient space to bypass open drains without the need of cutting roots and risking destabilising the trunks over time.
- our engineering team has taken great consideration during the review process in further limiting the amount of native vegetation clearing, however we are obliged to deliver safer roads to our community by applying best engineering practices.
- the proposed section of road was surveyed, and thorough consideration was given to horizontal and vertical design to avoid and mitigate native vegetation clearing. Only trees deemed necessary have been identified for removal.
- improvements to drainage, alignment and width of the curves and bends are required for road safety and efficiency.

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 0.21 hectares of vegetation, the Shire has committed to the planting of 30 native trees within the Julimar 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 Appendix C) 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 Appendix D) identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora) 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), (b) and (c)

Assessment

The vegetation within the proposed clearing area consists of degraded open woodland of marri (*Corymbia calophylla*), wandoo (*Eucalyptus wandoo*) and blue-leaved jarrah (*Eucalyptus marginata* subsp. *thalassica*) over native shrubs, herbs and introduced grasses (Shire of Toodyay, 2022b; Natural Area, 2022).

Fauna

According to available database records, 18 conservation significant fauna species occur with the local area (10 kilometres from the application area). These records consist of six bird, eight mammal, two reptile and two invertebrate species. The nearest record is a chuditch (*Dasyurus geoffroii*, VU) located 0.7 kilometres from the application area. The application area occurs within the mapped distribution of the threatened Carnaby's cockatoo (*Zanda latirostris*, EN) and forest red-tail black cockatoos (*Calyptorhynchus banksia naso*, VU). All three species of black cockatoos have been recorded within the local area with the closest record 1.1 kilometres from the application area. Available databases indicate Carnaby's cockatoos are locally common with approximately 100 records across the local area. Available database records show two records of Baudin's cockatoo, five records of forest red-tailed black cockatoo and six records of 'white-tailed black cockatoo' (either Carnaby's cockatoo or Baudin's cockatoo).

Black cockatoo habitat can be considered in terms of breeding habitat, night-roosting habitat, and foraging habitat (Commonwealth of Australia, 2022). Black cockatoos preferred foraging habitat includes jarrah and marri woodlands and forests, and proteaceous woodlands and heath dominated by plant species such as *Banksia* spp., *Hakea* spp. and *Grevillea* spp. (Commonwealth of Australia, 2022).

The black cockatoo habitat assessment conducted during September and November by Natural area (2022) recorded evidence of foraging by black cockatoos within the Julimar Road reserve in the form of chewed Marri nuts (Appendix F). The Black Cockatoo foraging quality scoring tool (DAWE, 2022) was applied to the survey areas to determine the quality of Black Cockatoo foraging habitat. This scoring tool assigns a habitat score between one and ten, with a score of ten representing the maximum possible score and very high-quality foraging habitat. Contextual adjustors (attributes that improve or reduce functionality of foraging habitat) such as tree species composition, distances from known breeding and roosting sites, distance from other foraging habitat, evidence of feeding debris, and presence of disease (e.g. *Phytophthora* spp.) were used to evaluate habitat quality. Using this scoring tool a score of 10 was assigned (Natural area, 2022), indicating the area contains high-quality native foraging habitat for Black Cockatoos. Given this, the vegetation proposed to be cleared are an important foraging resource for black cockatoos.

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 (DAWE, 2022), but may range up to 20 kilometres. Within the local area, one breeding site was recorded within the local area, 3.1 kilometres from the application area and one roost site is recorded 8.5 kilometres from the application area. An additional three known breeding sites are recorded within 20 kilometres of the application area.

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 (300 – 500 mm). The black cockatoo habitat assessment (Natural area, 2022) recorded habitat tree attributes in accordance with the Commonwealth guidelines and applied the Bamford tree scoring matrix (Bamford Consulting Ecologists, 2016) to score each individual habitat tree. This grading system classes trees according to their individual characteristics (evidence of use, type and size of hollow present). The survey identified a total of 44 trees with a DBH greater than 300 mm across the broader survey area of the Julimar road reserve. Within the application area, nine potential breeding trees were identified (DBH >300mm), with one of these containing a hollow (class three; 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)).

Noting the survey results (Natural area, 2022) and that the application area is within the foraging distance of known roosts and a breeding site, the 0.21 hectares over the application area is considered to provide important foraging resources and potential breeding habitat for black cockatoos within the local area. To reduce the risk of impact to black cockatoo individuals present at the time of clearing, pre-clearing inspection of tree with identified with the potential hollow for evidence of breeding use by black cockatoos will be required, including the installation of an artificial black cockatoo nest hollow if breeding is identified.

