GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9126/1

File Number: DWERVT7058

Duration of Permit: From 27 June 2022 to 27 June 2034

PERMIT HOLDER

Ietto Farms Pty Ltd

LAND ON WHICH CLEARING IS TO BE DONE

Lot 1504 on Plan 112303, Myalup

Lot 1498 on Plan 112301, Myalup

AUTHORISED ACTIVITY

The permit holder must not clear more than 23 hectares of *native vegetation* within the area cross-hatched yellow in Figures 1 and 2 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 27 June 2024.

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. Wind erosion management

The permit holder must commence the extraction of sand and/or limestone no later than three (3) months after undertaking the authorised *clearing* activities to reduce the potential for wind erosion. If extraction activities are not able to commence within three months of *clearing*, the permit holder must:

(a) place *brushing material* of local *provenance* within the cleared areas; or

(b) in the absence of suitable brushing material, spread the stockpiled topsoil over the cleared area and apply water between November and May to encourage germination; and

(c) ensure materials placed under *condition* 4 (a) and (b) of this permit are *maintained* until *revegetation* activities required under *condition* 6 of this permit are able to be undertaken

5. Fauna management – black cockatoo habitat

(a) Within 72 hours prior to undertaking any *clearing* authorised under this permit within the combined areas cross-hatched yellow on Figures 1 and 2 of Schedule 1, the permit holder must engage a *fauna specialist* to conduct a *fauna survey* of the permit area to identify *black cockatoo habitat tree/s* being utilised by *black cockatoo species* listed below:

(i) *Calyptorhynchus lateriosis* (Carnaby's cockatoo);

(ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo); and

(iii) *Calyptorhynchus baudinii* (Baudin's cockatoo).

(b) Where *black cockatoo habitat tree/s* are identified under *condition* 5(a), the permit holder must engage a *fauna specialist* to map *black cockatoo habitat tree/s* within the permit area.

(c) Each *black cockatoo habitat tree* identified must be inspected by a *fauna specialist* for *evidence* of current or past breeding use by *black cockatoo species*.

(d) Where a *black cockatoo habitat tree* with no *evidence* of current or past use by *black cockatoo species* is identified in accordance with *condition* 5(a), that tree must only be cleared immediately after the inspection.

(e) Where a *black cockatoo habitat tree* is identified within the combined areas cross-hatched yellow on Figures 1 and 2 of Schedule 1 and that tree shows *evidence* of current or past breeding use by *black cockatoo species* under *condition* 5(c), and *clearing* of that tree cannot be avoided, that tree must be monitored by a *fauna specialist* to determine when it is no longer in use for that breeding season.

(f) Any *black cockatoo breeding tree* with *evidence* of current breeding use by *black cockatoo species* must not be cleared whilst it is in use for that breeding season as determined by the *fauna specialist* under *condition* 5(e).

(g) For each *black cockatoo breeding tree* with *evidence* of current or past breeding use by *black cockatoo species* identified that cannot be avoided, the permit holder must install an artificial black cockatoo nest hollow.

(h) Each artificial black cockatoo nesting hollow required by *condition* 5(g) must be installed prior to commencement of any *clearing* activities otherwise authorised under this permit.

(i) The artificial black cockatoo nest hollow(s) required by *condition* 5(g) of this permit must:

(i) be installed within the area cross-hatched red on Figure 3 of Schedule 1;

(ii) be designed and placed in accordance with the specifications detailed in Schedule 3; and

(iii) be monitored and maintained in accordance with the specifications detailed in Schedule 3, for a period of at least ten years.

(j) Within two months of *clearing* authorised under this permit within the combined areas cross-hatched yellow on Figures 1 and 2 of Schedule 1, the permit holder must provide the results of the *fauna survey* in a report to the *CEO*.

(k) The *fauna survey* report must include the following;

(i) the location of the *black cockatoo habitat tree(s)* recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(ii) the location of any fauna species listed in *condition* 5(a), if identified, recorded using a GPS unit set to GDA94/2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(iii) the name and amount of each fauna species identified;

(iv) whether the *black cockatoo habitat tree/s* identified show current or past use by black cockatoo species;

(v) the methodology, used to survey the permit area;

(vi) a photo of the *black cockatoo habitat tree(s)* identified; and

(vii) a description of the *black cockatoo habitat tree(s)* identified, including the:

(A) species of *black cockatoo habitat tree(s)*; and
(B) *condition* of the *black cockatoo habitat tree(s)*.

6. Revegetation and rehabilitation – retention of vegetative material and topsoil

The permit holder must within 12 months of commencement of *clearing*, and at an *optimal time* the first winter following *clearing* authorised under this permit, implement '*Rehabilitation Management and Monitoring Plan Lots 1498 and 1504 Finn Road Myalup (Harley Dykstra Pty Ltd, 2022)*' within the areas cross hatched green on Figure 4 of Schedule 1, including but not limited to the following actions;

(a) retaining the vegetative material removed by *clearing* authorised under this permit and stockpiling the vegetative material in an area that has already been cleared;

(b) ripping the ground on the contour to remove soil compaction

(c) spreading the vegetative material and topsoil removed by *clearing* authorised under this permit;

(d) fencing the *revegetation* and *rehabilitation* areas as specified in the '*Rehabilitation Management and Monitoring Plan Lots 1498 and 1504 Finn Road Myalup (Harley Dykstra Pty Ltd, 2022)*';

(e) establishing photographic monitoring sites within the *revegetated* and *rehabilitated* areas (excluding *pasture rehabilitation* areas) as described in '*Rehabilitation Management and Monitoring Plan Lots 1498 and 1504 Finn Road Myalup'*;

(f) implementing hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;

(g) undertaking *weed* control activities bi-annually;

(h) undertaking deliberate *planting* of *native vegetation* as listed in '*Rehabilitation Management and Monitoring Plan Lots 1498 and 1504 Finn Road Myalup (Harley Dykstra Pty Ltd, 2022)'*

(i) achieving the following *completion criteria* after the three-year monitoring period for the areas *revegetated* and *rehabilitated* within the areas cross hatched green on Figure 4 of Schedule 1;

Table 1: Revegetation completion criteria

Criterion	Aspect	Completion criteria	Monitoring
A	Species richness	At least eight native species	Biannual for a period of three years after the extractive activities have ceased
B	Declared *weed*s	No declared *weed*s are present within the revegetation site	Biannual for a period of three years after the extractive activities have ceased
C	Survival rate	Minimum 80 per cent survival of species planted under conditions of this permit.	Biannual for a period of three years after the extractive activities have ceased

(j) undertake remedial actions for areas *revegetated* and *rehabilitated* where monitoring indicates that *revegetation* and *rehabilitation* has not met the *completion criteria*, outlined in *condition* 6(i), including;

(i) revegetate the area by deliberately *planting native vegetation* and/or *direct seeding native vegetation* that will result in the minimum target in condition 6(i) and ensuring only *local provenance* propagating material are used;

(ii) undertake further *weed* control activities; and

(iii) annual monitoring of the *revegetated* and *rehabilitated* areas, by an *environmental specialist* is to be undertaken until the *completion criteria* outlined in *condition* 6 (i) are met.

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 2.

Table 2: 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 (GDA94/2020), 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; and (g) actions taken to minimise the risk of erosion in accordance with condition 4;
2.	In relation to black cockatoo fauna management pursuant to conditions 5	(a) the time(s) and date(s) of inspection(s) of the suitable *black cockatoo habitat tree* by the *fauna specialist*; (b) a description of the inspection methodology employed by the *fauna specialist*; (c) the species name of any fauna determined by the *fauna specialist* to be occupying the suitable *black cockatoo habitat tree*;

No.	Relevant matter	Specifications
		(d) where the suitable *black cockatoo habitat tree* is determined by the *fauna specialist* to be occupied by *black cockatoo species*: (i) the time and date that it was determined to be no longer occupied; and (ii) a description of the evidence by which it was determined to be no longer occupied; and (e) the time and date that the suitable *black cockatoo habitat tree* was cleared.
3.	In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 6	(a) the size of the area *revegetated* and *rehabilitated*; (b) the date(s) on which the area *revegetation* and *rehabilitation* was undertaken; (c) the boundaries of the area *revegetated* and *rehabilitated* (recorded digitally as a *shapefile*). (d) a description of the *revegetation* and *rehabilitation* activities undertaken in accordance with Condition 6; and (e) photographic evidence of areas *revegetated* and/or *rehabilitated* under condition 6 of this permit

8. Reporting

(a) The permit holder must provide to the *CEO*, on or before 31 December of each calendar year, a written report containing:

(i) the records required to be kept under *condition* 7; and

(ii) records of activities done by the permit holder under this permit between 1 July of the preceding calendar year and 30 June of the current calendar year.

(b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been undertaken, must be provided to the *CEO* on or before 31 December of each calendar year.

(c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of the permit, a written report of records required under *condition* 7, where these records have not already been provided under *condition* 8(a).

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DEFINITIONS

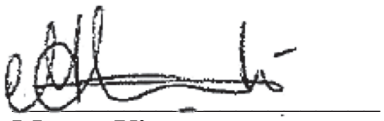
In this permit, the terms in Table 3 have the meanings defined.

Table 3: 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) *Calyptorhynchus lateriosis* (Carnaby's cockatoo); (b) *Calyptorhynchus baudinii* (Baudin's cockatoo); and/or (c) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
brushing material	means vegetative matter
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.
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.
dieback	means the effect of *Phytophthora* species on native vegetation.
EP Act	*Environmental Protection Act 1986* (WA)
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of 2 years work 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.
evidence	evidence means showing chew marks or scratchings on the habitat tree representative of the species being surveyed, the presence of the species entering or leaving the habitat tree, and/or the presence of chicks/young.
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*.
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.

