



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8392/2
Permit Holder:	Mr Graeme Robertson
Duration of Permit:	17 July 2020 to 17 July 2031

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of extractive industry and road upgrades.

2. Land on which clearing is to be done

Lot 9005 on Deposited Plan 52008, Nullaki
Lee Road reserve (PINS 11640931, 11640930, 11640926, 11640925) Youngs Siding
Browns Road reserve (PINS 1164027, 11640795, 11640794) Youngs Siding
Lake Saide Road reserve (PINS 11640793, 11640792, 11640788), Youngs Siding

3. Area of Clearing

The Permit Holder must not clear more than 15.19 hectares of native vegetation within the area shaded yellow on attached Plan 8392/2a, Plan 8392/2b, Plan 8392/2c and Plan 8392/2d

4. Duration of clearing

- (a) This Permit does not authorise the Permit Holder to clear native vegetation after 17 July 2025.
- (b) This Permit does not authorise the Permit Holder to clear native vegetation within the area crossed hatched green on attached Plan 8392/2e (pit area) for the purpose of extractive industry after 31 December 2021.

5. Limitation of clearing within the lime pit

- (a) The Permit Holder must not clear more than two hectares at any given time within the area crossed hatched green on attached Plan 8392/2e for the purpose of extractive industry.
- (b) The Permit Holder must not clear more than eight hectares total within the area crossed hatched green on attached Plan 8392/2e.

6. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

PART II – MANAGEMENT CONDITIONS

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

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

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

8. Direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other (e.g. east to west) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

9. Weed and Dieback control

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

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

10. Fauna management – western ringtail possum

- (a) In relation to the areas cross-hatched red on attached Plan 8392/2f, Plan 8392/2g and Plan 8392/2h, the Permit Holder must engage a *fauna specialist* to inspect that area, including all trees and tree hollows present, within 24 hours prior to, and for the duration of clearing, for the presence of (*Pseudocheirus occidentalis*) western ringtail possum(s).
- (b) In relation to the areas cross-hatched red on attached Plan 8392/2f, Plan 8392/2g and Plan 8392/2h, the Permit Holder must not clear dreys identified within these areas.
- (c) Clearing must cease in any area where fauna referred to in condition 10(a) above are identified until either:
 - i. the western ringtail possum(s) individual has moved on from that area to adjoining *suitable habitat*; or
 - ii. the western ringtail possum(s) individual has been removed by a *western ringtail possum specialist*.
- (d) Any western ringtail possum (*Pseudocheirus occidentalis*) individuals removed in accordance with condition 10(c)(ii) of this Permit must be relocated by a *western ringtail possum specialist* to *suitable habitat*.
- (e) Where fauna is identified under condition 10(a) of this Permit, the Permit Holder must provide the following records to the *CEO* as soon as practicable:
 - i. the number of individuals identified;
 - ii. the date each individual was identified;
 - iii. the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - iv. the number of individuals removed and relocated;
 - v. the relevant qualifications of the *western ringtail possum specialist* undertaking removal and relocation;
 - vi. the date each individual was removed;
 - vii. the method of removal;
 - viii. the date each individual was relocated;
 - ix. the location where each individual was relocated to, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees; and
 - x. details pertaining to the circumstances of any death of, or injury sustained by, an individual.

11. Fauna management – black cockatoos breeding trees

- (a) within 24 hours prior to, and for the duration of clearing authorised under this Permit:
 - i. the area cross-hatched red on attached Plan 8392/2f, Plan 8392/2g and Plan 8392/2h shall be inspected by a *fauna specialist* who shall identify *black cockatoo breeding trees*; and
 - ii. each *black cockatoo breeding tree* identified shall be inspected by a *fauna specialist* for evidence of current or past breeding use by *black cockatoos*.
- (b) Where a *black cockatoo breeding tree(s)* with evidence of current breeding use by *black cockatoos* is identified and cannot be avoided, that tree(s) shall be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.

- (c) Any black cockatoo breeding tree(s) with evidence of current breeding use by black cockatoos shall not be cleared while it is in use as determined by the fauna specialist under condition 11(b) of this Permit.
- (d) Where a black cockatoo breeding tree(s) with evidence of past breeding use by black cockatoos is identified and cannot be avoided, that tree(s) shall only be cleared:
 - i later the same day of the inspection required under condition 11(a)(ii) of this Permit if that inspection does not identify evidence of current breeding use; or
 - ii later the same day of a repeat inspection undertaken by a *fauna specialist* if that inspection does not identify evidence of current breeding use.
- (e) For each black cockatoo breeding tree with evidence of current or past breeding use by black cockatoos that cannot be avoided, the Permit Holder shall install an artificial black cockatoo nest hollow.
- (f) Each artificial black cockatoo nest hollow required by condition 11(e) of this Permit must be installed prior to the commencement of the next black cockatoo breeding season following clearing of the related black cockatoo breeding tree.
- (g) The artificial black cockatoo nest hollow(s) required by condition 11(e) of this Permit must:
 - i be installed within the area cross-hatched red on attached Plan 8392/2f, Plan 8392/2g and Plan 8392/2h;
 - ii be designed and placed in accordance with the guidelines provided in Schedule 1 of this Permit; and
 - iii be monitored and maintained in accordance with the guidelines provided in Schedule 2 of this Permit, for a period of a minimum ten years.

12. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) Retain the vegetative material and topsoil removed by clearing authorised within the area crossed hatched green on attached Plan 8392/2e and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) At an *optimal time* within 12 months following completion of material extraction, *revegetate* and *rehabilitate* the areas not required for the purpose of which they were cleared under this permit, by:
 - (i) ripping the ground on the contour to remove soil compaction; and
 - (ii) laying the vegetative material and topsoil retained under condition 12(a) on the cleared area(s).
- (c) Within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 12(b) of this Permit:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 12(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) Where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 12(c)(ii) of this permit, the Permit Holder shall repeat condition 12(c)(i) and 12(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) Where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 12(c)(i) and (ii) of this permit, that determination shall be submitted for the *CEO's* consideration. If the *CEO* does not agree with the determination made under condition 12(c)(ii), the *CEO* may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 12(c)(ii).

PART III – RECORD KEEPING AND REPORTING

13. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit, in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date that the area was cleared;
- (c) the direction of clearing;
- (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 7 of this Permit.
- (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 9 of this Permit;
- (g) fauna management measures in accordance with condition 10 and 11 of this Permit; and
- (h) in relation to the revegetation and rehabilitation of areas pursuant to condition 12 of this Permit
 - (i) the size of the area revegetated and rehabilitated;
 - (ii) the date(s) on which the area revegetation and rehabilitation was undertaken;
 - (iii) the revegetation and rehabilitation activities undertaken;
 - (iv) the date(s) where additional planting or direct seeding of native vegetation is undertaken and
 - (v) the boundaries of the area revegetated and rehabilitated (recorded digitally as a shapefile).

