GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 10565/1

File Number: DWERVT14880

Duration of Permit: From 13/03/2026 to 13/03/2028

PERMIT HOLDER

Alana Starkie

LAND ON WHICH CLEARING IS TO BE DONE

Lot 10910 on Deposited Plan 203844, Middlesex

Lot 2 on Diagram 9652, Middlesex

AUTHORISED ACTIVITY

The permit holder must not clear more than 6.4 hectares of *native vegetation* within the cross-hatched area yellow in Figure 1 of Schedule 1.

CONDITIONS

1. 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.

2. 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.

3. Directional clearing

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

4. Erosion management

The permit holder must commence activities relating to the proposed purpose no later than three (3) months after completion of the authorised clearing activities to reduce the potential for erosion.

5. Offset - Conservation covenant

Prior to 13 March 2027, for the area cross-hatched red in Figure 1 of Schedule 1, within Lot 10910 on Deposited Plan 203844, Middlesex, and Lot 2 on Diagram 9652, Middlesex, the permit holder must give a *conservation covenant*, in accordance with the following requirements:

(a) *native vegetation* in the area cross-hatched red in Figure 1 of Schedule 1 must not be cleared, other than for *clearing* required under the *Bush Fires Act 1954*;

(b) the area cross-hatched red in Figure 1 of Schedule 1 must not be used for the purpose of cultivation of crops or pasture, and must be kept free of livestock;

(c) the *conservation covenant* is to apply in perpetuity and be registered on the title of the property;

(d) the permit holder must, within 6 months of executing the *conservation covenant*, ensure an appropriate fence is erected along the area outlined red in Figure 1 of Schedule 1, which must be designed to prohibit access of livestock and prevent native fauna entanglement;

(e) within one month of executing the *conservation covenant*, the permit holder must provide evidence to the *CEO* that demonstrates the *conservation covenant* has been completed.

6. Fauna management – black cockatoo habitat

(a) Prior to undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder

must engage a *fauna specialist* to 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 6(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 6(a), that tree must only be cleared immediately after the inspection.

(e) Where a *black cockatoo habitat tree* is identified within the combined areas cross-hatched yellow on Figure 1 of Schedule 1 and that tree shows *evidence* of current or past breeding use by *black cockatoo species* under condition 6(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 6(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 6(g) must be installed prior to commencement of the next black cockatoo breeding season following clearing of the related *black cockatoo breeding tree(s)*.

(i) The artificial black cockatoo nest hollow(s) required by condition 6(g) of this permit must:

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

(ii) be designed and placed in accordance with the specifications detailed in Schedule 2; and

(iii) be monitored and maintained in accordance with the specifications detailed in Schedule 2, for a period of at least ten years.

(j) Within two months of clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 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 time(s) and date(s) of inspection(s) by the fauna specialist;

(ii) a description of the fauna specialist inspection methods used;

(iii) the location of any fauna species listed in condition 6(a), if identified, recorded using a GPS unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(iv) the name and number of each fauna species identified;

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

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

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

(viii) the location of the artificial black cockatoo nesting hollow installed;

(a) a description of the *black cockatoo habitat tree(s)* identified, including the:
species of *black cockatoo habitat tree(s)*; and
(b) condition of the *black cockatoo habitat tree(s)*.

(ix) the time and date each black cockatoo habitat tree with evidence of current or past breeding use was cleared; and

(x) the location of the artificial black cockatoo nesting hollow installed.

7. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, 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); and (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 1; and (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 2;

No.	Relevant matter	Specifications
		(g) actions taken in accordance with condition 3; (h) actions taken in accordance with condition 4.
2.	In relation to the offset area pursuant to *condition* 5	(a) evidence that the required area has been fenced in accordance with *condition* 5(d); and (b) evidence demonstrating the *conservation covenant* has been completed in accordance with *condition* 5(e).
3.	In relation to black cockatoo fauna management pursuant to conditions 6	(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*; (d) where the suitable *black cockatoo habitat tree* is determined by the *fauna specialist* to be occupied by *black cockatoo species*:  How to monitor and maintain artificial holl 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) (n) the time and date that the suitable black cockatoo habitat tree was cleared.

8. Reporting

(a) The permit holder must provide to the CEO, on or before 30 June 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 January and 31 December of the preceding 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 30 June 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).

DEFINITIONS

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

Table 2: Definitions

Term	Definition
black cockatoo habitat trees	means trees that have a diameter, measured at 130 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *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).
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.
dieback	means the effect of *Phytophthora* species on native vegetation.
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.
EP Act	*Environmental Protection Act 1986* (WA)
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the *CEO* as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.
fill	means material used to increase the ground level, or to fill a depression.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or

Term	Definition
	(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

Digitally signed by Caitlin Conway
Date: 2026.02.18 15:27:38 +08'00'

Caitlin Conway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20 of the Environmental Protection Act 1986

18 February 2026

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in the map below (

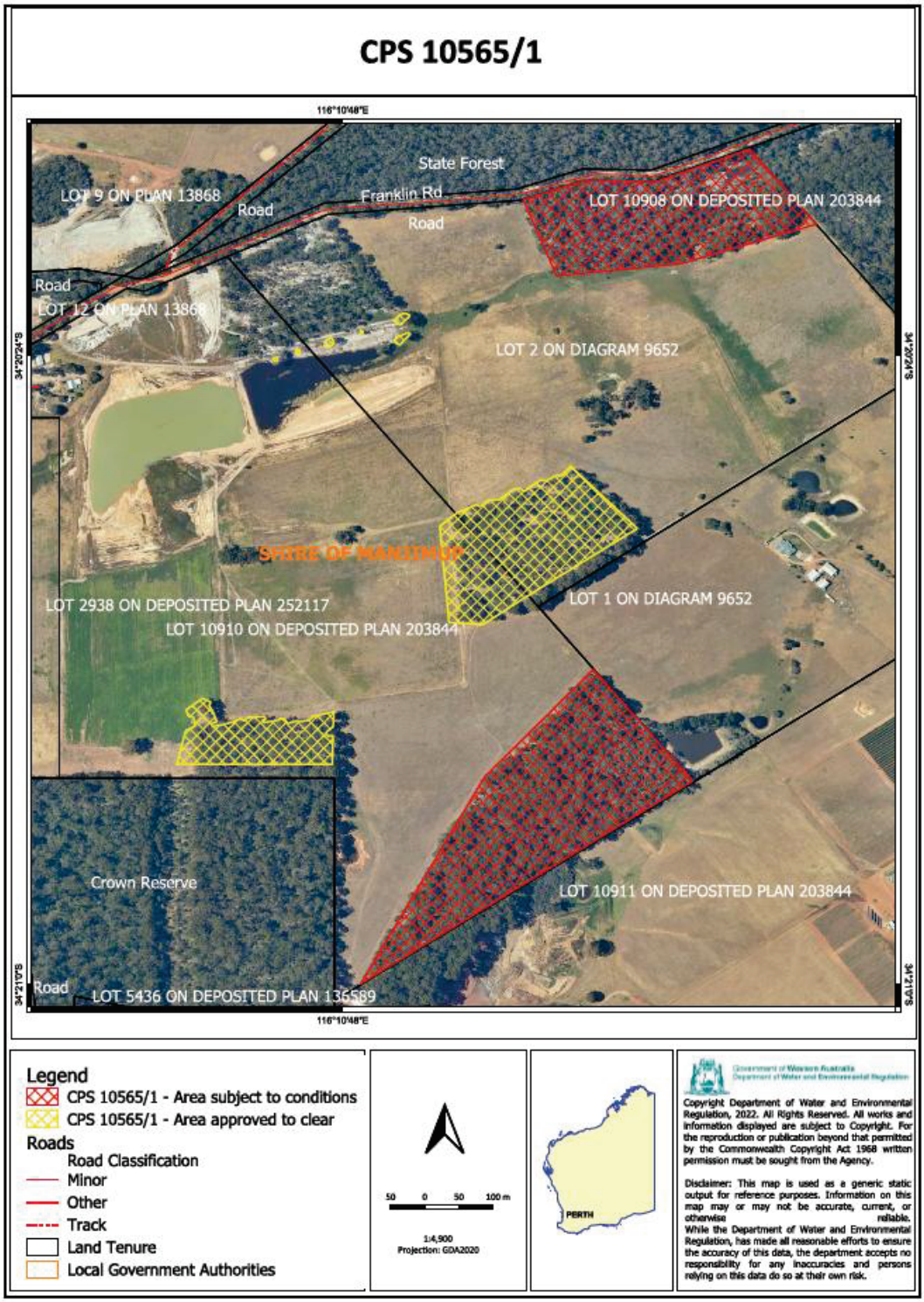


Figure **1**).