Given the lack of understory and the degraded nature of the vegetation within the application area, it is not *considered* likely to provide suitable habitat for ground dwelling fauna species, such as the chuditch (*Dasyurus geoffroii*, VU). However, it is considered to provide a dispersal function, linking fragments of remnant vegetation within the local

area. Slow, directional clearing will allow any terrestrial fauna present at the time of clearing to move into adjacent habitat ahead of the clearing.

To mitigate the loss of 0.21 hectares of native vegetation the comprises foraging habitat, the Shire has proposed to plant 30 trees within the Julimar Road reserve to maintain dispersal function within the area and ensure the clearing will not contribute to the decline of black cockatoo foraging habitat (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, 30 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).

Flora

According to available databases, 17 conservation significant flora records occur in local area, including two threatened and 15 priority flora records. The nearest record is the threatened *Thelymitra stellata* located 1.6 kilometres from the application area. There are records of four priority flora within two kilometres, two of which are found on the same soil type as the application area.

The likelihood of conservation significant flora occurring within the application area was determined by considering the number of records in the local area, habitat requirements, proximity of records to the application area, the type and condition of the vegetation within the application area and historical nature of the records. A summary of flora recorded within the local area is provided in Appendix C.

Of the 17 conservation significant flora species identified within the local area, five occur on the same soil type recorded within the application area (see section C.3). However, given the habitat requirements and the condition of the vegetation within the application area, these species are considered unlikely to occur within the application area. Given this, the application area is not considered to contain individuals or habitat for conservation significant flora.

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 30 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 the tree with the potentially suitable hollow for evidence of use by black cockatoos will be required.

The proposed clearing is unlikely to contain habitat for conservation significant flora. 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. Weed and dieback management practices will mitigate this risk.

Conditions

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

- avoidance and minimisation to reduce the impacts and extent of clearing
- 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 the tree with a potential hollow for evidence of breeding use by black cockatoos, including the installation of an artificial black cockatoo nest hollow if evidence of breeding is identified.
- undertake planting of 30 trees within the Julimar road reserve (PINs 11693088, 11727409 and 11727410)

3.2.2. Significant remnant vegetation - Clearing Principles (e)

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, Michibin and Yalanbe vegetation complexes that retain approximately 39, 26 and 47 per cent of their pre European extent, respectively. Photographs provided by the Shire (Shire of Toodyay, 2022b) and a black cockatoo habitat assessment (Natural area, 2022) identified the vegetation within the application area is largely representative of these vegetation complexes. The extent of vegetation remaining for the Michibin complex is inconsistent with the national objectives.

A review of available databases determined that the local area retains approximately 68.7 per cent of its pre-European native vegetation extent. 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.

Given the above, and the highly fragmented nature of the vegetation within the immediate area of the application, the proposed clearing area is considered significant as a remnant.

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 considered significant as a remnant.

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 0.21 hectares of native vegetation, the Shire has proposed to plant 30 trees within the Julimar 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 to reduce the impacts and extent of clearing
- weed and dieback management measures will be required as a condition on the clearing permit to mitigate impacts to adjacent vegetation.
- undertake planting of 30 trees within the Julimar road reserve (PIN: 11727409)

3.3. Relevant planning instruments and other matters

Several Aboriginal sites of significance have been mapped within the local area. None are recorded 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.

4 End

Appendix A. Additional information provided by applicant

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

Request for information	Further information provided
Further information on • avoidance and mitigation and, • the quality of black cockatoo habitat within the application area	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 **Error! Reference source not found.**)
Further information on avoidance and mitigation	The Shire provided an adequate response that included additional avoidance, minimisation and mitigation measures, including mitigation planting of 30 trees within the Julimar road reserve (Shire of Toodyay, 2023). This information has been considered in the avoidance and mitigation measures (see Section **Error! Reference source not found.**).

Appendix B. Details of public submissions

One public submission was received in relation to the proposed clearing (Submission, 2022).