14. Records must be kept

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
 - (i) of records required under condition 13 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 17 April 2031 the Permit Holder must provide to the *CEO* a written report of records required under condition 13 of this Permit where these records have not already been provided under condition 14(a) of this Permit.

DEFINITIONS

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

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

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

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

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

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

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.

fauna specialist means a person who holds a tertiary qualification specializing in environmental science or equivalent, has a minimum of two years field experience in fauna identification and surveys of fauna native to

the region being inspected or surveyed and holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*;

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

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

optimal time means the period from July to September;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

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

revegetate/ed/ion means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration*, *direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.

suitable habitat means habitat known to support western ringtail possums (*Pseudocheirus occidentalis*) within the known current distribution of the species, typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy cover and continuity. Known habitat includes peppermint (*Agonis flexuosa*) dominated woodlands, jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) forests, riparian vegetation with a canopy of Bullich (*Eucalyptus megacarpa*) or flooded gum (*Eucalyptus rudis*), karri (*Eucalyptus diversicolor*) forests, sheoak (*Allocasuarina fraseriana*) dominated woodlands, and other stands of myrtaceous trees growing near swamps, watercourses or floodplains;

weed/s means any plant -

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

western ringtail possum specialist means a *fauna specialist* who has a minimum of two years field experience in western ringtail possum (*Pseudocheirus occidentalis*) identification, surveys of western ringtail possums and capture and handling of western ringtail possums and holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

29 October 2020

SCHEDULE 1

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

Artificial hollows for Carnaby's cockatoo



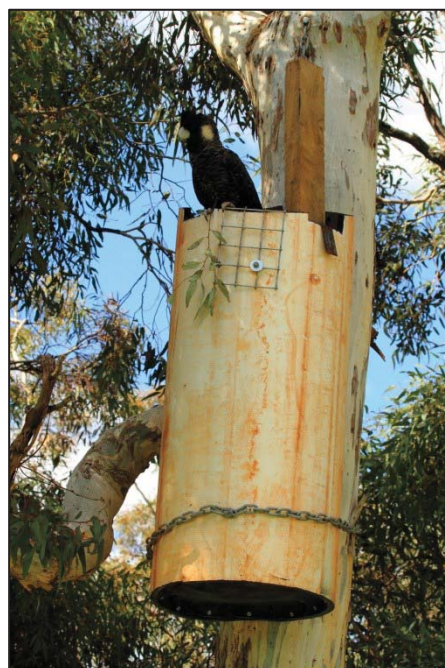
How to design and place artificial hollows for Carnaby's cockatoo

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

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

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

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



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

Walls

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

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

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

Base

The base of the artificial hollow must be;

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

Do not use:

- Saw dust or fibre products that will retain moisture.

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



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

Entrance

The entrance of the artificial hollow must;

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

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

Ladder

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

The ladder must be;

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

Do not use:

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

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

Sacrificial chewing posts

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

The sacrificial chewing posts must:

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

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



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

Photo by Rick Dawson

Mountings

The artificial hollows must be mounted such that:

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

Placement

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

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

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

Artificial hollows to be placed in trees require:

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

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

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

Safety

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

Maintenance and monitoring

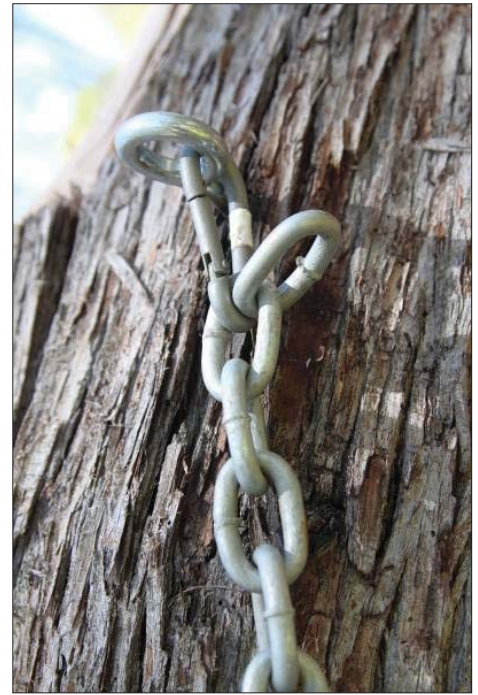
Once artificial hollows have been placed they require monitoring and maintenance to ensure they continue to be useful for nesting by Carnaby's cockatoo. It is important to monitor artificial hollows to determine use by Carnaby's cockatoo, other native species as well as pest species. By undertaking monitoring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

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

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



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



Example fixing for artificial hollow
Photo by Christine Groom

Acknowledgements

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

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

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

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

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

SCHEDULE 2

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



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

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

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

Monitoring should be undertaken in order to detect:

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



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

How do I monitor artificial hollows?

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

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

Looking for signs of use

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

Observing parent behaviour around the hollow

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

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

Observing feeding flocks

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

Tapping

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

Observing insect activity around nest

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

Listening for nestlings

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

Looking inside the nest

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

How often should I monitor artificial hollows?

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

How do I maintain artificial hollows?

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

Maintenance checks should assess the following as a minimum:

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



Artificial hollow base needing repair.
Photo by Christine Groom

Repairing hollows

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

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

Monitoring of artificial hollows:

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

Acknowledgements

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

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>

Plan 8392/2 a

117°26'24.000"E

117°26'42.000"E

117°27'0.000"E

117°27'18.000"E

35°2'24.000"S

35°2'42.000"S

35°3'0.000"S

35°3'18.000"S

35°2'24.000"S

35°2'42.000"S

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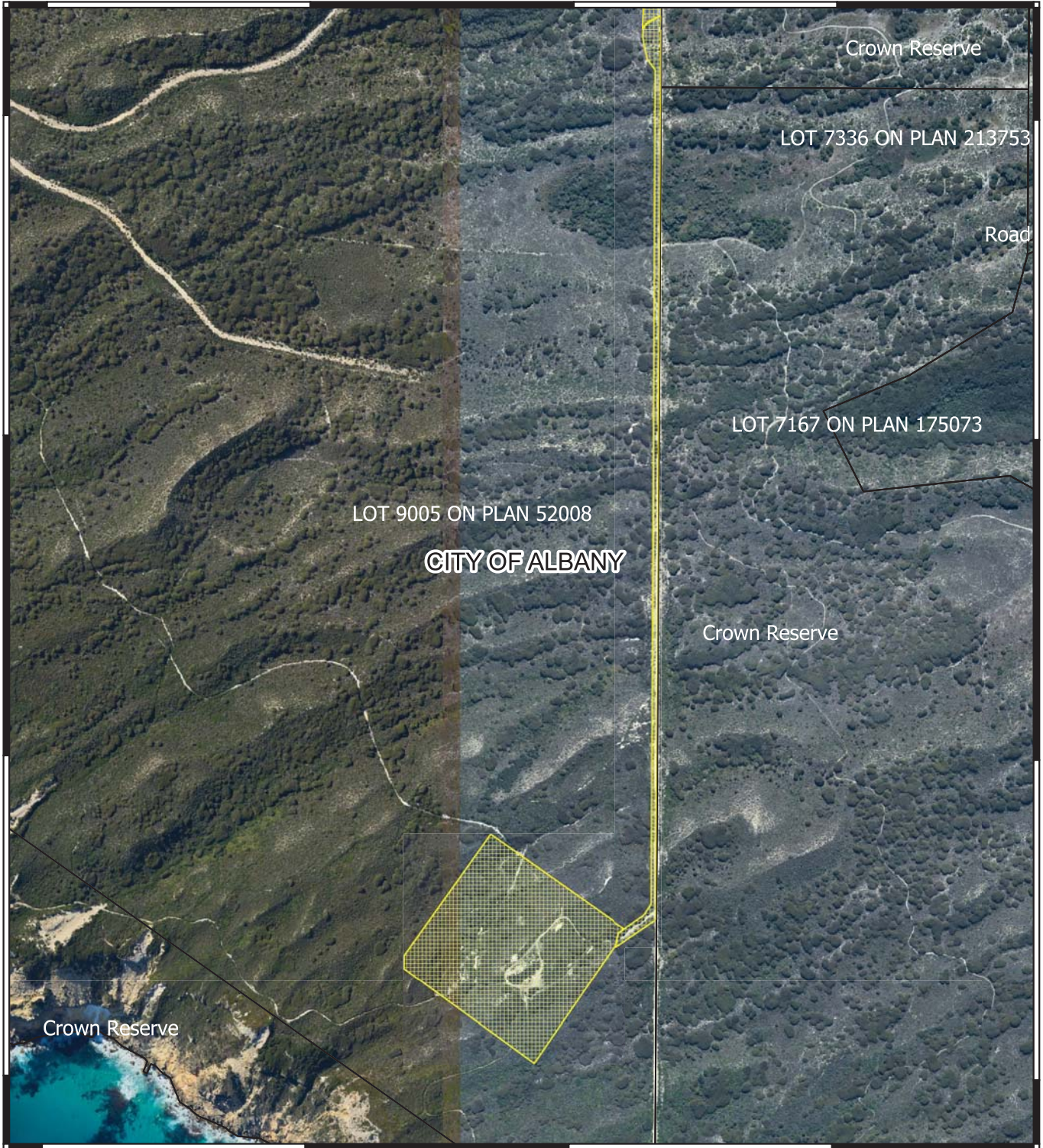
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


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Legend

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-  Land TenureLGATE - 226
-  Local Government Authorities

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GOVERNMENT OF
WESTERN AUSTRALIA