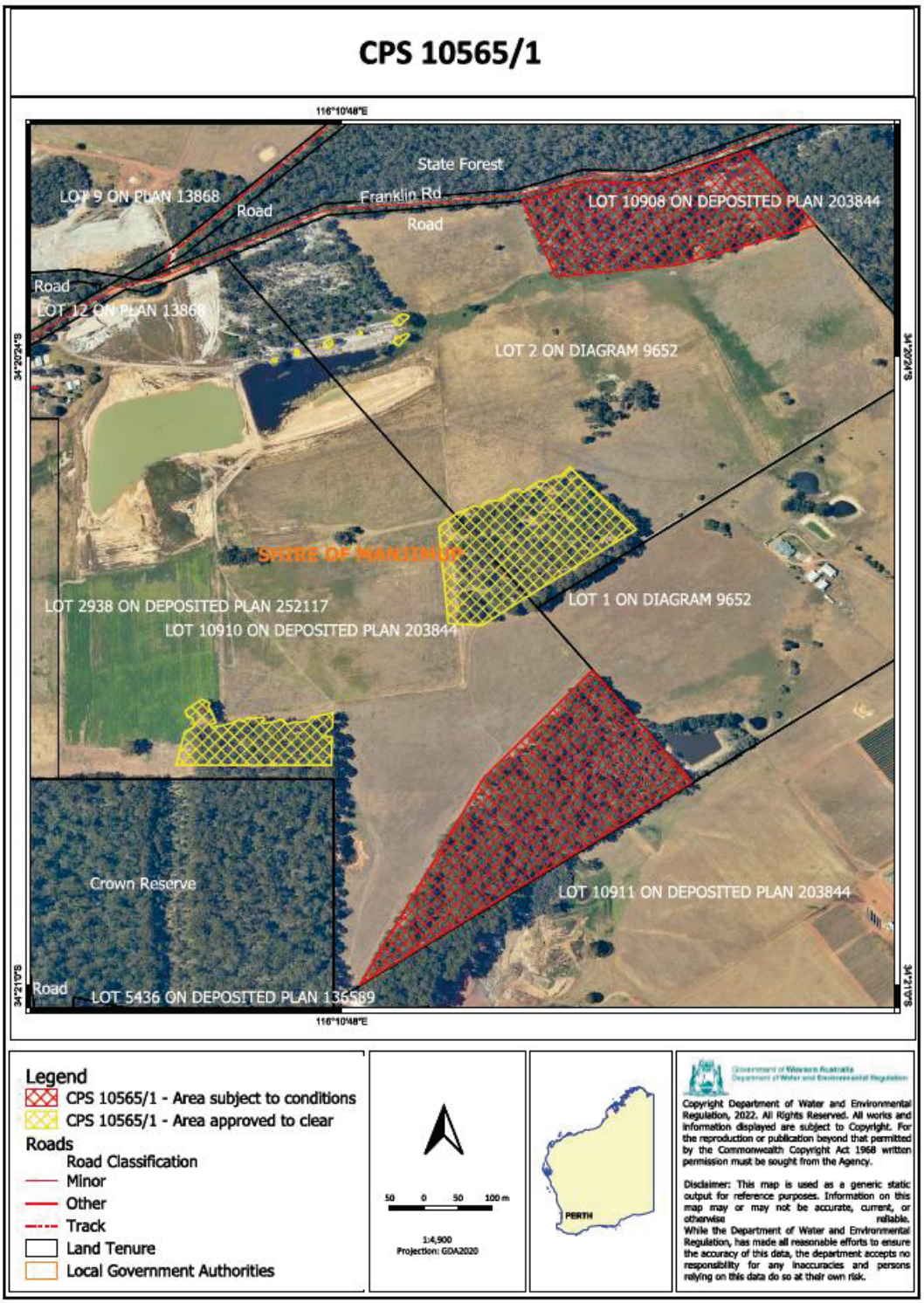


Figure 1: The areas crosshatched yellow indicates the areas authorised to be cleared under the granted clearing permit. The areas cross-hatched red indicate areas within which specific conditions apply.

SCHEDULE 2

Fauna notes - Artificial hollows for Black Cockatoos

Department of Biodiversity, Conservation and Attractions
GOVERNMENT OF WESTERN AUSTRALIA

FAUNA NOTES

Artificial Hollows for Black Cockatoos

There are three species of threatened black cockatoos in the southwest of Western Australia (WA): Baudin's cockatoo *Zanda baudinii* (previously *Calyptorhynchus baudinii*), Carnaby's cockatoo *Zanda latirostris* (previously *Calyptorhynchus latirostris*) and forest red-tailed black cockatoo *Calyptorhynchus banksii naso.* Some of the main threats to the three species include nest hollow shortages due to ongoing and extensive habitat loss and degradation, lack of recruitment of new hollow bearing trees, and competition with galahs, corellas, and feral European honey bees.

Carnaby's cockatoo nestlings in an artificial hollow. Note this chewing post will require replacement following breeding. Photo: Rick Dawson

Artificial hollows can be used to help conserve these threatened black cockatoos by enabling them to breed in areas where natural hollows are limited. This Fauna Note provides advice on how to select an appropriate site, guidelines on how to design and place artificial hollows, and advice on how to maintain and monitor artificial hollows. The information presented here is based on experience with Carnaby's cockatoo which have many examples of successful use of artificial hollows and forest red-tailed black cockatoo which have a few known examples of use. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

Sometimes a site may not be suitable for artificial hollows. This Fauna Note includes options for alternative conservation actions that are important to the conservation of black cockatoos and can also be used to complement the placement of artificial hollows.

It is important to remember that the retention of both old and dead trees (stags) that have suitable hollows for black cockatoos is crucial for breeding, and natural replacement of hollow bearing trees for future breeding is vital for the long-term survival of the species. The installation of artificial hollows should not be used to justify the removal of natural hollow-bearing trees.

When to Use Artificial Hollows

Artificial hollows may be useful at sites where natural hollows are a limiting resource. However, cockatoos may not always use artificial hollows, for example if provided in non-traditional nesting areas. Artificial hollows that are installed within 2 km of current breeding sites are regularly taken up. There are ways to select sites for artificial hollows that will increase the chance that they will be used and that birds will be able to successfully raise chicks.

Where do black cockatoos nest?

Black cockatoos nest in the hollows of mature trees in uncleared or remnant Eucalypt woodland or forest, as well as in remnant paddock trees. Trees may take more than 120 years to develop hollows that are a suitable size, and cockatoos use hollows in both living and dead trees. Refer to the maps at the end of this document for the known breeding range of the three species of black cockatoo.

Carnaby's cockatoos generally breed in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested areas, and Tuart along the Swan Coastal Plain. They are also known to nest in Jarrah, Flooded Gum, York Gum, Gimlet, Powderbark Wandoo, and Karri.

Baudin's cockatoos generally nest in Jarrah, Marri, and Karri in densely forested areas. They are also known to nest in hollows in Wandoo and Tuart.

The breeding habitat for forest red-tailed black cockatoos is in uncleared forest or remnant patches of old Marri. They are also known to nest in Karri, Wandoo, Bullich, Blackbutt, Tuart, and Jarrah.

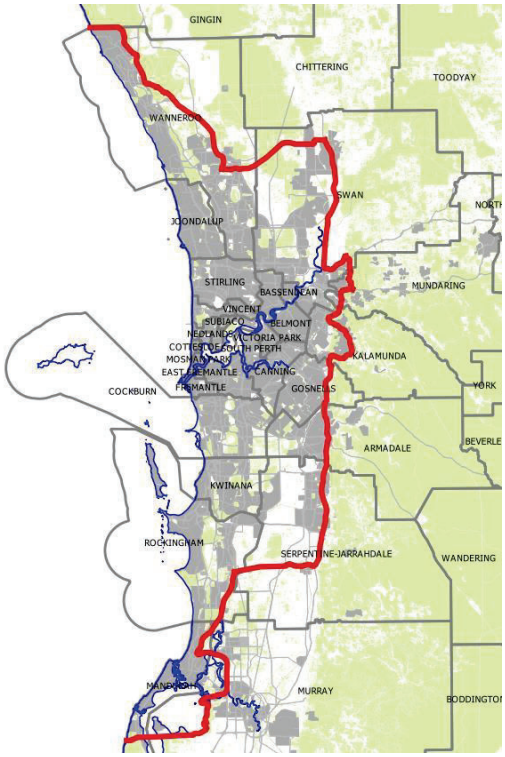
Is my site suitable for artificial hollows?