Term	Definition
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from May to September for undertaking planting and seeding.
pasture rehabilitation	means area described as the area of 23 hectares that will be rehabilitated to pasture as described within the document 'Rehabilitation Management and Monitoring Plan, Lots 1498 and 1504 Finn Road Myalup'
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting saplings of the desired species.
rehabilitate / rehabilitated / rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate / vegetated / revegetation	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.
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



Meenu Vitarana
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

2 June 2022

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1 and Figure 2).

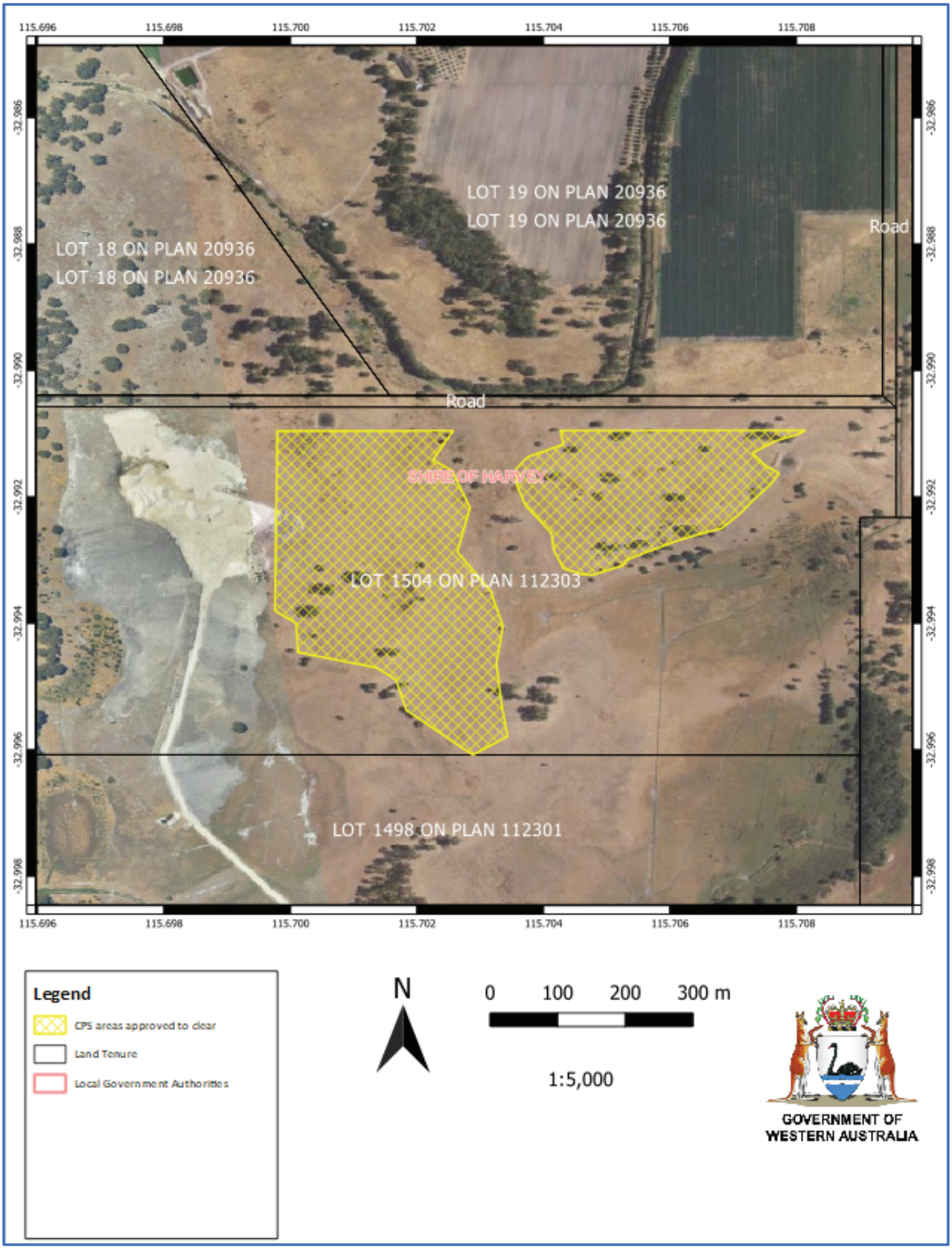


Figure 1: Map of the boundary of the area within which clearing may occur

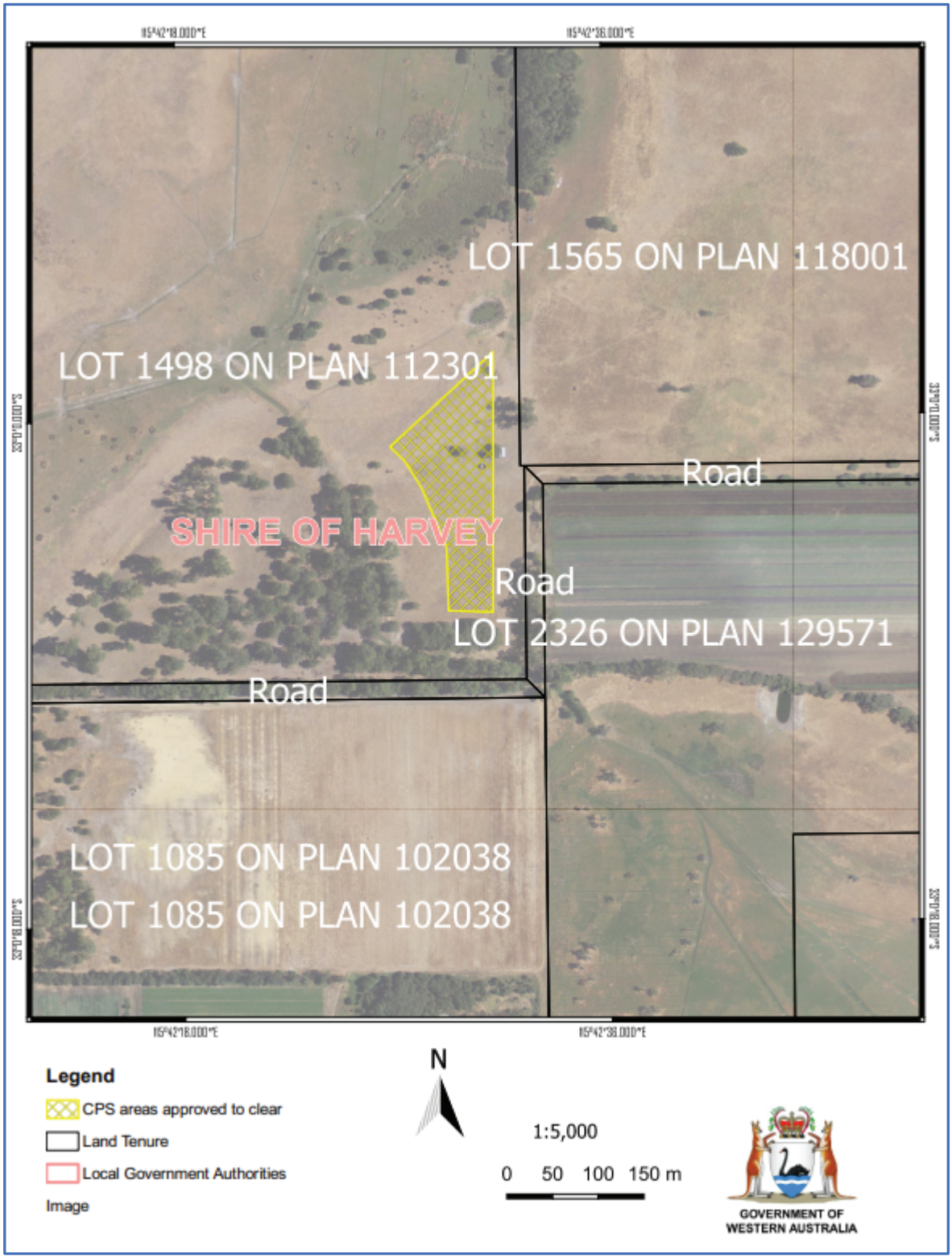


Figure 2: Map of the boundary of the area within which clearing may occur

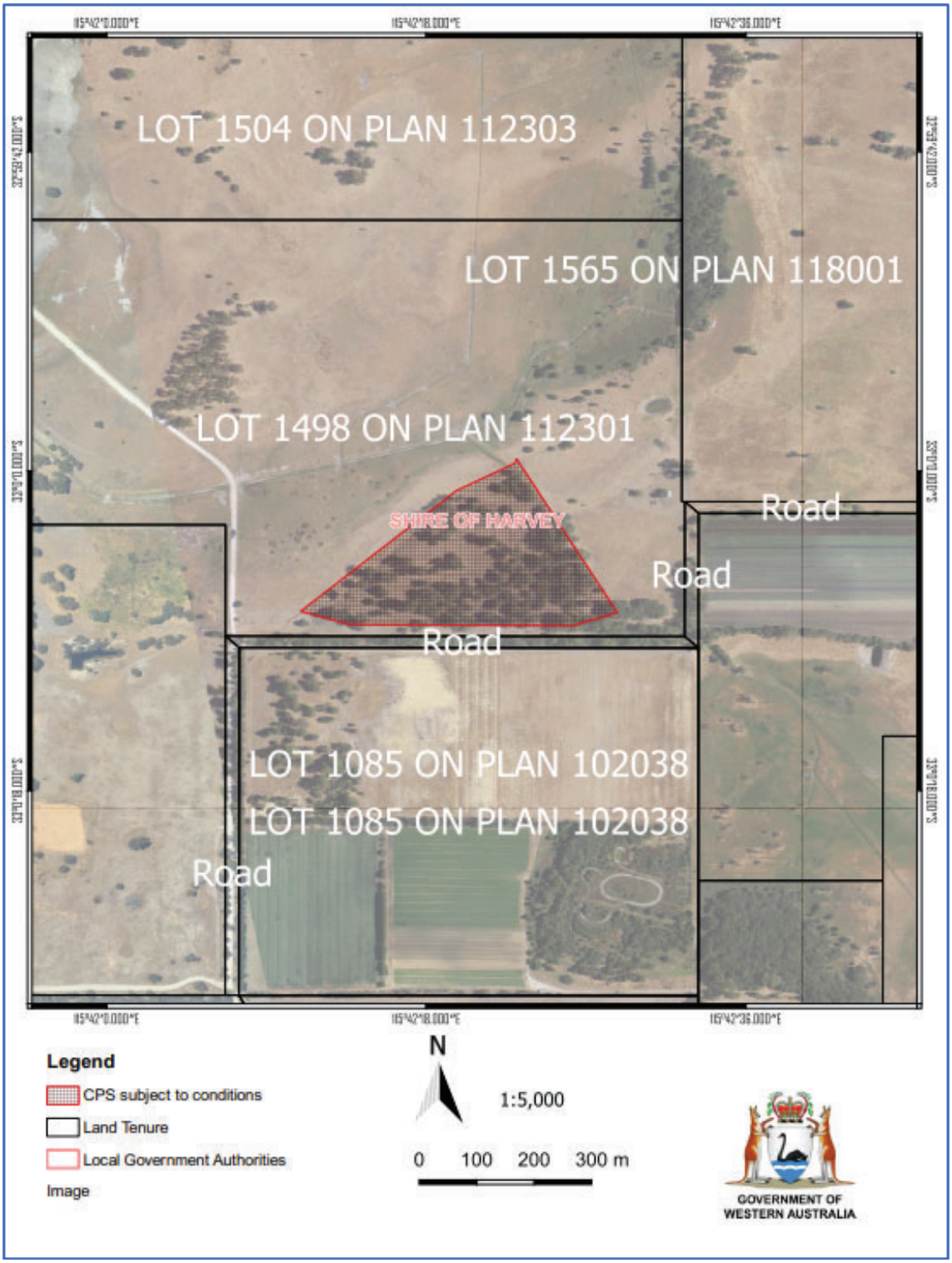


Figure 3: Map of the boundary of area subject to conditions

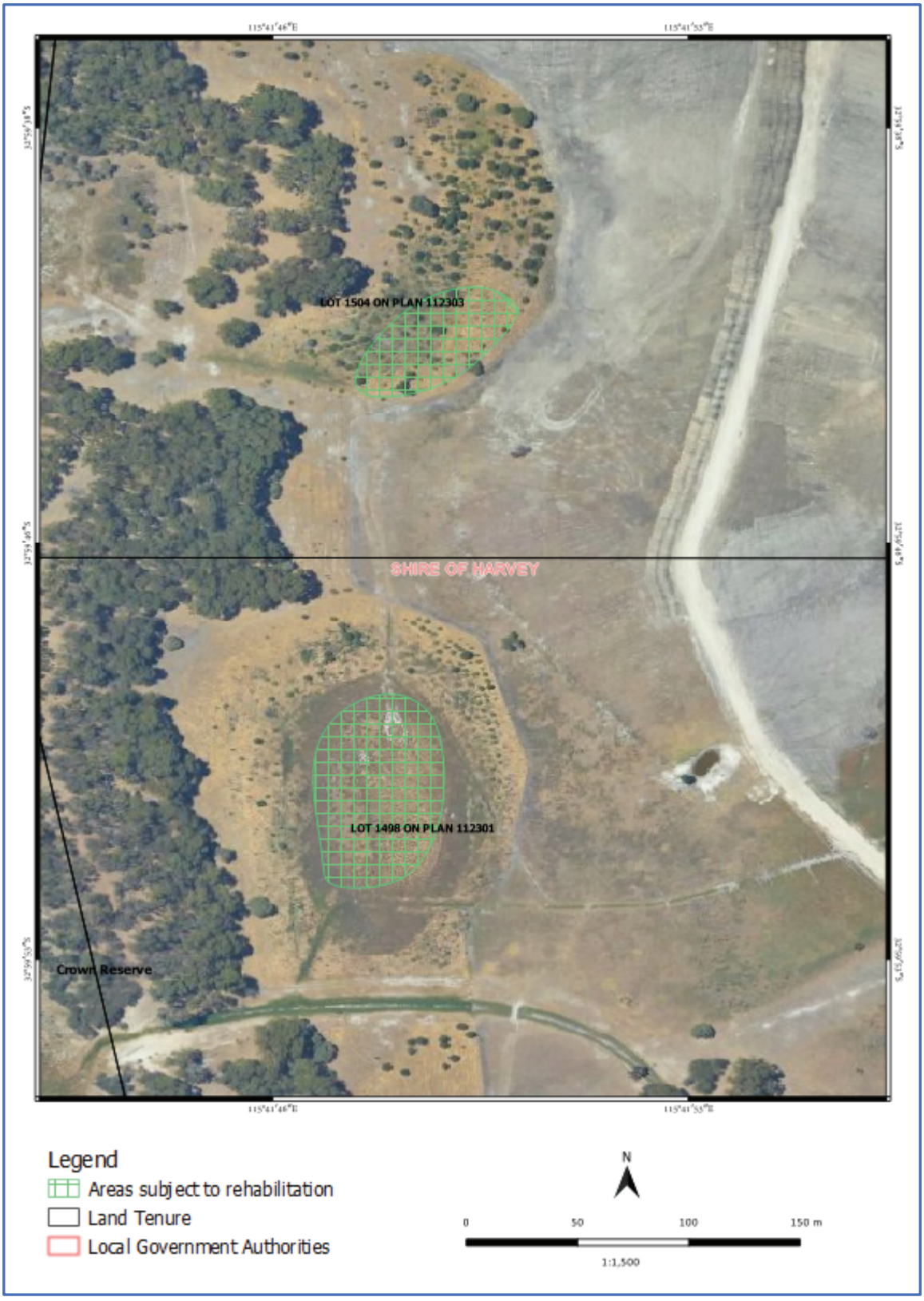


Figure 4: Map of the boundary of area subject to conditions

SCHEDULE 2

How to design and place 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. 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.

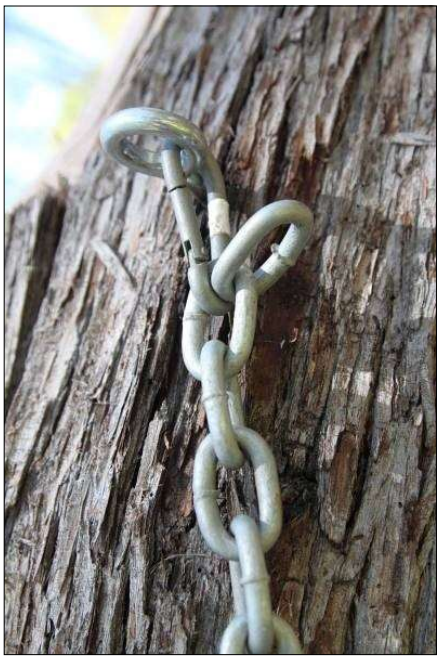
Maintenance and monitoring

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

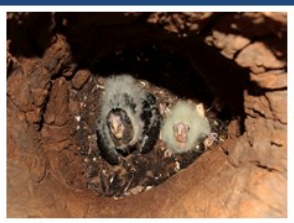
- *How to design and place artificial hollows for Carnaby's cockatoo*
- *How to monitor and maintain artificial hollows for Carnaby's cockatoo*

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

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

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 9126/1
Permit type:	Area permit
Applicant name:	Ietto Farms Pty Ltd
Application received:	30 November 2020
Application area:	23 hectares of native vegetation
Purpose of clearing:	Extractive industry