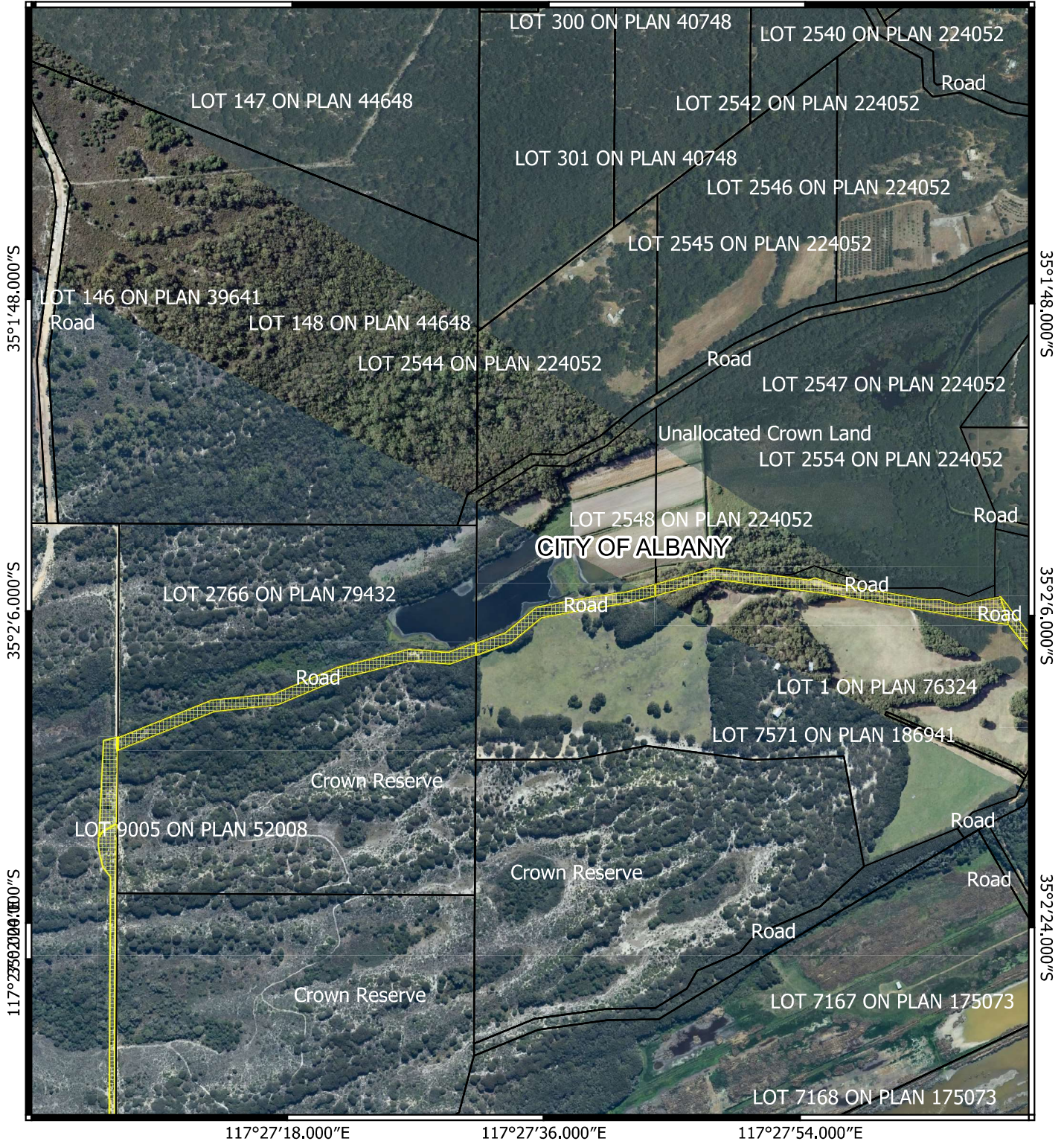
Plan 8392/2 b

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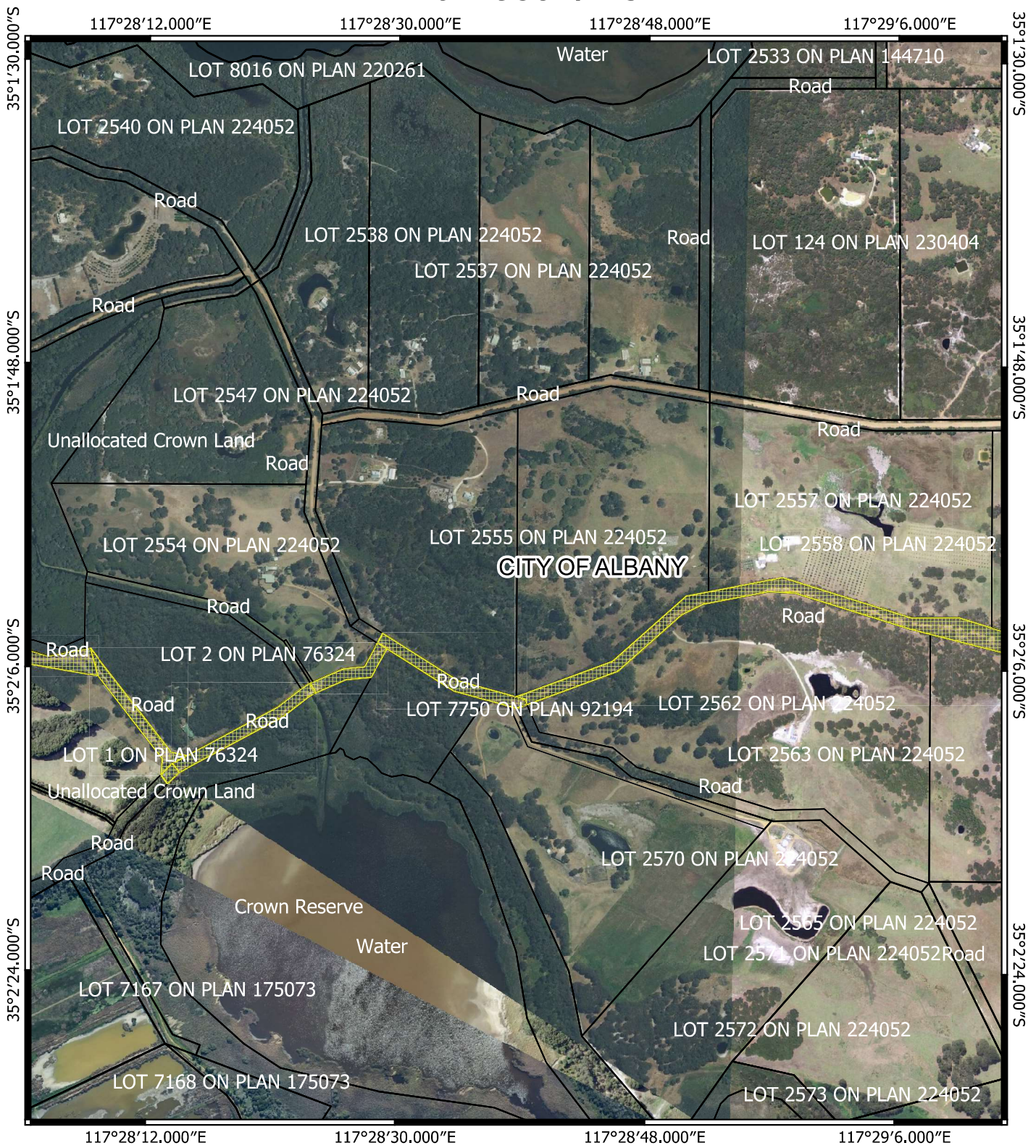
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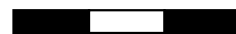
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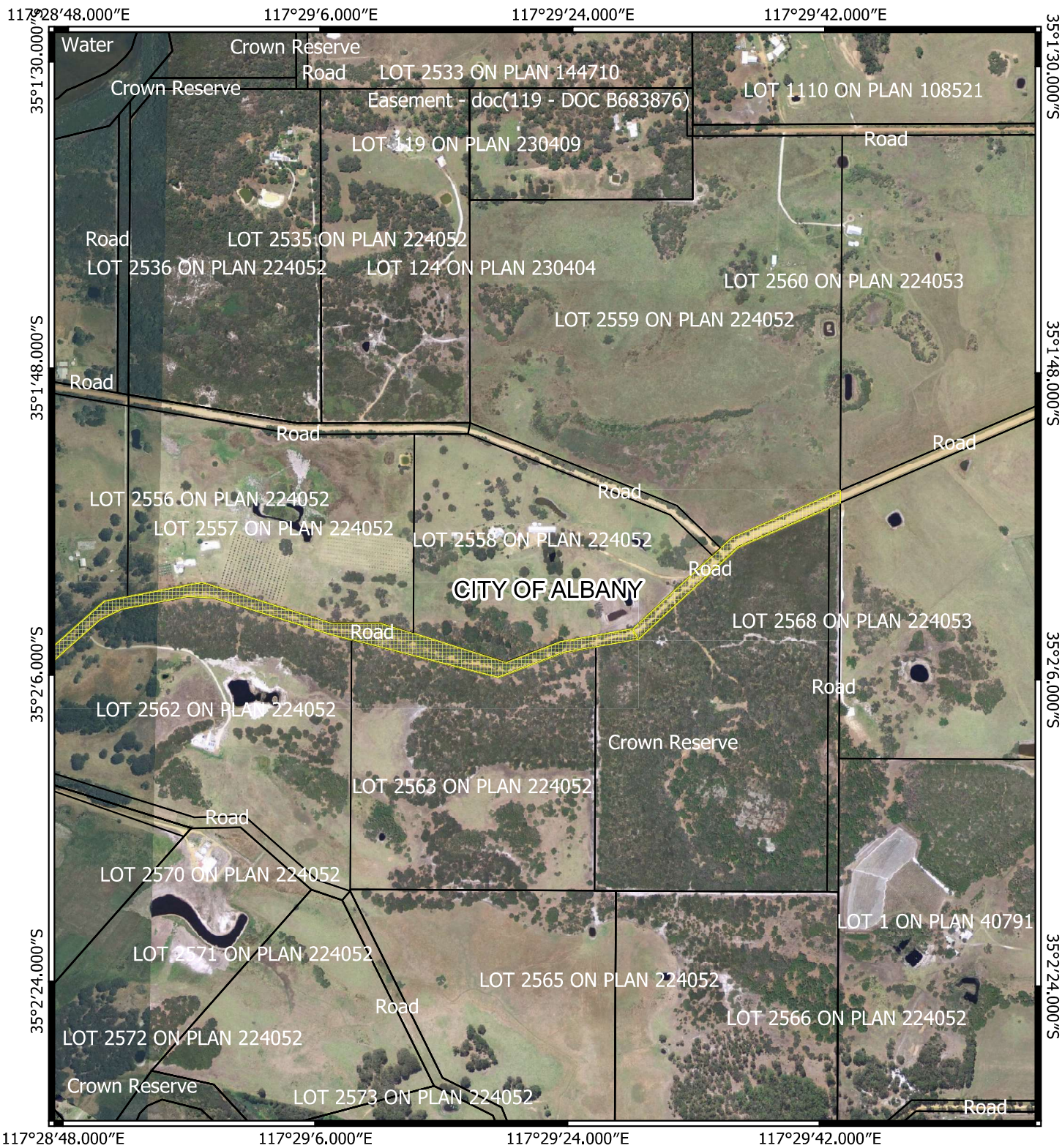
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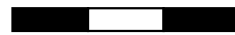