Summary of comments	Consideration of comment
The proposed clearing area will impact on the threatened species Carnaby's black cockatoo and threatened flora species within the area.	The Shire commissioned a black cockatoo habitat assessment to inform impacts to black cockatoos (Natural Area, 2022). The potential for impacts to threatened fauna species including black cockatoo species were considered under the *Assessment of impacts on environmental values* (see Section 3.2). The department determined that there is a significant impact to foraging habitat for black cockatoos. To mitigate this impact, the Shire will be planting 30 trees within the Julimar road reserve (Shire of Toodyay, 2023). Where suitable hollows are identified during pre-clearance inspections, the Shire will be placing artificial hollows in an adjacent reserve. According to available databases, there are two threatened flora species within the local area, *Thelymitra stellata* and *Grevillea flexuosa* located. A likelihood assessment considered that these species are unlikely to occur within the application area due to the condition of the vegetation and lack of suitable habitat. This is addressed further under the *Assessment of impacts on environmental values* (see Section 3.2).

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	The area proposed to be cleared consists of scattered native vegetation along a 2.7 kilometre stretch of the left verge of Julimar road. The proposed clearing area is situated within a highly cleared landscape, surrounded by farmlands and patches of remnant vegetation. Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 68.7 per cent of the original native vegetation cover.

Characteristic	Details
Ecological linkage	The application area is not part of any formal ecological linkages. However, the road verge vegetation may provide informal linkages between patches of remnant vegetation.
Conservation areas	The application area does not occur within any conservation areas. The closest conservation area is Julimar State Forest located 1.5 kilometres north of the application area. Moondyne Nature Reserve occurs 6.3 kilometres south west and Avon Valley National Park occurs 6.9 kilometres south.
Vegetation description	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area consists of mixed open woodland of *Corymbia calophylla* and *Eucalyptus* spp. Representative photos are available in Appendix F. This is partially consistent with the three mapped vegetation types of the Darling Plateau Sub-region: • Coolakin – valleys, described as woodland of *Eucalyptus wandoo* with mixtures of *Eucalyptus patens, Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* on the valley slopes in arid and perarid zones • Michibin – valleys, described as open woodland of *Eucalyptus wandoo* over *Acacia acuminata* with some *Eucalyptus loxophleba* on valley slopes, with low woodland of *Allocasuarina huegeliana* on or near shallow granite outcrops in arid and perarid zones • Yalanbe - uplands, described as woodland of *Eucalyptus wandoo-Eucalyptus accedens*, less consistently open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on lateritic uplands and breakaway landscapes in arid and perarid zones The mapped vegetation types retain approximately 20, 4 and 21 per cent of the original extent respectively (Government of Western Australia, 2019).
Vegetation condition	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in degraded condition (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in 0. Representative photos are available in Appendix F.
Climate and landform	The landform of the area is characterised by undulating terrain with rock outcrops.
Soil description	The application area covers four mapped soil subsystems: • Michibin Subsystem, described as gentle to moderate hill slopes of freshly weathered soils. Red and yellowish-brown loams and clays, often gravelly with rocky areas and lateritic crests. • Yalanbee Subsystem, described as residual plateau at the top of the landscape shallowly dissected by Pindalup valleys. Pisolitic gravelly, yellowish brown soils that vary in texture from loamy sands to clays, with pockets of pale sands and areas of outcropping laterite. • Leaver Subsystem, described as 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. • Wundowie Kokeby Subsystem, described as very gentle sloping areas located in small pockets on summits and at breaks of slope. White and deeply bleached sand over laterite at greater than a metre depth.
Land degradation risk	The application area has a medium to high risk of land degradation due to wind erosion, a medium risk of phosphorus export and a high risk of substrate acidification.
Waterbodies	Desktop assessment and aerial imagery indicated that the application area does not intercept any waterbodies. Several manmade public waterbodies are located approximately 25 metres north of the application.

Characteristic	Details
Hydrogeography	The application area occurs within the Swan Avon catchment area of the Avon River basin.
Flora	Seventeen flora records in local area, including two threatened and 15 Priority records. The nearest record is the threatened *Thelymitra stellata* located 1.6 kilometres from the application area. There are records of four conservation significant flora within four kilometres, two of which are found on the same soil type as the application area.
Ecological communities	No Threatened or Priority ecological communities (TEC/PEC) are mapped within the application area or within the local area. Several patches of remnant vegetation identified as the Eucalyptus Woodlands of Western Australia Wheatbelt (Eucalyptus Woodlands) are mapped 11 kilometres south east of the application area. The Eucalyptus Woodlands are listed as Priority 3 PEC in Western Australia which is synonymous with the Commonwealth listed TEC.
Fauna	Database records list 18 conservation significant fauna species occuring with the local area. The nearest record is a chuditch (*Dasyurus geoffroii*, VU) siting 0.7 kilometres from the application area. The application area occurs within the mapped distribution of Carnaby and forest red-tail cockatoos. All three species of black cockatoos have been recorded within the local area with the closest 1.1 kilometres from the application area. There are two known black cockatoo breeding and roost sites within the local area. A black cockatoo assessment identified potential breeding habitat and evidence of foraging 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	69.74
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
Yalanbe 312	197,849.01	92,080.88	46.54	41,703.16	21.08
Local area					
10km radius	35,639.57	24,477.22	68.68	-	-