Method of clearing:	Mechanical
Property:	Lot 1504 on Deposited Plan 112303 Lot 1498 on Deposited Plan 112301
Location (LGA area/s):	Shire of Harvey
Localities (suburb/s):	Myalup

1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed across three separate areas (see Figures 1 and 2, Section 1.5). The application is to clear grasses, trees and shrubs within a 23-hectare footprint, with machinery and burning, to allow for extraction of limestone and sand.

The application was revised during the assessment process, in response to the environmental concerns identified within a preliminary assessment report prepared by the Department of Water and Environmental Regulation (DWER). The changes included a modification to area C to avoid impacts to the potential occurrence of a TEC. These changes are outlined in Appendix A with impacts addressed within Section 3.

1.3. Decision on application

Decision:	Granted
Decision date:	2 June 2022
Decision area:	23 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 no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the supporting information provided by the applicant (Appendix A and Appendix E), the

clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.3).

The assessment identified that the proposed clearing will result in:

- potential loss of habitat trees for black cockatoos (*Calyptorhynchus lateriosis* (Carnaby's cockatoo), *Calyptorhynchus baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo), and
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- the potential of wind erosion causing land degradation.

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 have long-term adverse impacts on black cockatoo species, the adjacent vegetation or land degradation and can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values via permit conditions.

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,
- revegetate and rehabilitate the extracted areas to pasture
- undertake staged clearing to minimise wind erosion; and
- fauna management conditions to inspect trees for black cockatoo breeding activity.