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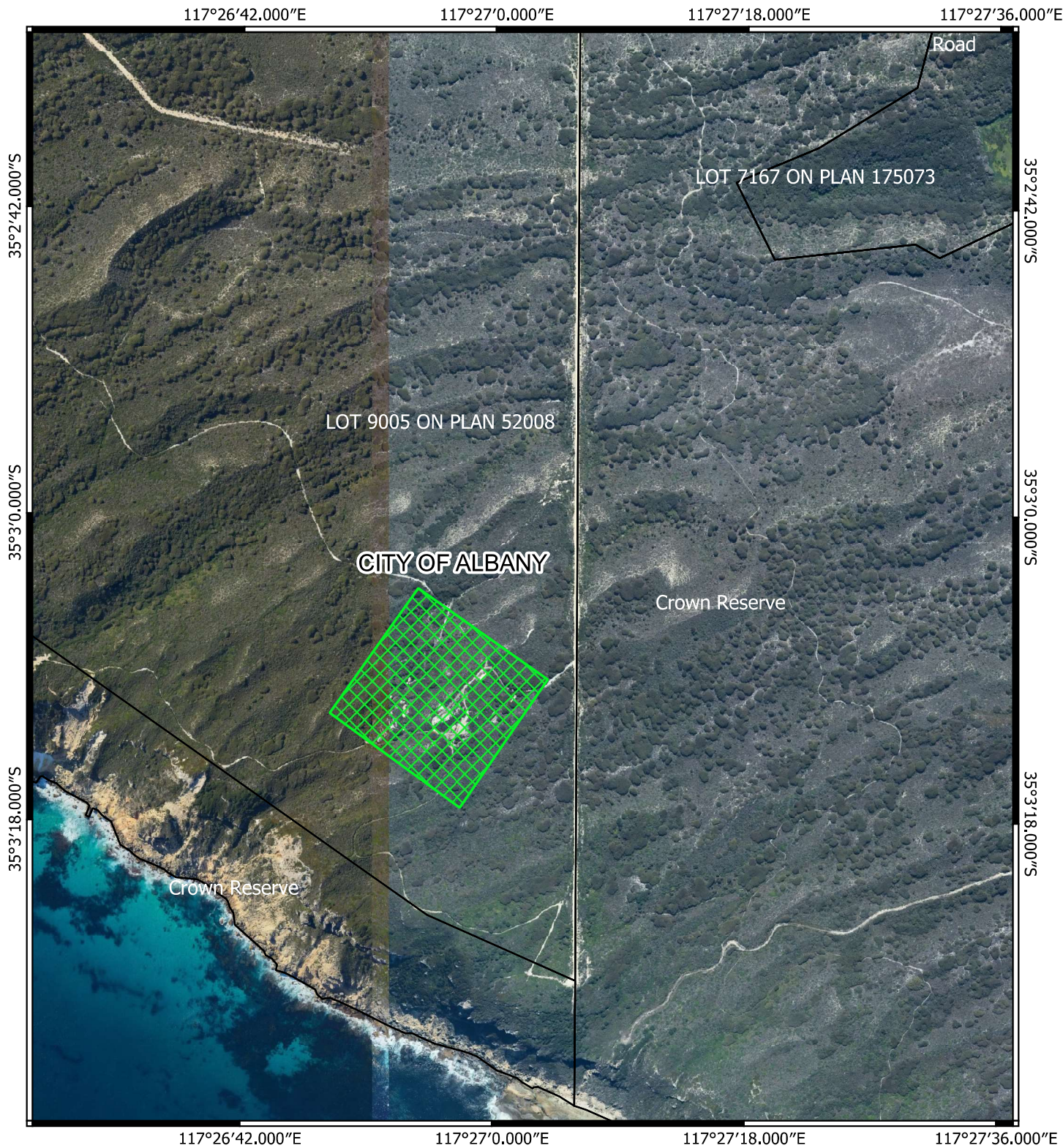
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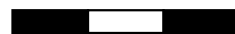
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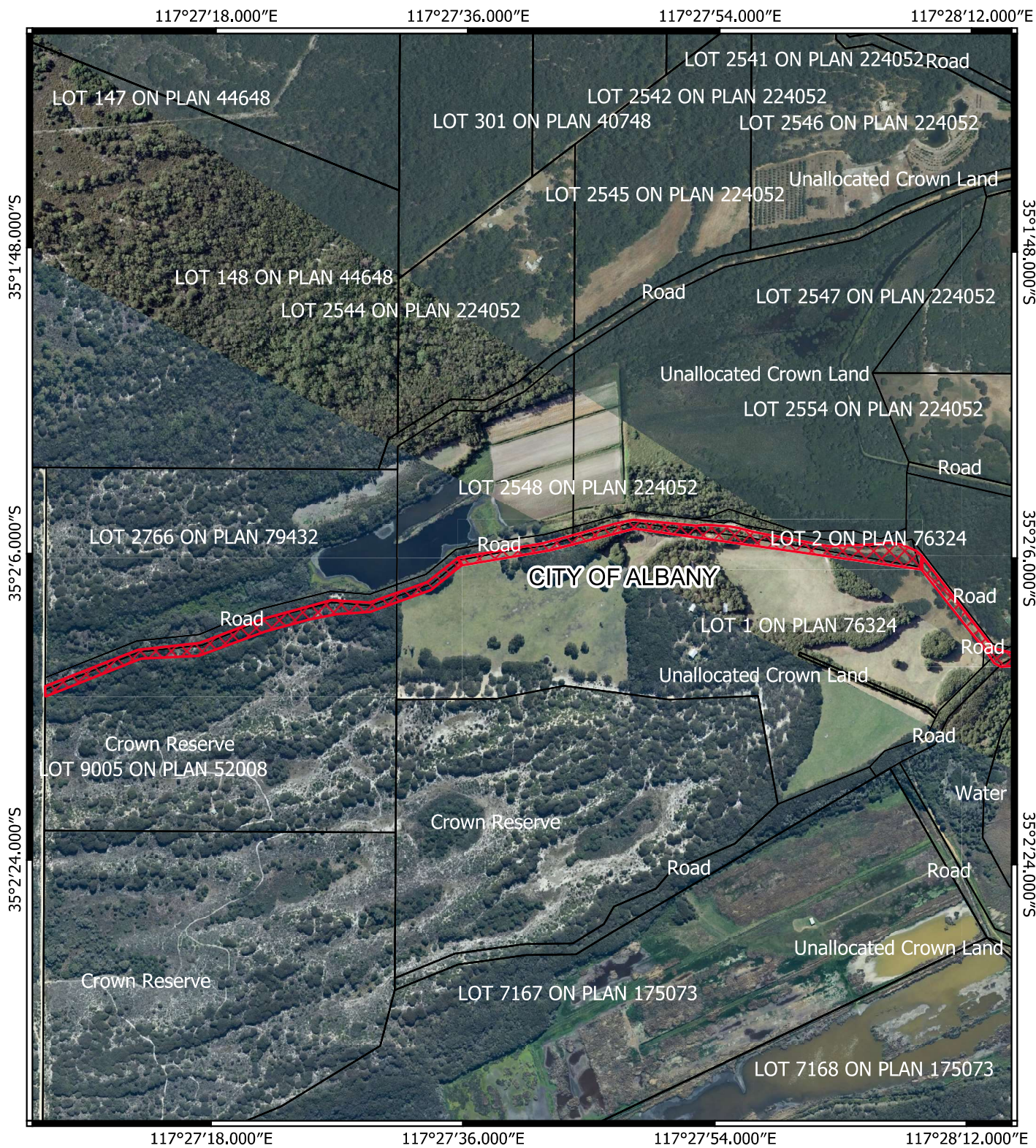
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GOVERNMENT OF
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-  Land TenureL GATE - 226
-  Local Government Authorities