It is recommended that artificial hollows be used in known nesting areas where there has been a decrease in the availability of natural nesting hollows. Trials have shown that Carnaby's cockatoo and forest red-tailed black cockatoos will nest in artificial hollows if installed in suitable areas and are of a satisfactory design. However, putting up artificial hollows may not be the best way to help black cockatoos in your area.

Indeed, attracting birds to attempt to breed in unsuitable areas may result in increased risk of harm to adult birds or their chicks. The installation of artificial hollows in built up and urbanized areas of the metropolitan Perth and Peel regions, and other urban centres in the southwest is not recommended and should not be undertaken. This is due to the increased risk in this area, including car strike to young inexperienced birds, attack by predators such as Australian ravens and pets, and in highly urbanised and cleared areas there may not be sufficient food resource for the adults to successfully raise chicks).

To decide if your site is suitable for artificial hollows you need to consider five essential criteria (Table 1). If your site does not match all criteria, you may wish to consider alternative conservation actions including:

- protecting habitat by fencing and/or rabbit and stock control to encourage regeneration of native vegetation;
- controlling competitive species such as galahs, corellas and feral bees that may occupy hollows;
- repairing old and damaged natural nesting hollows;
- providing access to fresh water;
- revegetating with preferred food species and nesting trees; and/or
- creating linkages of vegetation between nesting and feeding areas.



Installing artificial hollows in built up areas to the west of the red line above, increases the risk of harm to birds. No artificial hollows should be installed west of this line. (green = remnant vegetation; grey = extent of existing and future urban and industrial development)

Table 1: Essential criteria for a site to be considered suitable for installation of artificial hollows, with alternative conservation actions suggested for each criterion that is not met.

1.	**The site is Eucalypt woodland or forest within the known breeding range of the species**	
	Important consideration	Carnaby's cockatoos tend to nest in Wandoo and Salmon Gum in the Wheatbelt, Marri in forested area and Tuart along the Swan Coastal Plain. Baudin's cockatoos generally nest in Jarrah, Marri, and Karri and forest red-tailed black cockatoos usually nest in Marri.
	Alternative conservation actions	If the site is not within the known current breeding range of black cockatoos, then it is unlikely that the installation of artificial hollows will attract the birds to the site. However, black cockatoos are highly mobile species that also require habitat for feeding and roosting which means that it is important to protect and manage habitat visited by the cockatoos by fencing, and carrying out other management, such as rabbit and stock control, to retain existing habitat, and to encourage regeneration of native vegetation. It is also important to revegetate areas within the breeding and non-breeding areas with preferred food species, and to create linkages of vegetation to assist the movement of the birds through the landscape.
2.	**Breeding by Black cockatoos is known or suspected at the site. There must also be evidence that a lack of suitable available tree hollows is preventing breeding that would otherwise occur in the area.**	

	Important consideration	If the lack of available hollows is due to nest competitors such as galahs, western long-billed corellas or feral bees then any attempt to install artificial hollows must be accompanied by efforts to deter or control these competitors. Alternatively, successful control of competitors may mean that artificial hollows are not needed.
	Alternative conservation actions	If sufficient suitable natural hollows are available in an area, then there is no need to install artificial hollows. This overcomes the need for ongoing maintenance of unnecessary artificial hollows. If breeding is already occurring at the site and there are plenty of available hollows, efforts can be redirected towards caring for existing or future nesting hollows. This may involve repairing old or damaged nesting hollows by covering cracks, removing debris blocking access to hollows or replacing rotted wood in the hollow so that the depth of the nest floor is manageable for the birds. Future hollows can be protected by preventing compaction of ground around trees, fencing and/or rabbit and stock control to encourage regeneration to produce future nesting trees, fire management, and the strategic pruning of limbs to prevent limbs breaking and tearing open hollows. Efforts can also be aimed at enhancing the success of existing breeding by revegetating with preferred food and nesting species, as well as creating linkages of suitable vegetation and fresh water between nesting and feeding areas. If breeding is not occurring at the site despite hollows being available, then there may be a range of factors making the site unsuitable for breeding. These factors must be identified and addressed before breeding can resume in the area (if at all possible). Lack of sufficient food could be the cause, and this can be addressed by revegetating with preferred food species and increasing connectivity in the landscape. To compile a list of plant species suitable for revegetation at your site, refer to the document *Plants Used by Carnaby's Black Cockatoo* available on the Department of Biodiversity, Conservation and Attractions (DBCA) black cockatoo webpage.
3.	**The artificial hollows can be located in close proximity to adequate feeding areas – within a 12 km radius.**	
	Important consideration	Feeding areas commonly contain proteaceous species such as banksias (including dryandras) and hakeas. A list of food plants can be obtained by use of the document *Plants Used by Carnaby's Black Cockatoo*.
	Alternative conservation actions	If the site is not close to adequate food, then the black cockatoos will not be able to successfully raise young. Cockatoos require sufficient food close to nesting areas in order to be able to forage during the day and return to feed nestlings. Existing feeding habitat close (within 12km) to breeding areas can be protected by fencing and/or undertaking rabbit and stock control to encourage regeneration of native vegetation. The amount of feeding habitat in an area can be increased by planting or revegetating with preferred food species.
4.	**The hollows are placed in secure locations and the owner/manager of these areas is supportive and willing to provide the necessary long-term security and annual maintenance for the entire time that the artificial hollow will be in place.**	
	Important consideration	For advice on the monitoring and maintenance requirements, please refer to the section on how to monitor and maintain artificial hollows.
	Alternative conservation actions	Artificial hollows can be subject to nest robbing and vandalism. It is highly recommended that artificial hollows are not put in exposed or easily accessible areas such as road verges unless they are above 8m and placed on the side of trees away from roads. If the site is considered at high risk of nest robbing or vandalism then alternative actions to assist the conservation of the species are recommended including: revegetation, fencing, repairing old or damaged natural nesting hollows and planting vegetation linkages to connect nesting and feeding areas.
5.	**A suitable artificial hollow design is used.**	
	Important consideration	For greatest chance of success, please refer to the sections below on how to design and place artificial hollows.
	Alternative conservation actions	If an alternative design is proposed, it is recommended that Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or WA Museum are contacted to discuss and approve design.

How to Design and Place Artificial Hollows

A wide variety of artificial hollow designs have been previously used with mixed success. Evidence suggests that, while artificial hollows 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.

Successful artificial hollows have been constructed from sections of salvaged natural hollows, or black and white industrial pipe. Research results show that the most effective artificial hollows are made of plastic culvert pipe which is readily available, durable, light, cheap, and easy to install and maintain (see right picture below). When using non-natural materials care must be taken to ensure there are no toxic residues, and that the materials are safe to ingest.

Below are three examples of successful artificial hollows that have been used by black cockatoos for nesting:

- natural log with cut side entrance (left);
- white industrial pipe with top entrance (centre); and
- DBCA recommended polypropylene pipe design (right)



Photo: Christine Groom (left), Rick Dawson (centre and right)

The notes below provides general guidance on design and construction of artificial hollows for black cockatoos. Additional specifications are provided at the end of this Fauna Note which outline current best practice and may be considered recommendations for minimum requirements.

Walls, size, base, and entrance design

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

- durable enough to withstand exposure to elements for at least 20 years; and
- able to simulate the thermal properties of a natural tree hollow.

Artificial hollows should be:

- not less than 375 mm in internal diameter; and
- preferably 1200 mm deep overall with 200 mm of substrate/nesting material covering the base.

The base of the artificial hollow must be:

- securely fixed to the walls and able to support the weight of an adult and nestling(s);
- durable enough to last the life of the nest, and survive chewing by cockatoos;
- free draining;

- at least 375 mm in diameter; and
- covered with 200 mm of sterile, dry, free draining substrate/nesting 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 hard plastic, thick hardwood timber slab or marine ply (not chipboard or MDF). The base material must be cut to fit internally with sharp or rough edges ground away or curled inwards, be fixed securely to the walls and have small drainage holes.