1.5. Site map

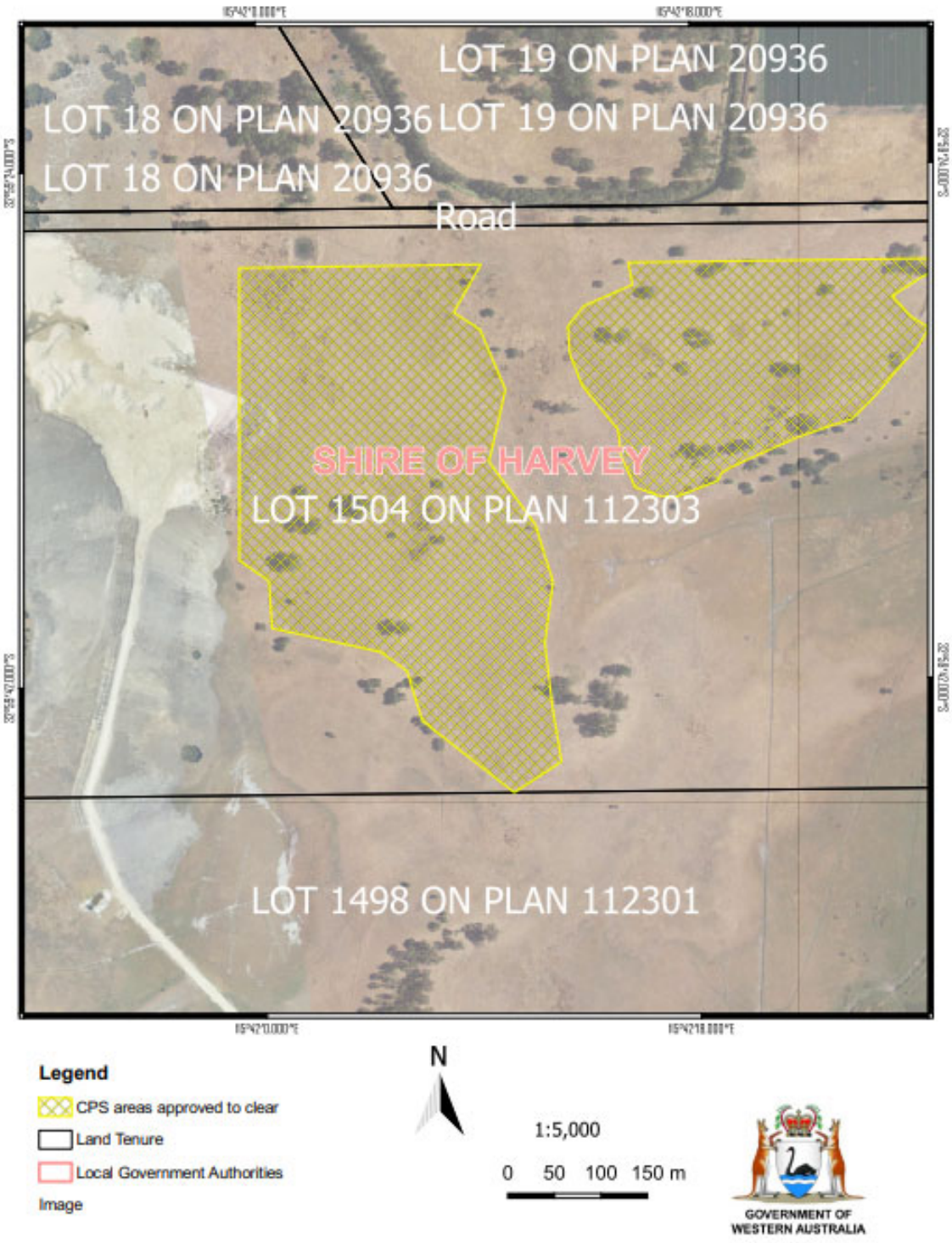


Figure 1 Map of the application area

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

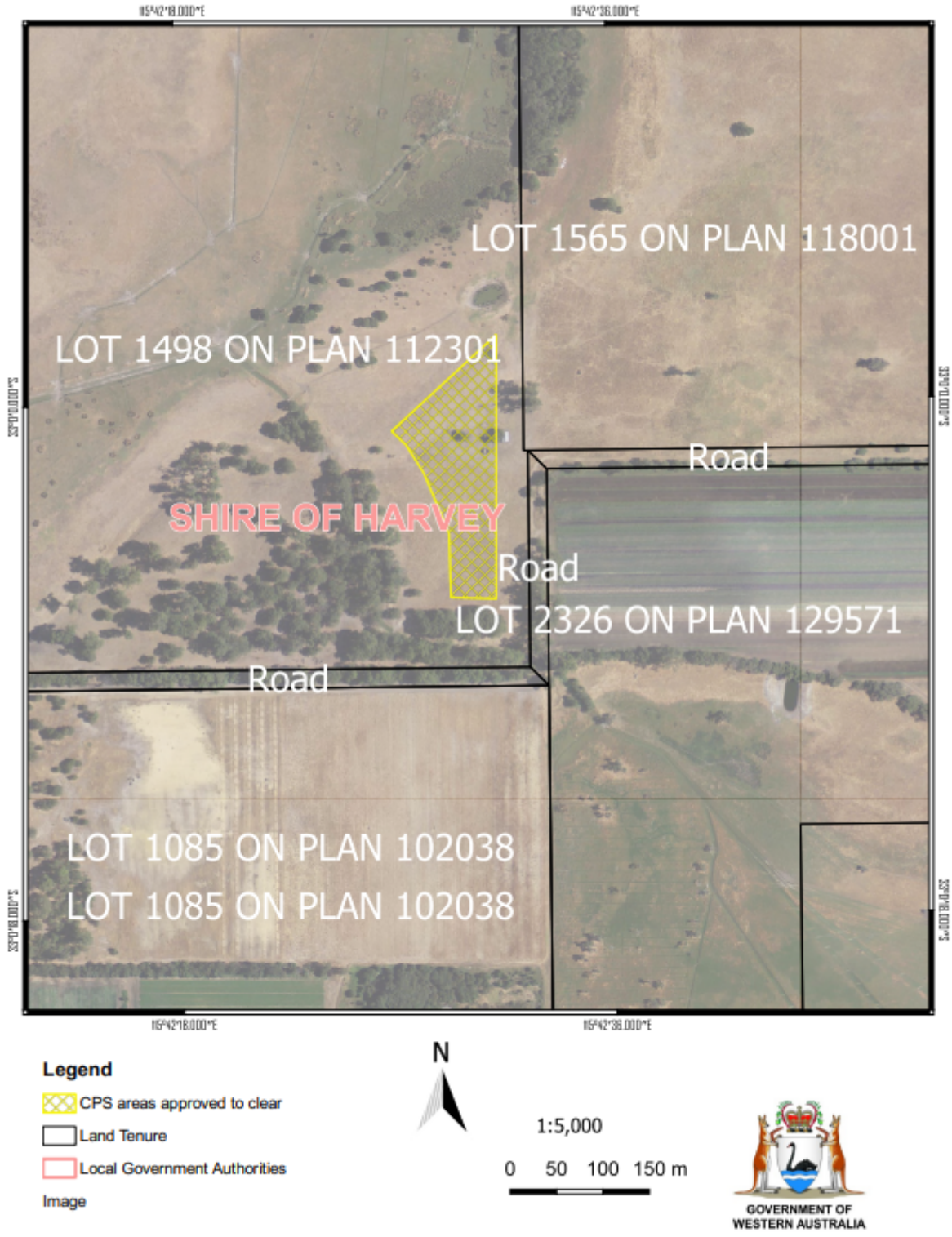


Figure 2 Map of the application area

The area 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 polluter pays principle
- 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)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D 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)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that areas of high value vegetation are being avoided. In addition to this, the application area was further modified to avoid impacts to a mapped occurrence of a Threatened Ecological Community (As detailed below in 3.2.2). 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 B) 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 C) identified that the impacts of the proposed clearing present a risk to biological values (fauna and adjacent vegetation (TEC)), and land degradation. 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 (fauna) - Clearing Principle (b)

Assessment

Available data sources indicate several avian fauna species located within the local area which have habitat preferences likely to be represented within the application area. It is considered the following species may occur:

- *Calyptorhynchus latirostris* (Carnaby's cockatoo)
- *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo)
- *Calyptorhynchus baudinii* (Baudin's cockatoo)

Two additional arboreal species have been recorded within the local area: *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale) and *Pseudocheirus occidentalis* (western ringtail possum). These records are from areas that does not have vegetation connectivity with the application area and are separated by roads and other disturbances. Given this, and that the application area contains sparse and scattered native trees over pasture that does not have connecting canopies, it is considering that the vegetation within the application area does not provide habitat for these species.

Given the absence of understory, the application area is not likely to contain habitat suitable for ground dwelling species.

Black cockatoos

The application area is within the outskirts of the Baudin's cockatoo distribution but is within the core habitat for forest red-tailed black cockatoo and the known breeding distribution of Carnaby's cockatoo. The application area may contain hollow bearing trees (breeding habitat) and night roosting habitat for these species.

Foraging habitat
Foraging habitat for black cockatoo species includes foraging material that is within an approximate 6–12-kilometre radius of nesting site and within 6 kilometres of a night roosting site. The preferred foraging habitat for each of the species is described below:

- Carnaby's cockatoo – Native shrubland, kwongan healthland and woodland dominated by proteaceous plant species such as Banksia spp, Hakea spp. and Grevillea spp. The species also forages in pine plantations and eucalypt woodland.
- Forest red-tailed black cockatoo – jarrah and marri woodlands and forest, edges of karri forests including wandoo and blackbutt within the range of the species
- Baudin's cockatoo – Eucalypt woodlands and forest, proteaceous woodland, and heath. Primarily feeding on marri during the breeding season and non-native species outside of the breeding season.