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-  Local Government Authorities

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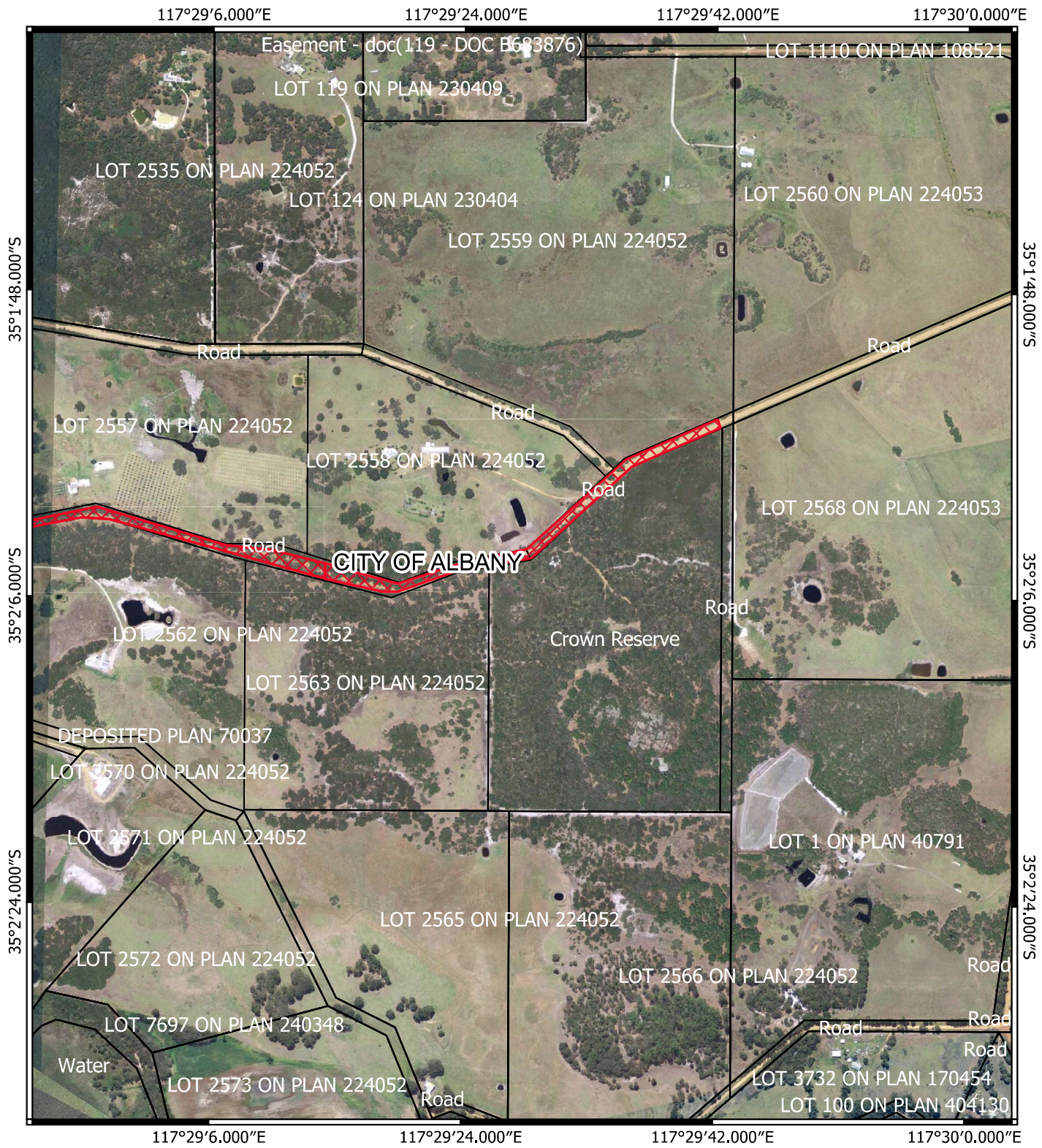
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-  Local Government Authorities

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GOVERNMENT OF
WESTERN AUSTRALIA



1. Application details

1.1. Permit application details

Permit application No.: 8392/2
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Mr Graeme Robertson
Application received date: 25 February 2019