The entrance of the artificial hollow:

- must have a diameter of at least 375 mm; and
- preferably be top entry which will minimise use by non-target species.

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

Adding ladders and sacrificial chewing posts

For artificial hollows made of non-natural materials, or of processed boards, it is necessary to provide a ladder to enable the birds access to the hollow, and sacrificial chewing posts so that birds can chew material, and so that non-target species can exit the hollow. The post can also assist in providing further material to the substrate, however research has shown that not all posts are heavily chewed.

The ladder must be:

- securely mounted to the inside of the hollow;
- made from an open heavy wire mesh with a mesh size of 30 - 50 mm (such as WeldMesh™); or heavy chain; and
- reach to, or below the level of substrate/nesting material.

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.

Do not use material for ladders that the birds can chew, including galvanised metal because the birds may grip or chew the ladder, and ingest harmful compounds.

The sacrificial chewing posts must be:

- made of untreated hardwood such as Jarrah, Marri or Wandoo;
- thick enough to satisfy the birds' needs between maintenance visits;
- extended beyond the top of the hollow as an aid to see whether the nest is being used and reach to the floor of the hollow;
- placed on the inside of the hollow; and
- attached in such a way that they are easy to replace (e.g. a 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 one chewing post is provided. Posts 70 x 50 mm have been used but require monitoring at least every second breeding season when the nest is active and replacing when found to be no longer reaching the nesting material or otherwise significantly chewed. Birds do vary in their chewing habits, and therefore the frequency at which the chewing posts require replacement will also vary.

Mounting and placement

It is important that artificial hollows are placed where they will be accessible for future monitoring and maintenance, but preferably not conspicuous to the general public.

The height at which artificial hollows should be placed is variable, between 4 - 8m for Carnaby's cockatoo, and the average height of natural hollows in dominant tree species in the area is a good guide. If located in an area that the general public cannot access, such as a private property, the hollows can be placed as low as 4 m from the ground so that they are easily accessible by ladder. If located in an area where the general public are allowed access, hollows should be placed at least 8 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.

Black cockatoos 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; and
- fitted on the side where the most shade can be obtained.

Artificial hollows must be mounted such that:

- the fixings used will last the duration of the nest e.g. galvanized bracket or chain and fixed with galvanized coach screws;
- it is secured by more than one anchor for security and stability;
- it is positioned vertically or near vertically; and
- where possible living trees are to be used to provide shade.

Artificial hollows should not be placed in the open on poles, as this may result in excessive exposure to sun during very hot weather.

Safety

Care needs to be taken when placing artificial hollows to ensure human safety is paramount.

Monitoring and Maintaining Artificial Hollows

It is important to monitor and maintain artificial hollows after they have been erected to ensure their effectiveness and so that problems with pest species or maintenance requirements can be identified and resolved. This will ensure the artificial hollow continues to provide opportunities to be used and that birds will be able to successfully raise chicks

Without regular maintenance, artificial hollows are likely to fail to achieve their objective to provide safe nesting opportunities for threatened black cockatoos. Therefore, it is important to continue a regime of regular maintenance for however long the artificial hollow is required. It may be several (to many) decades until a natural replacement hollow is available. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval.

How do I monitor artificial hollows?

Before undertaking monitoring of artificial hollows for black cockatoos, it is recommended that you seek advice from the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum. It is also important to contact the Department's Wildlife Licensing Section, to determine if a lawful authority required (https://www.dbca.wa.gov.au/licences-permits).

Monitoring artificial hollows requires keen observation, and naturalist skills. It is often not possible to observe direct evidence of breeding (i.e. nestlings or eggs) and therefore inferences must be made based on other observations. It is also important to limit disturbance to breeding birds. There are many techniques available to monitor artificial hollows, and a combination of several is likely to achieve the best results (***Table 2***).

Monitoring of artificial hollows should consider and record:

- the condition of the tree, hollow fixings and general hollow condition;
- condition and connection of sacrificial chewing posts, ladder and substrate/nesting material inside hollow;
- any use by black cockatoos and nature of activity (adult birds, chewing, eggs, chicks etc.)
- details of use by non-target species (native or pest);
- identify any problems with pest species or maintenance requirements; and
- maintenance actions undertaken to resolve any problems.

The information collected from monitoring should be written down and reported. There are standard fauna report forms available on the Department's website (https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals) that can be used to record the details of your sighting. Alternatively, if you are

frequently monitoring a larger number of artificial hollows, you can put the details into a spreadsheet or use the black cockatoo monitoring forms available on the DBCA website. Records should be submitted to the Department by emailing fauna.data@dbca.wa.gov.au. The Department will put the records into the Threatened and Priority Fauna Database, and it will be used to inform conservation and management decisions. Any other opportunistic sightings of Threatened and Priority species can also be reported via the same email.

Table 2: Techniques for monitoring artificial hollows

<table>
<tr><th>Technique</th><th>Description of Technique</th></tr>
<tr><td>Looking for signs of use</td><td>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.</td></tr>
<tr><td>Observing parent behaviour around a hollow</td><td>The behaviour of parent birds around a hollow can indicate an approximate age of young in the nest.
<table>
<tr><th>Parent Behaviour</th><th>Approximate Stage and Age of Young</th></tr>
<tr><td>Prospecting for hollow</td><td>Unborn</td></tr>
<tr><td>Male only seen out of hollow</td><td>Egg or very young nestling (< 3 - 4 weeks)</td></tr>
<tr><td>Both parents seen entering/exiting the hollow</td><td>Nestling(s) has hatched (> 3 - 4 weeks)</td></tr>
</table></td></tr>
<tr><td>Observing feeding flocks</td><td>Flocks of all male birds can indicate that 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).</td></tr>
<tr><td>Tapping to flush female</td><td>When females are sitting on eggs they will usually respond to tapping or scraping at the base of their tree by appearing at the entrance or flying from the hollow opening. This is not a guarantee of breeding activity, but an indication that breeding is possibly occurring in the hollow.
Tapping or scraping is best undertaken between 10 am - 3 pm when females will most likely to be sitting.</td></tr>
<tr><td>Observing insect activity around a nest</td><td>Faecal matter produced by nestlings attracts insects, especially flies and ants. The type and number of these insects will help to 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 the entrance of a nest usually indicate that a death has occurred.</td></tr>
<tr><td>Listening for nestling</td><td>With experience it is possible to determine if nestlings are present, and a broad estimate of age based on the type and volume of noises they make.</td></tr>
<tr><td>Looking inside a nest</td><td>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 organize. Also keep in mind that it is important to limit disturbance to breeding birds. 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 to reach nests to undertake observations.</td></tr>
</table>

When do 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, frequency, and timing of monitoring (Table 3).

Breeding by the three southwest black cockatoos varies, and the timing of monitoring of artificial hollows should accommodate the breeding of the likely target species. The Commonwealth Department of Climate Change, Energy,

the Environment and Water (DCCEEW) Species Profile and Threats Database (SPRAT) database records the breeding periods of each of the species as:

- Carnaby's cockatoo - July to November (with peak between August to September)
- Baudin's cockatoo - October to January
- Forest red-tailed black cockatoo - every month, with peaks in April to June and August to October

The age of Carnaby's cockatoo nestlings can be determined by using the following publication:

Saunders, D. A., Dawson, R. and Nicholls, A. O. (2015). Aging nestling Carnaby's cockatoo, *Calyptorhynchus latirostris,* and estimating the timing and length of the breeding season. *Nature Conservation* **12:** 27-42 http://dx.doi.org/10.3897/natureconservation.12.4863

This document provides a series of photographs to illustrate changes in size and plumage of nestlings over the 10–11 weeks of the nestling period which can be used to estimate the approximate age of Carnaby's cockatoo nestlings, up to about nine weeks, by comparing appearance with the nestlings illustrated in the photographs.

Any monitoring that involving disturbance or handling of black cockatoos, requires lawful authority (https://www.dbca.wa.gov.au/licences-permits). Such activity requires specialist skills and authorisation under the *Biodiversity Conservation Act 2016*.