Photographs provided by the applicant (Appendix E), show the vegetation within the application area consists of scattered and sparse occurrences of *Agonis flexuosa, Eucalyptus gomphocephala and Melaleuca rhaphiophylla* trees over pasture weeds in a Completely Degraded (Keighery, 1994) condition.

The application area is not likely to represent significant or high value foraging habitat for Carnaby's cockatoo due to the absence of proteaceous plant species occurring within the application area. Foraging value of the application area for the other two black cockatoo species is considered low due to the absence of marri species, the occurrence of less preferred foraging species (Appendix B.1) and the sparse and scattered nature of the vegetation occurring within the application area.

Breeding habitat
'Breeding habitat' for species of black cockatoos is defined within the referral guidelines as trees of a species known to support breeding within the range of the species which either have a suitable nest hollow or are suitable diameter at breast height (DBH) to develop a nest hollow. For the tree species present within the application area, the suitable DBH is 500 millimetres (Commonwealth of Australia, 2012).

The applicant has provided additional photographs of the eleven large trees that occur within the application area and a summary of the trees by species, location, and the absence/presence of hollows (Appendix E, Table 2). Some of the photographs provided are obscured by the foliage within the canopy. Noting this and that some of the trees contain hollows, the application area may provide breeding habitat for black cockatoos.

Night Roosting
Night roosting habitat is common between the three species of black cockatoos with flocks of cockatoos using multiple sites during the year as they move across the landscape foraging. Night roost sites are normally associated within foraging habitat and is normally associated with a water source and within the tallest trees within an area.

Tuart trees are listed as being both night roosting and breeding trees for all three species of black cockatoos (Commonwealth of Australia, 2012) and have been recorded within the application area. Given that the local area retains approximately 40 per cent remnant vegetation that is likely to contain similar habitat, the limited number of trees within the application area are not considered to be significant as night roosting habitat.

Conclusion
Based on the above assessment, the proposed clearing may result in the loss of habitat for black cockatoo species, in particular breeding trees if the hollows area suitable.

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

- Inspection of tree hollows immediately prior to the clearing to determine the presence of black cockatoo breeding activity and the installation of artificial hollows if suitable hollows

3.2.2. Biological values (threatened ecological communities) - Clearing Principle (d)

The application area is adjacent to a mapped occurrence of Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community (TEC) (listed as Critically Endangered under the EPBC Act 1999). If is not considered that the Tuart trees within the application area meet the criteria as described within the guideline due to distance between individual trees and tree canopy.

The published guideline 'Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community' defines buffer zones adjacent to patches of the vegetation community that are important for protecting the integrity of the community but are not part of the community. The buffer zones protect root zones on edges of trees and other components from spray drift, weed invasion, water runoff, water extraction and other damage. Measurements of such buffers are 30 meters from the edge of a patch of community, whereby a patch is an additional 30 meters from the extent of the patch canopy as noted within the guideline (Commonwealth of Australia, 2019). The diagram below shows the mapped occurrence of the Tuart TEC and a 60-meter buffer around it to incorporate the 30-meter edge of patch plus the additional 30-meter buffer for the TEC (Figure 3). The buffers were applied to the mapped patch of TEC adjacent to the application area (Figure 4).

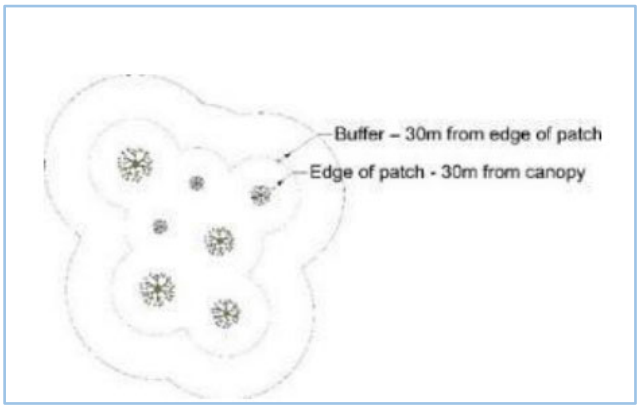


Figure 3: Explanatory diagram of the buffer recommendations for the Tuart Woodlands and Forests of the Swan Coastal Plain (Commonwealth of Australia, 2019)

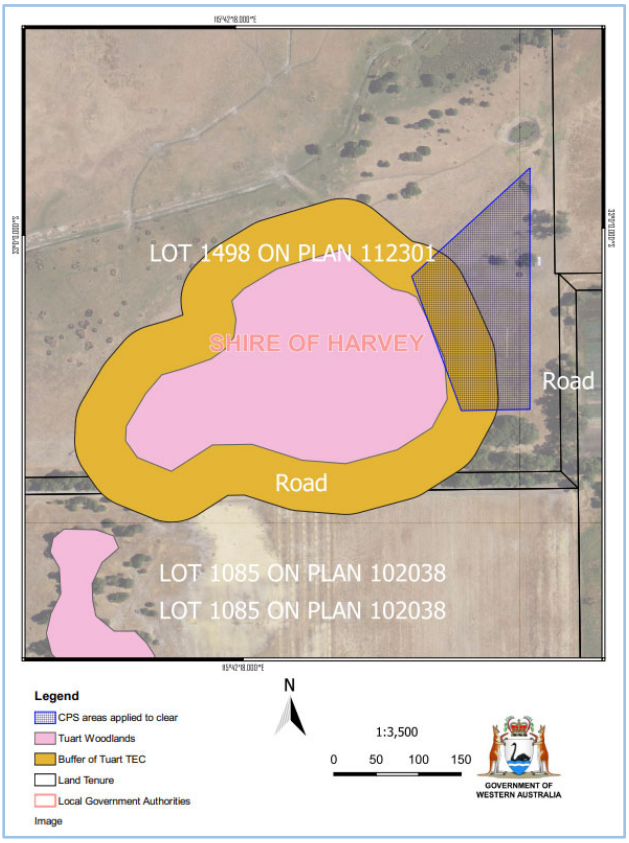


Figure 4: The original application area intersected the edge of the TEC patch and the buffer

Conclusion
Noting the recommendation of the 30 meters from the edge of canopy to be inclusive of a patch and the additional 30 meters beyond this to include the recommended buffer to protect occurrences of the Tuart TEC, the applicant agreed to revise the application area to align with these recommendations.

The proposed clearing has the potential to introduce weeds and dieback into the adjacent vegetation which could degrade the TEC.

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

- Weed and dieback management conditions

3.2.3. Biological values (conservation areas) - Clearing Principle (h)

Assessment
The application area is within 430 meters of the Yalgorup National Park. This National Park stretches from just south of Mandurah to north of Myalup and covers an area of 12,888 hectares, including ten lakes and a wetland system that has achieved international recognition as an important area for migratory waterbirds.

The area of the National Park closest to the application area is Lake Preston which is also considered under Principle (i). The application area is separated by these conservation areas by open spaces with sparse vegetation.

Conclusion
The proposed clearing is not likely to impact the vegetation within conservation areas due to the open spaces between the vegetation to be cleared and the vegetation within the conservation areas.

Conditions
While the risk of weeds spreading from the proposed clearing into adjacent conservation areas is low, the proposed clearing still poses risk of weeds and dieback to adjacent vegetation. A weed and dieback condition to manage this risk has been included within the clearing permit.

3.2.4. Biological values (: land and water resources) - Clearing Principles (f, g, I and j)

Assessment
As noted above, the application area is within 430 meters of a National Park (Yalgorup) which includes Lake Preston. In addition, there are some drains and wetlands surrounding the application area. Advice received in relation to water quality noted that the vegetation within the application area is sparse and there are no perceived risks to water quality by the removal of the native vegetation and that any water quality risks are addressed through the land use planning process in relation to surface and groundwater (DWER, 2021).

The application area contains Juncus and Melaleuca species which are considered riparian, however, considering the sparse patches that exist within the application area, it is considered the function of the vegetation in relation to surface water protection is minimal with occurrences of these species located within the margins of intersection of a multiple use dampland which intersects the application area. Multiple use wetlands are considered to have few remaining important attributes and functions, with the use, development, and management to be considered in the context of ecologically sustainable development and best management practice catchment planning (DBCA 2017).

Majority of the soils mapped within the application area have a high risk of wind erosion. Noting this, the proposed clearing has the potential for wind erosion resulting in appreciable land degradation. Part of the application area is mapped as having a high risk of waterlogging, particularly in areas mapped as a multiple use wetland. However, given the area of intersection is marginal and the footprint of clearing is mostly grasses, the removal of the trees is not considered likely to contribute to increased risk of waterlogging.

Conclusion
Based on the above assessment, the proposed clearing may result in land degradation in the form of wind erosion.

The proposed clearing includes some trees and minor amounts of sparse riparian vegetation over grasses, of which, the removal is not likely to have a significant impact on the quality of groundwater or surface water. The final land use poses risk to these qualities and are addressed through Shire planning processes in consultation with DWER.

Conditions

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

- To minimise the risk of wind erosion, the applicant will be required commence the extraction of materials within three months of the date of clearing, which will prevent the prolonged exposure of bare sandy soils.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Development approval under the *Planning and Development Act 2005* (issued by the Shire of Harvey)
- Extractive Industry Licence (issued by the Shire of Harvey)
- Licence issued under Part V Division 3 of the EP Act. (Granted 25 February 2022: L9296/2021-1)

The Shire of Harvey advised DWER that local government approvals are required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The Shire has provided the applicant a Development Approval and an Extractive Industry Licence.

The proposed clearing was referred to the Environmental Protection Authority in 2021 by a third party, with the decision from the EPA being not to assess the proposal (EPA, 2021).