1.3. Property details

Property: Lot 9005 on Deposited Plan 52008, Nullaki
Lee Road Reserve (PINS 11640931, 11640930, 11640926 and 11640925), Youngs Siding
Browns Road Reserve (PINS 1164027, 11640795, 11640794), Youngs Siding
Lake Saide Reserve (PINS 11640793, 11640792 and 11640788), Youngs Siding
Local Government Authority: Albany, City of
Localities: Nullaki, Youngs Siding

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
15.19		Mechanical Removal	Extractive industry Road construction and upgrades

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 29 October 2020

Reasons for Decision: On 24 June 2020, Clearing Permit CPS 8392/1 was granted to clear up to 15.19 hectares of native vegetation within Lot 9005 on Deposited Plan 52008, Nullaki, Lee Road Reserve (PINS 11640931, 11640930, 11640926 and 11640925), Youngs Siding, Browns Road Reserve (PINS 1164027, 11640795, 11640794), Youngs Siding and Lake Saide Reserve (PINS 11640793, 11640792 and 11640788), Youngs Siding. Thirteen appeals were lodged against the grant of this permit.

This clearing permit amendment gives effect to the determination of the Minister for Environment (Minister) to allow in-part the appeal (Appeal Number 031 of 2020). The Minister has requested the Department of Water and Environmental Regulation to:

- Require the permit holder to conduct pre-clearing inspections of trees with hollows for use by black cockatoos;
- Require the permit holder to avoid clearing any hollows in use by black cockatoos until chicks have fledged;
- Require the permit holder to replace (cleared) hollows used by black cockatoos with artificial hollows that are installed in an appropriate location nearby and prior to the next breeding season;
- Require the Permit holder to monitor and maintain the installed artificial hollows for a period of at least 10 years; and
- Require the Permit holder to conduct pre-clearing inspection for western-ringtail possums.

Given the above, the Delegated Officer decided to grant a clearing permit to reflect the Minister's determination.

2. Site Information

Clearing Description The application is to clear 15.19 hectares of native vegetation within Lot 9005, Nullaki, Lee Road reserve, Browns Road reserve and Lake Saide Road reserve, Youngs Siding, for the purpose of extraction, road construction and road upgrades.

The clearing includes eight hectares for the proposed lime pit, which will be progressively cleared (two hectares at a time) and rehabilitated after lime source removed (Aurora, 2019).

The remaining 7.19 hectares of clearing is associated with the haulage road, Lee Road, Brown Road and Lake Saide Road reserves.

The proposed clearing areas is defined under Figure 1, with each area defined.

Vegetation Description

The application area is mapped within the following Mattiske vegetation complexes:

- Owingup (OW): Mosaic of open woodland of *Allocasuarina fraseriana*-*Banksia attenuata*-*Banksia ilicifolia*, low open woodland of *Melaleuca raphiophylla*-*Agonis juniperina*, low open woodland of *Melaleuca cuticularis* and tall shrubland of *Melaleuca densa* on broad swamps and plains in the hyperhumid zone;
- Collis 2 (Coy2): Open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla*-*Banksia grandis*-*Allocasuarina fraseriana* on low hills in the humid zone;
- Meerup (Mf): Low woodland of *Eucalyptus megacarpa*-*Agonis flexuosa*-*Allocasuarina fraseriana* on flats between dunes some distance from the coast in the hyperhumid zone; and
- Meerup (Mp): Mosaic of open low woodland of *Agonis flexuosa* with some *Eucalyptus cornuta*, tall shrubland of *Agonis flexuosa* with *Trymalium floribundum* in gullies and closed heath of *Olearia axillaris*-*Spyridium globulosum*-*Acacia littorea* on stabilised dunes in the hyperhumid zone.

The condition and structure of the vegetation under application was obtained via the following reports/surveys;

- Bio Diverse (2016) - Vegetation Communities Survey. Lot 9005 Rock Cliff Circle, Denmark
- PGV Environmental (2019) - Flora and Vegetation Survey. Lee Road reserve and Lot 9005 Rock Cliff Circle Emergency Access Track, Nullaki
- Aurora (2019a) - Vegetation Survey – Flora Surveys. Vegetation Mapping for Clearing Permit: Lee Road, Brown’s Road and Lake Saide Road Reserves, Youngs Siding
- Aurora (2019b) - Level 1 Fauna Survey Proposed Lime Pit and Access – Clearing Permit Application CPS 8392/1, Nullaki and Youngs Siding
- DWER Site Inspection Report (2019).

Table 1 describes the vegetation under application as identified within the abovementioned flora, vegetation and fauna surveys.

Table 1. Vegetation types identified within the application area

Application Area	Vegetation types
Pit Area Haulage Road Lee Road	Open Heath: Occurs in swales, flats and on crests of dunes. Where overstorey is present, it consists of low and scattered <i>Agonis flexuosa</i> , <i>Acacia cyclops</i> or <i>Banksia attenuata</i> in flats with low thickets of <i>Agonis flexuosa</i> on ridgelines and in swales. The southern areas closest to the coast have a complete absence of overstorey. The understorey consists of a diverse mix of species. The most dominant include: <i>Hakea varia</i> , <i>Allocasuarina humilis</i> , <i>Jacksonia horrida</i> , <i>Pultenaea reticulata</i> , <i>Spyridium globulosum</i> , <i>Adenanthos cuneatus</i> and <i>Banksia attenuata</i> . A mix of sedges, herbs and grasses form the basis of the groundcover, some of which include: <i>Lyginia imberbis</i> , <i>Lyginia barbata</i> , <i>Lepidosperma squamatum</i> , <i>Desmocladius flexuosus</i> , <i>Hypolaena exsulca</i> and <i>Opercularia hispidula</i> .
Haulage Road	Agonis Woodland: Dominated by tall <i>Agonis flexuosa</i> with occasional <i>Eucalyptus cornuta</i> with <i>Taxandria parviceps</i> , <i>Pultenaea reticulata</i> with <i>Banksia attenuata</i> and <i>B. grandis</i> .
Haulage Road	Taxandria Woodland: Open woodland with overstorey dominated by <i>Taxandria juniperina</i> with sparse <i>Agonis flexuosa</i> with understorey of <i>Olearia axillaris</i> and <i>Spyridium globulosum</i> with <i>Spyridium globulosum</i> , <i>Adenanthos</i> sp. <i>Banksia attenuata</i> , <i>Pultenaea reticulata</i> , <i>Hakea varia</i> .
Lee Road	Bullich – Banksia Woodland: <i>Eucalyptus megacarpa</i> , <i>Banksia littoralis</i> and <i>Agonis flexuosa</i> with <i>Xanthorrhoea preissii</i> , <i>Spyridium globulosum</i> , * <i>Psoralea pinnata</i> , <i>Acacia pulchella</i> and <i>Pultenaea reticulata</i> .
Lee Road	Bullich – Agonis Woodland: <i>Eucalyptus megacarpa</i> and <i>Agonis flexuosa</i> with <i>Bossiaea linophylla</i> and <i>Spyridium globulosum</i> over sedges and grasses. Some herbaceous weeds present.
Lee Road	Agonis – Yate Woodland: <i>Agonis flexuosa</i> with occasional <i>E. cornuta</i> with understorey of <i>Pteridium esculentum</i> , <i>Lepidosperma gladiatum</i> . Some grassy weeds present.
Brown Road	Yate and Agonis Woodland: <i>Eucalyptus cornuta</i> over <i>Agonis flexuosa</i> with <i>Lepidosperma gladiatum</i> , <i>Desmocladius flexuosus</i> and * <i>Psoralea pinnata</i> .
Brown Road	Wattie and Melaleuca Woodland: <i>Taxandria juniperina</i> over <i>Melaleuca</i> sp. with <i>Lepidosperma gladiatum</i> .