Table 3: Recommended frequency for monitoring artificial hollows, as determined by the aim of the monitoring

Monitoring Aim	Frequency of Visits	Monitoring Techniques
To determine possible use by black cockatoos	At least once during peak breeding season.	• Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside nest
To confirm use by black cockatoos	At least two visits during peak breeding season.	• Looking for signs of use (evidence of chewing) • Observing behaviour of adults around a hollow • Tapping or scraping to flush female • Listening for nestlings • Looking inside a nest Observing breeding evidence from at least two of the techniques confirms use by black cockatoos.
To determine nesting success by black cockatoos	Preferably fortnightly visits between July and December. As a minimum, at least 3 visits spread throughout breeding season.	• Observing insect activity around a nest • Listening for nestlings • Looking inside a nest The presence of eggs or nestlings inside a nest will help to determine nesting success.
To determine use by any species	As often as possible.	As a minimum, inspection from the ground: • Looking for signs of use To confirm: • Looking inside a nest
To determine maintenance requirements	At least every two years and preferably annually.	A basic maintenance check can be undertaken from the ground. Looking inside the nest using a telescopic pole with camera or mirror enables inspection of the sacrificial chewing posts and level of substrate/nesting material. A ladder or elevated work platform will be required for a comprehensive check, and to replace sacrificial chewing posts and carry out other maintenance.

How do I maintain artificial hollows?

Natural hollows used by black cockatoos are typically present for many decades and if artificial hollows are expected to provide a similar role, then they will require maintenance to ensure they continue to function as potential nesting locations for black cockatoos for the long term.

In many cases artificial hollows are required as a condition of development to offset loss of natural hollows, in which case State and Commonwealth offset policy expects that the artificial hollows continue to provide that function for the duration of the impact (or alternatively the expected period of time the natural hollow would have persisted, or the life of the environmental approval). As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Artificial hollow base needing repair.
Photo by Christine Groom

Any problems identified during monitoring or maintenance checks should be addressed as soon as possible and will require similar specialist skills and equipment as used in installation. If breeding is currently occurring, maintenance may need to be delayed if it is likely to disturb the parents or nestling. 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. Likely maintenance includes:

- replacement of sacrificial chewing posts (frequently);
- top-up or replacement of nesting substrate to ensure it reaches the ladder and chewing posts (occasionally);
- replacement of nest bases (occasionally);
- repair or replacement of attachment points (infrequently); and/or
- repair of any cracks to wooden hollows (infrequently).

For artificial hollows known to be used, spare chewing posts should be taken into the field when undertaking maintenance checks as these are likely to need replacement.

Artificial hollows are likely to need to be completely replaced after many years, and other circumstances may require the relocation of artificial hollows (e.g. if the tree they are in becomes damaged).

Applying this guidance to forest red-tailed black cockatoo and Baudin's cockatoo

The information presented here is based on experience with Carnaby's cockatoo, for which many examples of successful use of artificial hollows exist, and forest red-tailed black cockatoo for which a few known examples of use exist. However, to date there are no records of Baudin's cockatoo using artificial nest hollows.

A definite reason for this lack of use is not yet known but may relate to the location of artificial hollows installed to date (few or none placed in Baudin's cockatoo breeding sites where breeding is occurring and natural hollows are limiting) or design or installation issues, such as hollows not being installed high enough in tall forest canopy.

Before deciding to install artificial hollows for forest red-tailed black cockatoo or Baudin's cockatoo, it is recommended that you discuss your proposal with, and/or seek advice from, the Department of Biodiversity, Conservation and Attractions, BirdLife Australia, or the WA Museum.

Maps of Black Cockatoo Breeding Range

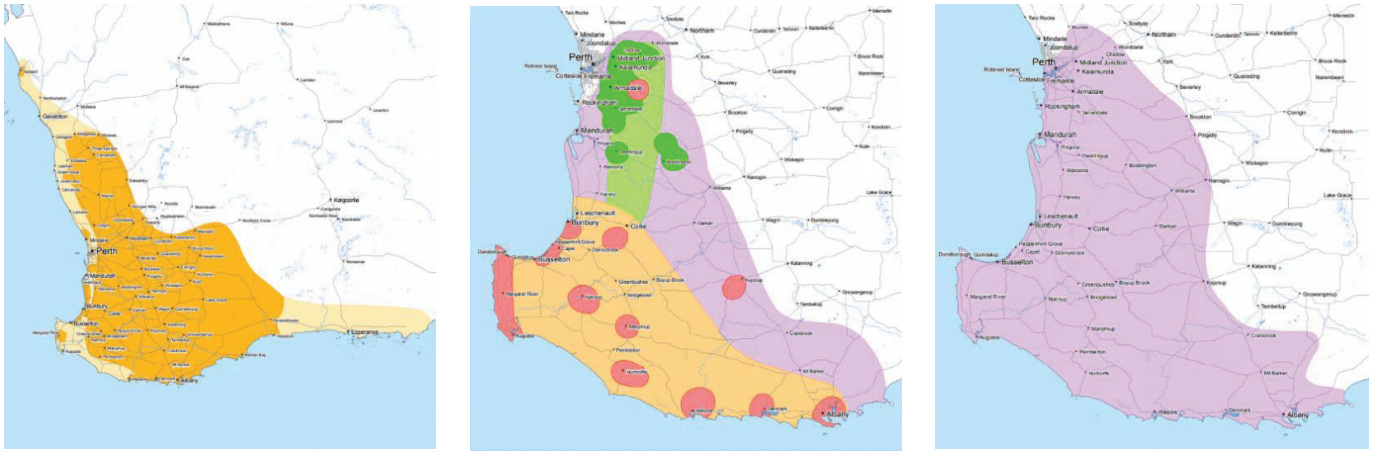


Image: Commonwealth of Australia, 2011

The maps show the modelled distributions of Carnaby's cockatoo (left), Baudin's cockatoo (centre) and forest red-tailed black cockatoo (right). For Baudin's cockatoo, the breeding range is indicated by the red (known breeding areas) and yellow (predicted breeding range), and for Carnaby's cockatoo, the breeding range is indicated by the orange.

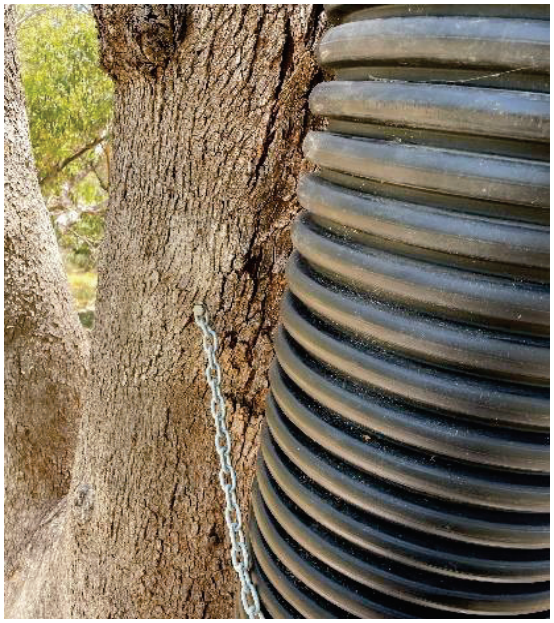
Artificial Hollows – best current design and installation specifications

The specifications below outline the most recent detailed specifications for artificial hollow construction installation and maintenance. These would provide for a well-constructed and installed artificial hollow that is most likely to have an adequate lifespan (minimum 50-years). To ensure longevity, regular maintenance will be required on the nesting material, sacrificial post, and removal of debris from the hollow.

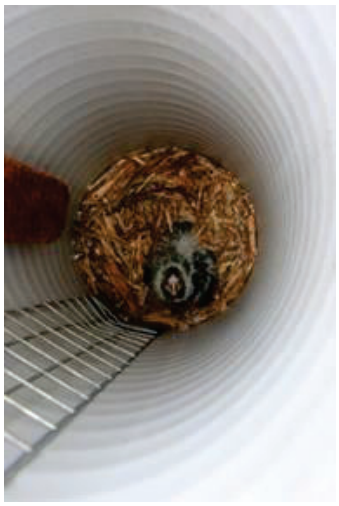
It is highly recommended that any artificial hollows installed as a condition of environmental approval (for example where the artificial hollow is expected to provide benefit for a long period), or installed on DBCA managed lands would meet these specifications as a minimum.