No Aboriginal sites of significance have been mapped within the application area. The closest to the application area is artefacts/scatter site located approximately 800 meters from the application area at its closest point. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Additional information provided by applicant

During the assessment, a request for information was sent to the applicant noting that further detail was required to address concerns for fauna habitat within the application area. The applicant was requested to provide photographs and GPS coordinates of all large trees within the application area showing the upper trunk and canopy and any hollows in trunks of branches. The applicant provided photographs of 11 mature trees within the application area. The photographs and supporting information can be found within Appendix E.

The applicant was also requested to further avoid and minimise impacts on a mapped occurrence of 'Tuart Woodlands and Forests of the Swan Coastal Plain' by reducing part of the application area. This is discussed within Section 3.1 and within Appendix C.

The applicant was notified that the activity of screening materials (sand etc) may require further regulatory instruments if categorised as a prescribed premises under the *Environmental Protection Regulations 1987.* This matter has been addressed with the applicant being issued a Licence under Part V Division 3 of the EP Act as noted above within Section 3.3 Relevant planning instruments and other matters.

The applicant was also advised that further approvals from the local government (the Shire of Harvey) were also likely required. A Development Approval for the extractive industry and an Extractive Industry Licence (EIL) have been granted by the Shire of Harvey.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared consists of small, isolated patches of native vegetation in the intensive land use zone of Western Australia. It is surrounded by rural properties and is adjacent to Lake Preston. Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 40 per cent of the original native vegetation cover.
Ecological linkage	The application area is not part of any formal linkages and is not considered likely to form any informal linkage due to the area consisting of mostly isolated trees and shrubs.
Conservation areas	The application area is adjacent to Lake Preston which is within the Yalgorup National Park.
Vegetation description	Photographs and information provided by the applicant indicate the vegetation within the proposed clearing area consists of *Agonis flexuosa*, *Eucalyptus gomphocephala*, *Melaleuca rhaphiophylla*, *Juncus kraussii* and *Melaleuca huegelii*. Representative photos are available in Appendix D. This is reasonably consistent with the mapped vegetation type: Yoongarillup Complex, which is described as Woodland to tall woodland of *Eucalyptus gomphocephala* (Tuart) with *Agonis flexuosa* in the second storey. Less consistently an open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri). South of Bunbury is characterized by *Eucalyptus rudis* (Flooded Gum)-Melaleuca species open forests. The mapped vegetation type retains approximately 38 per cent of the original extent (Government of Western Australia, 2019). The detailed vegetation extents are contained in Section B.2.
Vegetation condition	Photographs provided by the applicant indicate the vegetation within the proposed clearing area is in degraded to completely degraded (Keighery, 1994) condition, described as: • Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management

Characteristic	Details
	• Completely degraded: The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species The full Keighery (1994) condition rating scale is provided in Appendix D.
Climate and landform	The application area is within a flat landscape with the area being only as high as five meters above sea level. The mapped groundwater salinity within the application area is 500-1000 milligrams per litre. The mean annual rainfall from 1995-2021 is 718 millimetres.
Soil description	The soil is mapped as: • Spearwood S2b Phase: Lower slopes (1-5%) of dune ridge with shallow to deep siliceous yellow-brown sands and common limestone outcrop. • Spearwood S4b Phase: Flat to gently undulating sandplain with shallow to moderately deep siliceous yellow-brown and grey-brown sands with minor limestone outcrop. • Spearwood S6 Phase: Flat stony plain with poorly drained shallow siliceous sands and large areas of bare limestone pavement. • Spearwood wet, swamp Phase: Swamp.
Land degradation risk	The mapped soil types typically have a high risk of wind erosion except for the Spearwood wet, swamp phase which has a low risk of wind erosion. This soil type has a high risk of waterlogging, phosphorus export risk and subsurface acidification. The Spearwood S6 phase also has a medium to high risk of waterlogging and phosphorus export risk.
Waterbodies	The desktop assessment and aerial imagery indicated that the application area slightly intersects a multiple use dampland. No mapped watercourses intersect the application area.
Hydrogeography	The application rea is within the Southwest Coastal Groundwater Area. The mapped soil types have low risk of salinity. In addition, the mapped groundwater salinity is marginal.
Flora	According to available databases, there are 22 species of conservation significant flora within 10 kilometres of the application area.
Ecological communities	Five ecological communities are mapped within 10 kilometres of the application area: • Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (listed as Priority 3 by Department of Biodiversity Conservation and Attractions (DBCA) and listed as Endangered under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) • Living microbial mats in hypersaline ponds (a Priority 2 ecological community) • Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain (Priority 3 by DBCA) and listed as Critically Endangered under EPBC Act. • Stromatolite like freshwater microbialite community of coastal brackish lakes (Lake Clifton) (Critically Endangered under the *Biodiversity Conservation Act 2016* (BC Act) • Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in in Gibson et al. (1994)) (Vulnerable under the BC Act)
Fauna	Available databases present records of 25 fauna species (433 records in total) within 10 kilometres of the application area. Of the 25 fauna species located within the local area, the most frequently recorded species is Carnaby's cockatoo (*Calyptorhynchus latirostris*).

B.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*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Yoongarillup Complex**	27,977.93	10,018.14	35.81	5,151.57	18.41
Local area					
10km radius			40.15	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

B.3. 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 (local area)	Are surveys adequate to identify? [Y, N, N/A]
Neophoca cinerea (Australian sea-lion)	VU	N	N	1.8	1	N/A
Calyptorhynchus baudinii (Baudin's cockatoo)	EN	Y	Y	2.0	4	N
Calyptorhynchus latirostris (Carnaby's cockatoo)	EN	Y	Y	2.5	143	N
Westralunio carteri (Carter's freshwater mussel	VU	N	N	3.5	1	N/A
*Ctenotus ora (*Coastal Plains skink)	P3	Y	Y	10	1	N
Tringa nebularia (Common greenshank)	MI	N	N	7.7	2	N/A
Thalasseus bergii (Crested tern)	MI	N	N	3.0	5	N/A
Calidris ferruginea (curlew sandpiper)	CR	N	N	7.7	2	N/A
Numenius madagascariensis (Eastern curlew)	CR	N	N	7.7	1	N/A
Plegadis falcinellus (Glossy ibis)	MI	N	N	9.3	1	N/A
Synemon gratiosa (Graceful sunmoth)	P4	N		9.4	20	N
Charadrius leschenaultii (Greater sand plover)	VU	N	N	7.2	1	N/A
Thinornis rubricollis (hooded plover)	P4	N	N	1.8	113	N/A
Falco peregrinus (Peregrine falcon)	OS	Y	N	6.5	1	N
Lerista lineata (Perth slider)	P3	Y	Y	8.7	3	N
Isoodon fusciventer (Quenda)	P4	Y	Y	8	77	N
Calidris ruficollis (Red-necked stint)	MI	N	N	7.7	14	N/A

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 (local area)	Are surveys adequate to identify? [Y, N, N/A]
Arenaria interpres (Ruddy turnstone)	MI	N	N	2.7	1	N/A
Calidris acuminata (Sharp-tailed sandpiper)	MI	N	N	7.7	1	N/A
Thalassarche cauta cauta (Shy albatross)	MI	N	N	10	1	N/A
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale)	CD	Y	Y	1.3	3	N
Notamacropus irma (Western brush wallaby)	P4	N	N	5	1	N/A
Falsistrellus mackenziei (Western false pipistrelle)	P4	N	N	3.7	10	N/A
Pseudocheirus occidentalis (western ringtail possum, ngwayir	CR	N	N	3.8	10	N/A

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

B.4. Land degradation risk table

Risk categories	Spearwood S2b Phase
Wind erosion	>70% of map unit has a high to extreme wind erosion risk
Water erosion	10-30% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	<3% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of the map unit has a moderate to high flood risk
Water logging	<3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	>3% of the map unit has a moderate to high flood risk

Risk categories	Spearwood S4b Phase
Wind erosion	>70% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	<3% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of the map unit has a moderate to high flood risk
Water logging	<3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	<3% of map unit has high to extreme phosphorus export risk

Risk categories	Spearwood S6 Phase
Wind erosion	50-70% of map unit has a high to extreme wind erosion risk
Water erosion	10-30% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	10-30% of map unit has a high subsurface acidification risk or is presently acid

Flood risk	<3% of the map unit has a moderate to high flood risk
Water logging	50-70% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	30-50% of map unit has a high to extreme phosphorus export risk

Risk categories	**Spearwood wet, swamp Phase**
Wind erosion	<3% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of the map unit has a moderate to high flood risk
Water logging	>70% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	>70% of map unit has a high to extreme phosphorus export risk

Appendix C. 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 contain tree species that are a component of a Threatened Ecological Community and may contain habitat for conservation significant fauna.	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 may contain roosting and breeding habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo.	May be 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: Noting the degraded understory and assumed history of grazing, the area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act.	Not likely to be at variance	No
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: The area proposed to be cleared contains species (*Eucalyptus gomphocephala*) that can indicate a threatened ecological community (Tuart woodlands and forest of the Swan Coastal Plain ecological community) as the species is a key indicator of this community.	May be at variance	Yes *Refer to Section 3.2.2 above.*

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 extent of the mapped vegetation type and the native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not likely to be at variance	No
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, the proposed clearing may have an impact on the environmental values of Lake Preston and Yalgorup National Park.	May be at variance	Yes *Refer to Section 3.2.3, above.*
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 a number of water courses and wetlands are recorded within and adjacent to the application area, the proposed clearing is likely to impact on- or off-site hydrology and water quality	May be at variance	Yes *Refer to Section 3.2.4, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soil types are highly susceptible to wind erosion. Noting the extent of the application, the proposed clearing may likely to have an appreciable impact on land degradation.	May be at variance	Yes *(Refer to Section 3.2.4, above.*
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: Given the presence of drains and wetlands recorded adjacent to the application area, the proposed clearing may impact surface or ground water quality.	May be at variance	Yes *Refer to Section 3.2.4, above.*
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. Given the number of water courses and wetland are recorded surrounding the application area, and the risk of waterlogging associated with Spearwood wet, swamp Phase, the proposed clearing may contribute to waterlogging.	May be at variance	Yes *Refer to Section 3.2.4, above.*

Appendix D. 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.
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 E. Photographs of the vegetation

The following information was provided by the applicant.