Brown Road Lake Saide Road	Marri and Jarrah Woodland: <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over <i>Agonis flexuosa</i> . Weedy understorey.
Lake Saide Road	Karri, Marri and Jarrah Forest: <i>Eucalyptus diversicolor</i> with <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over <i>Agonis flexuosa</i> . * <i>Psoralea pinnata</i> and grassy weeds in understorey.

*denotes *non-native species*

Vegetation Condition

Vegetation condition recorded across the application area ranges from Degraded to Pristine using the Keighery (1994) scale.

Vegetation condition ratings are defined as follows:

- Pristine: Pristine or nearly so, no obvious signs of disturbance (Keighery, 1994).
- Excellent: Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species (Keighery, 1994).
- Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate (Keighery 1994).
- Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management (Keighery 1994).
- Completely Degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery, 1994).

The condition of the vegetation within the respective clearing areas is:

- Lime Pit - 'Pristine'
- Haul Road - 'Degraded to Excellent'
- Lee Road - Degraded (western end where weeds are evident) to Excellent
- Browns Road - 'Very good to Degraded'
- Lake Saide Road - 'Good to Degraded'

Soil and Landform type

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

- Nullaki Dunes System (Unit 254NK) subsystem is described as high dunes, on the southern coast of Warren Denmark Southland. Calcareous deep sand and pale deep sand. Coastal scrub and peppermint-jarrah-marri woodland; and
- Broke System (Unit 254Br) is described as poorly drained plain with low granitic rises, along the coast of the Warren-Denmark Southland. Non-saline wet soil and pale deep sand. Sedges, tea-tree heath and paperbark-banksia woodlands.

It should be noted that the current mapping has not mapped the pit area. However, Nullaki Dunes System runs along the northern boundary of the proposed pit area, for the purpose of this assessment, it is assumed the pit area comprises of the Nullaki Dunes System.

Comment

The local area referred to in this assessment is defined as the area within a ten kilometre radius of the application areas unless indicated different within the assessment.



Figure 1: Map of the application area.

- Brown Road
- Lake Saide Road
- Lee Road
- Haulage Road
- Pit Area



Figure 2: Photo of the vegetation within Pit area.



Figure 3: Photo of the vegetation within haulage road. The haulage road is the existing fire break and requires additional clearing (approximately 1 metre) along left hand side.



Figure 4: Photo of vegetation within Lee road area undeveloped



Figure 5: Photo of vegetation next to the Lee Road wetland



Figure 6: Photo taken of vegetation within Browns Road



Figure 7: Photo taken of the vegetation within Lake Saide Road

3. Assessment of application against clearing principles, planning instruments and other relevant matters

This amendment is the result of an appeal determination made by the Minister for Environment regarding the conditions of Clearing Permit CPS 8392/1.

The assessment against the clearing principles outlined in Schedule 5 of the *Environmental Protection Act 1986* is unchanged and can be found in the Decision Report prepared for Clearing Permit CPS 8392/1.

The Minister determined that the proposed clearing may be at variance with clearing principle (b) from the evidence presented in the Report to the Minister for Environment prepared by the Appeals Convenor (Office of the Appeals Convenor, 2020).

Planning instruments and other relevant matters.

The assessment against planning instruments and other matters is unchanged and can be found in the Decision Report prepared for Clearing Permit CPS 8392/1.

4. References

- Aurora Environmental (2019b) Level 1 Fauna Survey Proposed Lime Pit and Access – Clearing Permit Application CPS 8392/1, Nullaki and Youngs Siding, City of Albany, Western Australia.
- Aurora Environmental (2019a) Vegetation Survey – Flora Surveys. Vegetation Mapping for Clearing Permit: Lee Road, Brown's Road and Lake Saide Road Reserves, Youngs Siding, City of Albany.
- Bio Diverse (2016) Vegetation Communities Survey. Lot 9005 Rock Cliff Circle, Denmark. Supporting Information for Clearing Permit Application CPS 8392/1.
- Department of Primary Industries and Regional Development (2017). NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: **Error! Hyperlink reference not valid.** (accessed February 2020)
- Department of Water and Environmental Regulation (2019) Site inspection report for Clearing Permit Application CPS 8392/1. Undertaken on the 27 June 2019 (DWER Ref: A1898245)
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Landform Research (2018) Excavation – Rehabilitation Management Plan, Proposed Agricultural Lime Quarry, Lot 9005, Nullaki Peninsula, City of Albany. Prepared for Graeme Robertson.
- Office of the Appeals Convenor (2020) Report prepared for Minister for Environment for Appeal against CPS 8151/1. Office of the Appeals Convenor. URL: <https://www.appealsconvenor.wa.gov.au/cps-83921-lot-9005-nullaki-and-lee-road-brown-road-and-lake-saide-road-reserves-youngs-siding-13>
- PGV Environmental (2019) Flora and Vegetation Survey. Lee Road reserve and Lot 9005 Rock Cliff Circle Emergency Access Track, Nullaki. For Clearing Permit Application CPS 8392/1.

GIS Databases:

- Aboriginal Sites of Significance
- DBCA Managed Estate
- Directory of Important Wetlands
- Groundwater salinity
- Geomorphic wetlands (classification) Swan Coastal Plain
- Hydrography, hierarchy
- Hydrography, linear
- Land Degradation datasets
- Mean annual rainfall
- NLWRA, Current Extent of Native Vegetation
- Position Statement for Wetlands
- SAC Bio Datasets (Accessed January 2020)
- Soils, Statewide
- Topographic contours
- Vegetation Complexes SW