Artificial Hollow Construction Specifications

Dimensions:	internal diameter 375mm (430 mm external), 1200 mm in height, and installed a minimum of 4 m above ground on private property and 8 m on public land.
Pipe material:	Fifty-year UV rated culvert pipe (polypropylene material used with corrugated outer wall and thin inner sleeve. Recommended brand or similar: The 'Vinidex StormPRO' pipes are twin wall, corrugated, polypropylene pipes for non-pressure stormwater and drainage applications, which meet all the requirements for artificial hollows.
Chain:	6 mm galvanised (not zinc plated). The hollows will be attached to the tree by chain and fixed by 4 points.
Fixings:	Galvanised M10 coach screws four x 75 mm. Two on the weight bearing chain at the top and one each side of the hollow.
Ladder:	50 x 50 mm square galvanised weldmesh 4mm thick.
Chewing posts:	Untreated Jarrah, Marri or Wandoo that meet requirements in "Adding ladders and sacrificial chewing posts" above.



Artificial hollow design, the fixing method, and the sacrificial chewing post extending above the hollow rim. Left image shows the side chains that are to be at a 30-degree upwards angle to allow the hollow to move up the tree as the tree grows. Right image shows the top weight bearing fixing which is to be 100 mm above the hollow to allow upwards movement.



Left image shows the internal view, including substrate material placed on the floor to line the hollow, and the internal weld mesh ladder. Substrate material must be course, hard, wood chips at least 200 mm deep.

Centre image shows one hard wood sacrificial post which is to fit and connect to the rim of the hollow by a hook screwed to the post to ensure it does not come loose, block the hollow or injure the occupants.

Right image shows the hard plastic floor which is to be securely fixed with a minimum of 12 small drainage holes. Larger holes may result in the occupants chewing the base.

Monitoring and Maintaining Artificial Hollows

It is important to continue a regime of regular maintenance for however long the artificial hollow is required. Artificial hollows erected as a condition of development to offset the loss of natural hollows may be required to be available and maintained for the life of the development approval. As part of establishing artificial hollows the responsibility and regime for long term monitoring and maintenance should also be established.

Periodic maintenance checks should be undertaken at least every two years, preferably annually, for as long as the artificial hollow is required. Maintenance actions should be completed prior to the breeding season.

Further Reading

DBCA webpage and fauna profiles: Black cockatoos

Department information sheets: Fauna Note – Corellas and other flocking cockatoos

BirdLife Australia webpage and brochure: Identify your Black cockatoo

Western Australian Museum webpage and fact sheets: Cockatoo Care

Saunders DA et al. (2022) Artificial nesting hollows for the conservation of Carnaby's cockatoo *Calyptorhynchus latirostris*: definitely not a case of erect and forget. Pacific Conservation Biology doi:10.1071/PC21061

Acknowledgements

This Fauna Note is a joint initiative of the Department of Biodiversity, Conservation and Attractions, Birdlife Australia, and the Western Australian Museum. Many individuals have contributed to its preparation, including members of the department's Carnaby's cockatoo and forest black cockatoo recovery teams, with significant contributions from Rick Dawson (DBCA Research Associate), Ron Johnstone (WAM), Alan Elliot (Serpentine-Jarrahdale Landcare Centre), and Denis Saunders (CSIRO). This document was prepared by David Mitchell, Geoff Barrett, Kim Williams, Rebecca Bloomfield, Amie Raycraft, Brooke Richards, Teagan Johnston and Martin Dziminski.

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Disclaimer

Last updated: 08 Feb 2023

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 10565/1
Permit type:	Area permit
Applicant name:	Alana Starkie
Application received:	19 March 2024
Application area:	6.4 hectares of native vegetation
Purpose of clearing:	Dam maintenance and pivot irrigation
Method of clearing:	Mechanical
Property:	Lot 10910 on Deposited Plan 203844 Lot 2 on Diagram 9652
Location (LGA area/s):	Shire of Manjimup
Localities (suburb/s):	Middlesex

1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed across multiple separate areas (see Figure 1, Section 1.5). The applicant proposes to clear native vegetation for pivot irrigation and to construct a dam.

The applicant originally applied to clear 7.9 hectares, however the application area was revised to 6.4 hectares during the assessment process in response to the *Country Area Water Supply Act 1947* (CAWS Act) advice.

1.3. Decision on application

Decision:	Granted
Decision date:	18 February 2026
Decision area:	6.4 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 AA), relevant datasets (see Appendix G.1), a site inspection (see Appendix DE), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that applicant has committed to place a conservation covenant over an area of good to excellent condition vegetation within the property as an offset.

The assessment identified that the proposed clearing will result in:

- 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
- potential land degradation in the form of wind erosion.
- Removal of five hectares foraging habitat for black cockatoos
- the potential impact to conservation significant fauna present at the time of clearing

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 2.1), the Delegated Officer determined the proposed clearing is unlikely to lead to long-term adverse impacts on environmental values and can be minimised and managed to unlikely lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures to counterbalance the impacts to environmental values.

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
- staged clearing to minimise wind erosion
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- undertake black cockatoo (BC) inspections prior to clearing and carry out actions to avoid impacts to BC species should they be present within the proposed clearing area
- provide an offset for black cockatoo foraging habitat, by placing a conservation covenant over a 14-hectare area of the property.

1.5. Site map

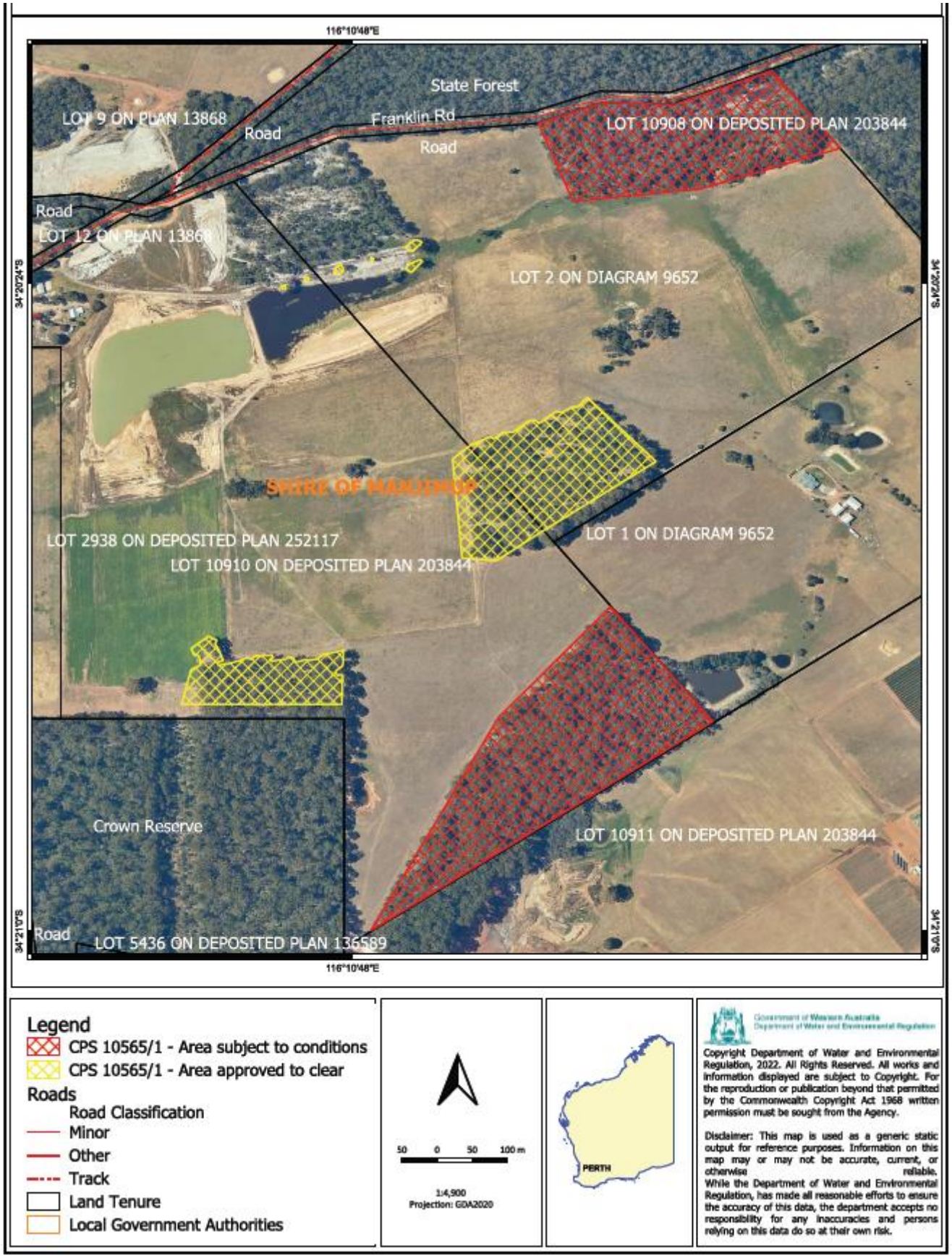

Figure 1. Map of the application area. The areas crosshatched yellow indicates the areas authorised to be cleared under the granted clearing permit. The areas cross-hatched red indicate areas within which specific conditions apply.