Notes:

a) *Calotropis procera* (Apple of Sodom) has been included to assist with identifying that this is a weed rather than a native species present
b) Generally, species outside the proposed clearing area have not been included in the description of species.

Table 1: Photo details

Photo number	Dec. Degs Micro		Dec Mins		Pit Area	General Description of species
	S	E	S	E		
1	33.000531	115.707242	3300.0319	11542.4345	C	*Agonis flexuosa*
2	33.000107	115.708417	3300.0064	11542.5050	C	*Agonis flexuosa*
3	32.994033	115.699544	3259.6421	11541.9728	A	*Agonis flexuosa, Eucalyptus gomphocephala, Melaleuca rhaphiophylla*
4	32.994826	115.701650	3259.6896	11542.0990	A	*Eucalyptus gomphocephala, Melaleuca rhaphiophylla, Juncus kraussii* in localized depression. *Calotropis procera**
5	32.993146	115.702003	3259.5888	11542.1202	B	*Melaleuca rhaphiophylla, Juncus kraussii* in low area
6	32.992781	115.703890	3259.5669	11542.2334	B	*Eucalyptus gomphocephala, Melaleuca huegelii*
7	32.992781	115.703890	3259.5669	11542.2334	B	*Eucalyptus gomphocephala, Melaleuca rhaphiophylla, Melaleuca huegelii*
8	32.992351	115.70627	3259.5411	11542.3763	B	*Eucalyptus gomphocephala, Melaleuca huegelii, Melaleuca rhaphiophylla* on edge and outside. *Calotropis procera**
9	32.992351	115.70627	3259.5411	11542.3763	B	*Agonis flexuosa, Eucalyptus gomphocephala,*
10	32.992351	115.70627	3259.5411	11542.3763	B	*Eucalyptus gomphocephala (fallen), Melaleuca rhaphiophylla on edge and outside*
11	32.991046	115.707046	3259.4627	11542.4228	B	*Agonis flexuosa*
12	32.991046	115.707046	3259.4627	11542.4228	B	*Agonis flexuosa, Eucalyptus gomphocephala, Calotropis procera**

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

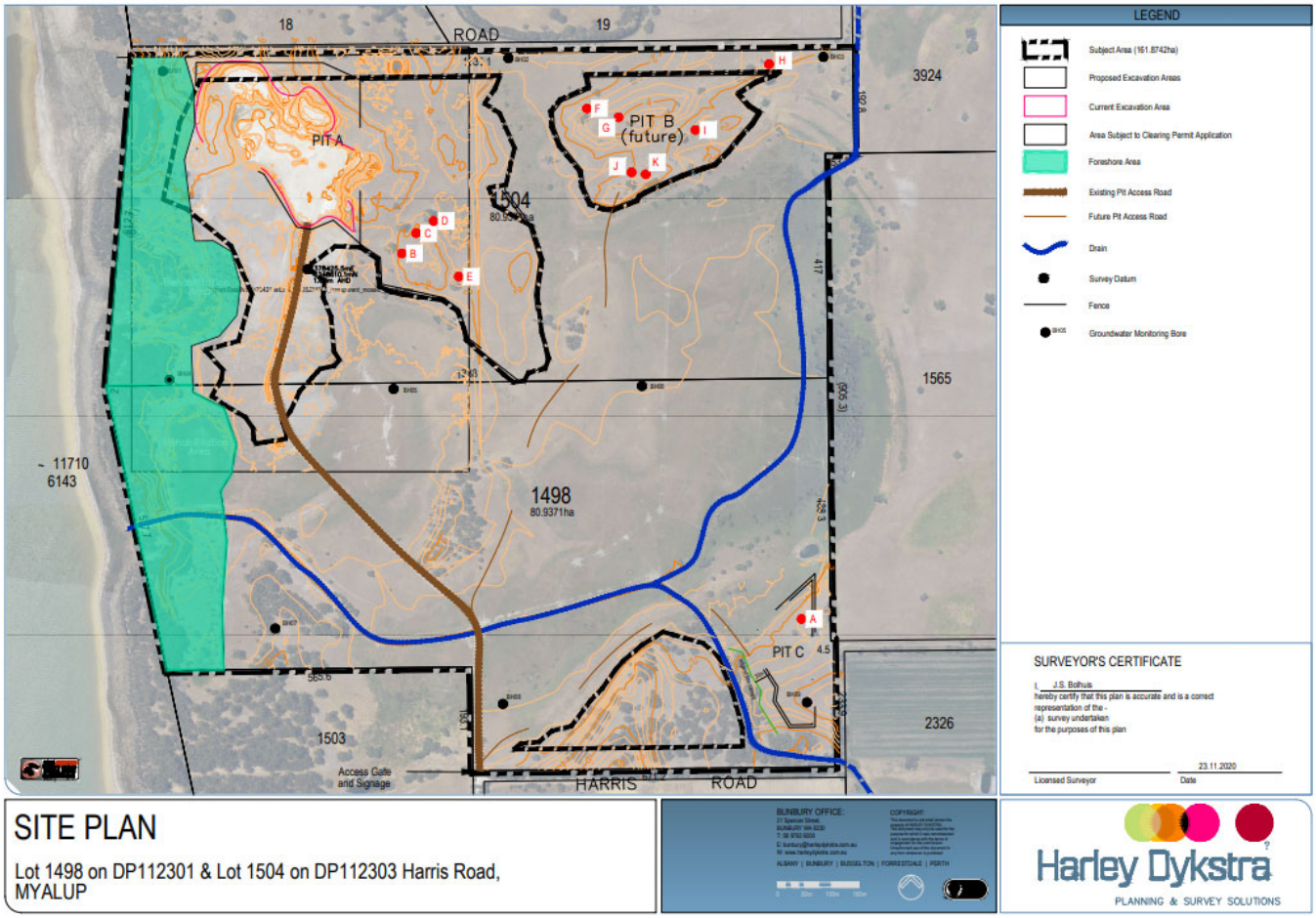
Photo 12

The information below was provided by the applicant in response to DWER's request for information.

Table 2: tree details

Assessment of Tuart trees/Large trees at Lot 1498 Harris Road and Lot 1504 Hazlett Road, Myalup: for CPS9126/1

Photo Point	Pit	Location MGA94-50		Comments	Photo numbers *(see attached sheet of photos)*
		S	E		
A	C	379341.6530	6347960.4270	Dead Eucalypt, 1 small hollow <100mm	1,2
B	A	378600.3576	6348639.5672	*Eucalyptus gomphocephala*, no noticeable hollows.	3-7
C	A	378626.6653	6348677.2708	*Eucalyptus gomphocephala*, no noticeable hollows.	8-11
D	A	378659.1140	6348699.7440	*Eucalyptus gomphocephala*, no noticeable hollows.	12-14
E	A	378705.7580	6348596.4695	*Eucalyptus gomphocephala*, no noticeable hollows.	15-19
F	B	378943.6930	6348908.7290	*Eucalyptus gomphocephala*, no noticeable hollows.	20-22
G	B	379002.2736	6348892.4467	*Eucalyptus gomphocephala*, no noticeable hollows. Side trunks have fallen over.	23-25
H	B	379281.4451	6348991.1960	*Eucalyptus gomphocephala*, possible small hollows,50mm at top on branches 150mm thick.	26-30
I	B	379144.9303	6348868.8560	*Eucalyptus gomphocephala?* Center of trunk is dead. Possible vertical hollow at top of dead trunk.	31-36
J	B	379026.3449	6348790.2127	*Eucalyptus gomphocephala*, no noticeable hollows.	37-40
K	B	379052.6981	6348786.6792	3 x small *Eucalyptus gomphocephala*, no noticeable hollows.	41-40



Photos of mature Eucalyptus at 1498 Harris Rd and 1504 Hazlett Rd, Myalup: CPS9126/1