*Government of Western Australia (2019a)

C.3. Flora analysis table

Species name	Conservation status	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]
Thelymitra stellata	T	Y	Y	1.55	29	NA
Stylidium vinosum	P1	Y	Y	1.91	3	NA
Hibbertia miniata	P4	Y	N	1.96	2	NA
Persoonia sulcata	P4	Y	N	3.92	7	NA
Verticordia citrella	P2	Y	Y	5.07	1	NA
Grevillea candolleana	P2	Y	Y	7.94	11	NA

Species name	Conservation status	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]
Grevillea flexuosa	T	Y	Y	8.85	40	NA

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

C.4. Fauna analysis table

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]
Dasyurus geoffroii (chuditch)	VU	N	Y	0.73	5	NA
Zanda latirostris previously *Calyptorhynchus latirostris* (Carnaby's cockatoo)	EN	Y	Y	1.12	100	NA
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	Y	1.88	5	NA
Notamacropus Irma (western brush wallaby)	P4	N	N	2.81	16	NA
Zanda baudinii previously *Calyptorhynchus baudinii* (Baudin's cockatoo)	EN	Y	Y	3.15	2	NA

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		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared is not considered likely to contain any conservation significant flora or unique assemblages of plants. However, the application area does contain foraging and potential breeding habitat for black cockatoos.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains foraging and potential breeding habitat for conservation significant fauna species, including black cockatoos. The application area also functions as a linkage for fauna to move through the landscape.	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: According to available databases, there is one record of threatened flora within the local area, *Thelymitra stellata* located 1.6 kilometres from the	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
application area. A likelihood assessment considered that this species is unlikely to occur within the application area due to the condition of the vegetation and lack of suitable habitat (disturbed understorey). The area proposed to be cleared is therefore unlikely to contain individuals of or habitat necessary for the continued existence of, threatened flora.		
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."* Assessment: No mapped Priority or Threatened Ecological Communities occur within the local area. The area proposed to be cleared does not intersect any mapped Priority or Threatened Ecological Communities. Due to the species and degraded condition of the understory, the vegetation within the application area is not considered to represent a Threatened Ecological Community.	Not at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. Of the mapped vegetation types within the application area, two have an extent over 30 per cent and are consistent with the national objectives, however, one vegetation association, the Michibin vegetation complex retains less than 30 per cent.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
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."* Assessment: Given the distance to the nearest conservation area is 1.5 kilometres from the application area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality. The proposed clearing areas do not support native vegetation growing in, or in association with, an environment associated with a watercourse or wetland.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are moderately susceptible to wind erosion and Eutrophication (phosphorus export), and highly susceptible to substrate acidification. Eutrophication (Phosphorus export) is not likely to be a risk in	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
consideration of the final land use as a public road. Cleared areas will be replaced with a hard road surface negating any potential for wind erosion. Soils will not be excavated at depth, and groundwater will not be intersected, reducing the risk of exposing any acid sulphate soils. Given this, the proposed clearing is not likely to have an appreciable impact on land degradation.		
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: No water courses, wetlands or Public Drinking Water Sources Areas are recorded within the application area. Soils will not be excavated at depth and risks to groundwater are low. The proposed clearing therefore is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: 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. The mapped risk for flooding potential over the three application areas is rated at low. Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging.	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.
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.

Condition	Description
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 photographs of the vegetation (Shire of Toodyay, 2022b)

Figure 2. Photographs of application area (Shire of Toodyay, 2022b)

Figure 3. Photographs of application area (Shire of Toodyay, 2022b)

Figure 4. Foraging evidence observed within Julimar road reserve (Natural Area, 2022)

Figure 5. Potentially suitable hollow within Julimar road reserve (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)

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