2 Legislative context

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

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

- the precautionary principle
- the principle of intergenerational equity
- the principle of polluter pays
- 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)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

In order to reduce the impacts from the proposed action, the applicant has proposed the following management measures (Accendo, 2024):

Fauna Management

- Peg/flag areas to be cleared to avoid any unnecessary disturbance to adjacent vegetation;
- Restrict all vehicles use to designated roads and access tracks;
- Enforce compliance with onsite speed limits at all times;
- During clearing, a qualified fauna expert will be present to direct clearing operators, particularly when clearing trees that are occupied by fauna, to ensure that these are cleared in a way that allows the animals to safely mobilise to adjacent areas. In addition, they will supervise any animal handling and the rescue of injured animals should this be required;
- 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 ; and
- Inspect each black cockatoo habitat tree for evidence of current or past breeding use by black cockatoos and if active black cockatoo nests are located in the clearing footprint, do not clear until fledglings have left the nest.
- 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 prior to commencement of the next black cockatoo breeding season following clearing of the related black cockatoo breeding tree(s)

Weed and Pathogen Management

- All earthmoving and ground engaging equipment will be inspected and cleaned of vegetation, mud and soil prior to entry and exit of the impact area.

Vegetation Retention

- Applicant has proposed to conserve two areas of native vegetation (refer to Section 4) comprising of:

  - Northern retention area - Vegetation consists largely of marri/jarrah with little to no karri, although there is a small wetland area in north-eastern corner, overall, the vegetation is in Very Good to Excellent condition
  - Southern retention area - Vegetation consists of jarrah/marri with scattered karri, in Degraded condition at edges to Very Good in the centre
- A conservation covenant will be placed over these areas to ensure conservation in perpetuity (refer to Section 4 for further details).

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 AA) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see **Error! Reference source not found.** B) identified that the impacts of the proposed clearing present a risk to biological values (fauna). 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 Principles (a) & (b)

Assessment

Noting the site characteristics (see Appendix C), the findings of a tree survey and habitat assessment (Natural Area, 2025), and the habitat preferences of the conservation significant fauna species recorded in the local area (10-kilometre radius), the application area is considered to contain suitable habitat for the following fauna species:

- Zanda baudinii (Baudin's cockatoo) (Endangered)
- *Zanda latirostris* (Carnaby's cockatoo) (Endangered)
- Calyptorhynchus banksii naso (forest red-tailed black cockatoo) (Vulnerable)
- Pseudocheirus occidentalis (western ringtail possum, ngwayir) (Critically endangered)
- Tyto novaehollandiae novaehollandiae (masked owl (southwest)) (Priority 3)
- Falsistrellus mackenziei (western false pipistrelle, western falsistrelle) (Priority 4)
- Hydromys chrysogaster (water-rat, rakali) (Priority 4)
- Isoodon fusciventer (quenda, southwestern brown bandicoot) (Priority 4)
- Phascogale tapoatafa wambenger (south-western brush-tailed phascogale, wambenger) (Conservation dependent)
- Falco peregrinus (peregrine falcon) (Other specially protected)

Black cockatoos

For the purposes of this report, the term black cockatoo is in reference to Baudin's cockatoo (*Zanda baudinii*), Carnaby's cockatoo (*Zanda latirostris*) and the forest red-tailed black cockatoo (*Calyptorhynchus banksii naso).* According to available databases, the application area lies within the mapped distribution of (all three types of) black cockatoos. There are two BC roosting records within the 12-kilometre radius with the closest being 11.27 kilometres from the application area. No breeding sites have been recorded within the 12 kilometres of the application area.

Carnaby's cockatoo feeds on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (Banksia, Hakea and Grevillea), as well as Allocasuarina and Eucalyptus species, Corymbia calophylla (marri) and a range of introduced species (Valentine and Stock, 2008). Forest red-tailed black cockatoo forages within jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies. The species largely feeds on seeds of marri and jarrah, as well as other Eucalyptus species and Allocasuarina cones (DAWE, 2022). Baudin's cockatoos prefer foraging within Eucalypt woodlands and forest, and proteaceous woodland and heath. During the breeding season (October to late January/early February) this species prefers marri seeds.

The scattered marri and jarrah trees within the 4.7 hectare central portion of the application area represent primary foraging and the 0.3 hectares of vegetation comprising of blackbutt (in the northern application area) provides secondary foraging habitat for black cockatoos (DAWE, 2022 and Bancroft and Bamford, 2024). A site inspection by the department in September 2025 recorded foraging evidence from black cockatoos in the central application area (DWER, 2025). There are also multiple minor non-perennial water courses within the local area and several dams

(man-made) near the application area which would provide water sources for foraging black cockatoos. The loss of this foraging habitat is considered to have a signifciant impact upon the conservation status of black cockatoos.

According to the WA Environmental Offsets Calculator and consistent with the WA Environmental offsets policy (2011), the loss of the above mentioned five hectares of black cockatoo foraging habitat will be offset by the applicant's commitment 14 hectares of Very Good to Excellent condition vegetation containing primary foraging habitat within the same property as the proposed clearing area (refer to Section 4 for further details). A significant residual impact will not remain following the above actions.

Suitable breeding habitat for these species includes trees which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. Suitable DBH for nest hollows is 50 centimetres for most tree species, including those present within the application area (DAWE, 2022). The most important breeding trees for forest red-tailed black cockatoos and Baudin's throughout their range are large, mature marri trees (Johnston, Kirkby and Sarti, 2013).

A site inspection (DWER, 2025) found that trees of suitable species and DBH to contain suitable breeding hollows were present within the application area. While no hollows were seen, the site inspection did not employ sufficient methodology to rule out the presence of suitable breeding hollows for black cockatoos. Impacts to clearing of any suitable breeding trees for black cockatoos are considered to be mitigated through a permit condition requiring inspection of the area by a fauna speciailist prior to clearing, and suitable management actions to be taken if any trees containing suitable breeding hollows are required to be cleared, including installation of artificial nesting hollows.

Roosting habitat for black cockatoos is defined as a suitable tree (generally the tallest) or group of tall trees, native or introduced, usually close to an important water source, within an area of quality foraging habitat within the range of each black cockatoo species which provide black cockatoos with shelter during the heat of the day and safe resting places at night (Department of the Environment and Energy, 2017). Individual night roosting sites need suitable foraging habitat and water within six kilometres (EPA, 2019). Overlapping foraging ranges within 12 kilometres also support roosting sites and maintain habitat connectivity and movement across the landscape (EPA, 2019). While the application area is likely to contain suitable trees for black cockatoo roosting, considering the extent of clearing in the context of the local area, impacts of the clearing to black cockatoo roosting habitat are not considered to be significant.

Other fauna

The application area provides potential habitat for western ringtail possum, masked owl western false pipistrelle, western falsistrelle, quenda, south-western brush-tailed phascogale and peregrine falcon. However, noting that the application area is in Completely Degraded condition, with no understorey species, and not managed for pest, it is not likely to be preferred habitat for any of these species. It is considered that these species would only use the vegetation within the application area transiently, if at all, and the clearing is unlikely to have significant impacts on the above species. Furthermore, the applicant's commitment to place a conservation covenant over approximately 14 hectares of better condition native vegetation within the property will conserve better quality habitat for these species in the future. Impacts to fauna individuals present will be managed through a condition to undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity.

Conclusion

Based on the above assessment, the application area contains suitable foraging habitat for black cockatoos, and the proposed clearing would lead to signifciant impacts to black cockatoo foraging habitat. These impacts will be mitigated through an offset conditioned on the permit. Impacts to any black cockatoo breeding habitat will be mitigated through black cockatoo management conditions. There is also the potential that individuals of other conservation significant fauna species may occur within the application area at the time of clearing, however direct impacts can be managed by undertaking slow, progressive, directional clearing.