Photo Point A. 1

Photo Point A.2

Photo Point 8. Photo 3

Photo Point 8. Photo 4

Photo Point B. Photo 5

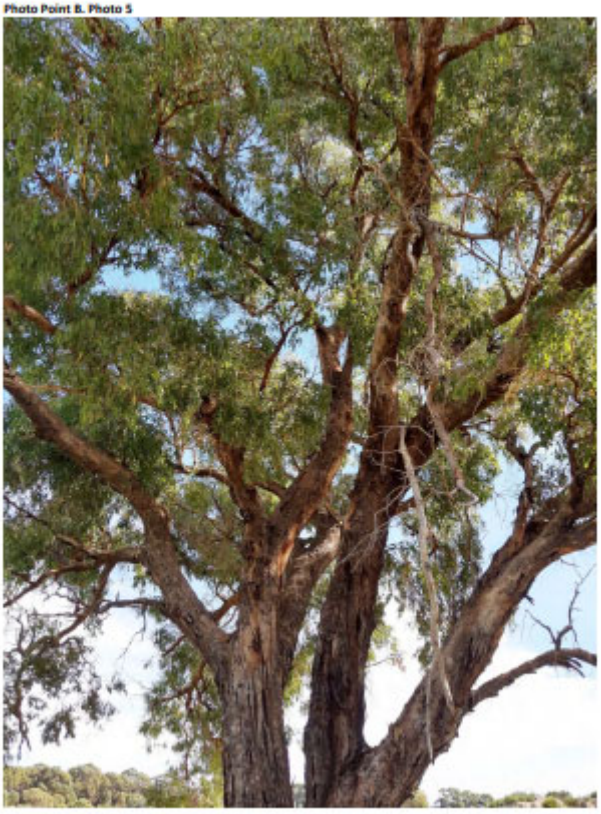


Photo Point B. Photo 6

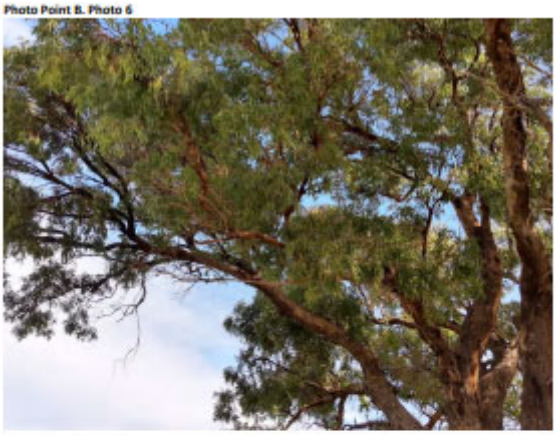


Photo Point B. Photo 7

Photo Point C. Photo 8

Photo Point C. Photo 9

Photo Point C. Photo 10

Photo Point C. Photo 11

Photo Point D. Photo 12

Photo Point D. Photo 13

Photo Point D. Photo 14

Photo Point D. Photo 15

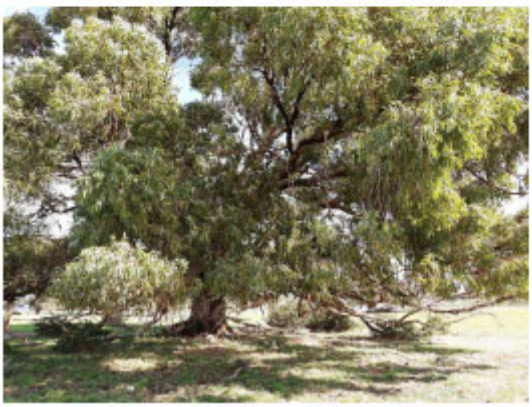


Photo Point E. Photo 16

Photo Point E. Photo 17

Photo Point E. Photo 18

Photo Point E. Photo 19

Photo Point F. Photo 20

Photo Point F. Photo 21

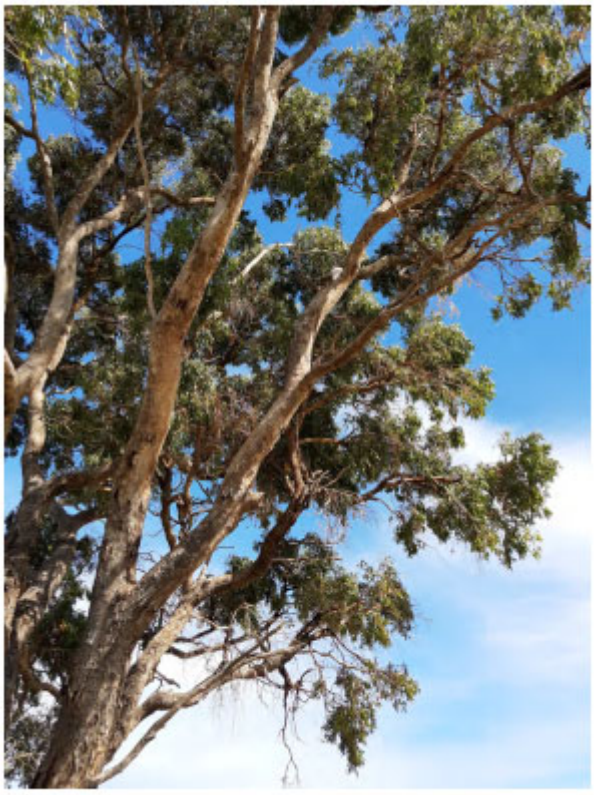


Photo Point F. Photo 22

Photo Point F. Photo 23

Photo Point G. Photo 24

Photo Point G. Photo 25

Photo Point H. Photo 26

Photo Point H. Photo 27

Photo Point H. Photo 28

Photo Point H. Photo 29

Photo Point H. Photo 30

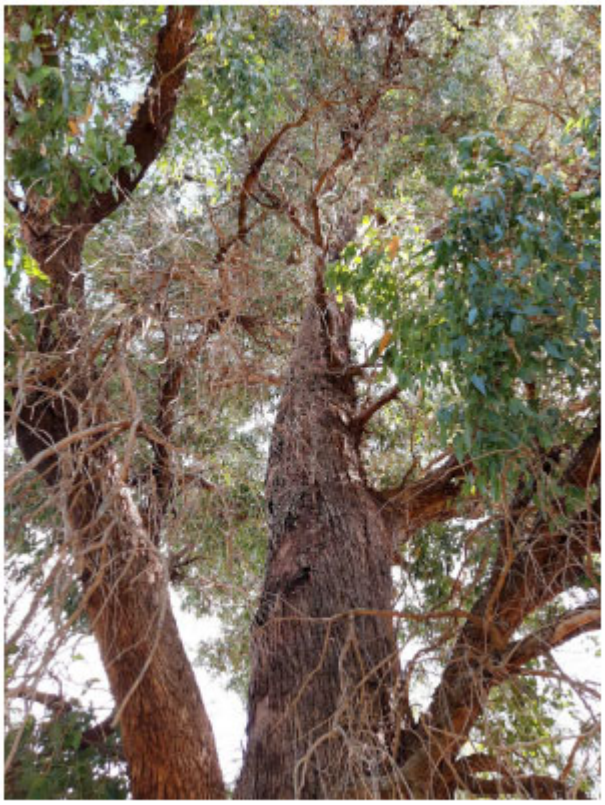


Photo Point I. Photo 31

Photo Point L Photo 32

Photo Point L Photo 33

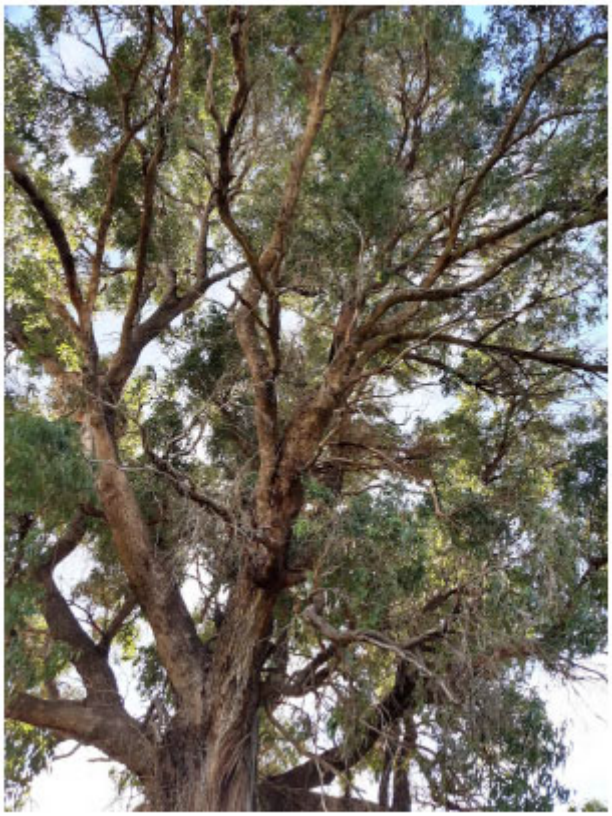


Photo Point I. Photo 34

Photo Point I. Photo 35

Photo Point I. Photo 36

Photo Point J. Photo 37

Photo Point J. Photo 38

Photo Point J. Photo 39

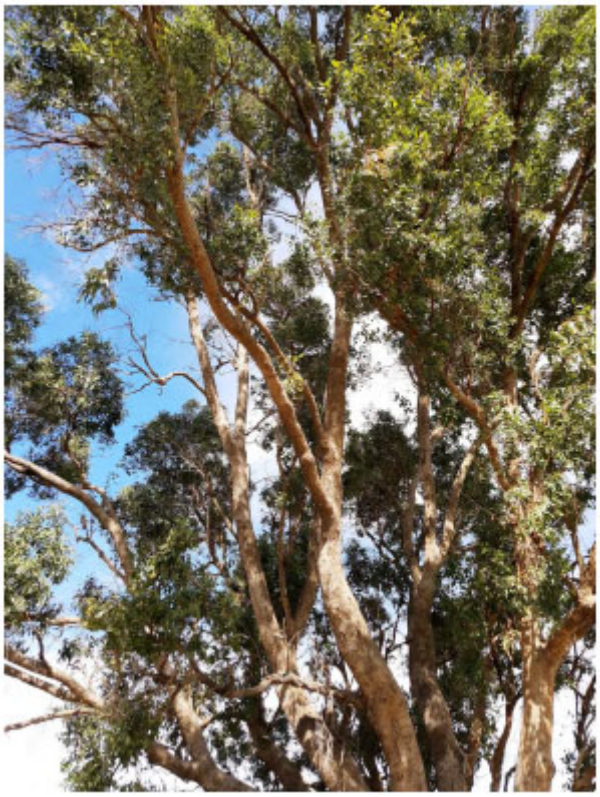


Photo Point J. Photo 40

Photo Point K. Photo 41

Photo Point K. Photo 42

Photo Point K. Photo 43

Photo Point K. Photo 44

Appendix F. Sources of information

F.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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