The applicant may have notification responsibilities under the EPBC Act for impacts to Baudin's black cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo and their habitats, as set out in the EPBC Act. The applicant has been advised to contact the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) to discuss EPBC Act referral requirements.

Conditions

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

- undertake slow, progressive one directional clearing to allow conservation significant fauna to move into adjacent habitat ahead of the clearing activity.
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

- undertake BC inspections prior to clearing and carry out actions to avoid impacts to BC species should they be present within the proposed clearing area
- provide an offset for black cockatoo foraging habitat, by placing a conservation covenant over a 14-hectare area of the property (refer to Section 4 for further details).

3.3. Relevant planning instruments and other matters

The Shire of Manjimup (2024) advised DWER that local government approvals are not required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The application area property is zoned a Priority Agriculture. The Shire did not have any objections to the proposed clearing.

DWER (2024a) has advised that there is no requirement for a water licence for this property under the Rights in Water and Irrigation Act 1914 (RIWI Act).

Following a request for advice regarding clearing of the original 7.9 hectare application area, DWER (2024b) advised that the application area lies within the 1 September 1978 *Country Areas Water Supply Act 1947* (CAWS Act) gazetted Warren River Water Reserve. the proposed clearing is supported if the area to be cleared is reduced accordingly to 6.4 hectares, so it was consistent with the CAWS Act Policy and Guidelines not at variance with the water resource conservation objectives of the CAWS Act.

The Delegated Officer notes that the applicant has reduced the application area to 6.4 hectares to be consistent with the CAWS Act Policy and Guidelines not at variance with the water resource conservation objectives of the CAWS Act.

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that, after the application of the avoidance and mitigation measures summarised in Section 3.1, the loss of five hectares of suitable black cockatoo foraging habitat represents a signifciant residual impact. requiring an offset. The Delegated Officer determined in this instance it was appropriate to consider an offset to counterbalance the significant residual impact given the extent of proposed impact, and the applicants efforts to avoid and minimise the environmental impacts of the proposed clearing, in accordance with the Environmental Offsets Guidelines (2014).

The applicant proposed to place a conservation covenant over two areas of native vegetation comprising of marri/jarrah woodland in Very Good to Excellent condition, comprising approximately 14 hectares (combined) in size (refer to Figure 2). A conservation covenant will be placed over these areas to ensure conservation in perpetuity. Photos of these areas are provided in Appendix D.

In assessing whether the proposed offset is adequately proportionate to the significance of the environmental values impacted, a calculation using the WA Offsets calculator was undertaken. The calculation indicates that the conservation of 14 hectares of native vegetation as an offset is sufficient to adequately address the impacts of the proposed clearing (refer to Appendix F for justification of values used in the calculator). The Delegated Officer considers that this adequately counterbalances the significant residual impacts listed above.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is spread out between two Lots and is surrounded by mostly cleared areas. Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 51 per cent of the original native vegetation cover.
Ecological linkage	The middle match of application area (pivot irrigation area) is mapped within a South west Regional Ecological Linkage (Molloy et. al., 2009).
Conservation areas	No conservation areas are mapped within the application area. However, the southern application area (pivot irrigation area) is approximately 25 metres north of Smith Brook Nature Reserve.
Vegetation description	Photographs supplied by the applicant (Accendo, 2024) and the DWER site inspection (2025) indicate the vegetation within the proposed clearing area vary as follows: • Southern application area consists of *Euclayptus diversicolor* (karri) vegetation, • Central application area (pivot irrigation area) comprises of mostly karri with some marri and jarrah • Northern application area comprises of mainly *Eucalyptus patens* (blackbutt) along the banks of a constructed dam. Representative photos and maps are available in Appendix D and E. This is mostly consistent with the mapped vegetation types: • Crowea, CRy, which is described as 'Tall open forest of *Corymbia calophylla* with mixture of *Eucalyptus marginata* subsp. *marginata* and *Eucalyptus diversicolor* on uplands in hyperhumid and perhumid zones'. • Pemberton, PM1, which is described as 'Tall open forest of *Eucalyptus diversicolor* with mixtures of *Corymbia calophylla* on valley slopes and low forest of *Agonis juniperina-Banksia seminuda-Callistachys lanceolata* on valley floors in the perhumid zone'. The mapped vegetation types retain approximately 64 to72 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Photographs supplied by the applicant and the DWER site inspection indicate the vegetation within the proposed clearing area is in completely degraded condition (Keighery, 1994) condition, described as: • 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. The full Keighery (1994) condition rating scale is provided in Appendix C C. Representative photos are available in Appendix DD and E.
Climate and landform	Two types of landforms are found within the application area:

Characteristic	Details
	• Broad ridge crests- The unit comprises broadly convex ridge crests and the flanks of gentle upper slopes and ridges • Minor valleys (20-40 m dee)) - Landform notes: These valleys are 20 to 40 metres deep and generally have flat or very gently sloping floors. The property has a high point of 209 metre Australian Height Datum (AHD) at the eastern clearing area, descending to 151metre AHD at the western boundary. The dam area is situated in a valley floor within a natural waterway running west-south-west. The property is situated near the 950-millimetre rainfall isohyte
Soil description	The soil is mapped as: • Crowea (Pimelia), yellow duplex Phase, described as Gravelly yellow duplex soils; jarrah-marri forest. • Pemberton Subsystem (Pimelaia) , described as 20 to 40 meter deep. Flat to gently sloping floors. Few channels. 3 to 10 degrees. Smooth slopes. Red or yellow gradational soils, not calcareous with some red duplex soils.
Land degradation risk	Advice was sought from the Commissioner of Soil and Land Conservation (CSLC), who advised that the mapped soils are at risk of wind and water erosion and Phosphorus loss when cleared of vegetation (CLSC, 2024). However the CSLC advised that a full ground cover will reduce the risk, and with good land management, clearing native vegetation is not expected to increase the likelihood of water erosion in this location. Other land degradation risks were considered to be low (CSLC, 2024).
Waterbodies	The desktop assessment and aerial imagery indicated that the northern application area (dam construction area) is in the close vicinity of nonperennial minor river.
Hydrogeography	The proposed clearing site lies within the 1 September 1978 *Country Areas Water Supply Act 1947* (CAWS Act) gazetted Warren River Water Reserve. The application area falls within the Warren River and Tributaries Surface Water Area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).
Flora	There are historic records of two priority flora species, and no records of threatened flora species, within 10 kilometres. Both flora records are not within the same soil and vegetation type as the application area.
Ecological communities	Application area is not mapped within a conservation significant ecological community, and no conservation significant ecological communities are mapped within the local area.
Fauna	There are records of 15 fauna of conservation significance within the local area (10-kilometre radius). There are no black cockatoo breeding or roosting records within the ten-kilometre radius. A site inspection (DWER, 2025) found possible evidence of black cockatoo foraging on marri fruits present in the application area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Jarrah Forest_1144	646.48	230.53	35.66	195.23	30.20
Warren_1144	159,668.36	127,836.26	80.06	118,301.16	74.09
Vegetation complex					
Crowea, Cry **	33,764.55	24,324.31	72.04	22,509.41	66.67
Pemberton, PM1 **	25,801.16	16,661.53	64.58	15,021.45	58.22
Local area					
10km radius	33749.358	17314.339	51.3	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	N	1.30	N
Falco peregrinus (peregrine falcon)	OS	N	N	1.96	N
Falsistrellus mackenziei (western false pipistrelle, western falsistrelle)	P4	N	N	2.06	N
Isoodon fusciventer (quenda, southwestern brown bandicoot)	P4	Y	N	2.51	N
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale, wambenger)	CD	N	N	2.59	N
Pseudocheirus occidentalis (western ringtail possum, ngwayir)	CR	N	N	2.70	N
Tyto novaehollandiae novaehollandiae (masked owl (southwest))	P3	N	N	4.48	N
Zanda baudinii (Baudin's cockatoo)	EN	Y	Y	4.57	N
Zanda latirostris (Carnaby's cockatoo)	EN	Y	Y	4.60	N

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared is unlikely to contain significant flora or assemblages of plants. The application area provides suitable foraging habitat for conservation significant fauna (see Section 3.2.1)	May be at variance	Yes *see Section 3.2.1*
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 application area contains signifciant foraging habitat for black cockatoo species. It may also contain suitable breeding habitat for black cockatoo species. While the application area may provide habitat for other conservation significant fauna species, noting the condition of the vegetation, impacts to other conservation signifciant fauna species are unlikely to be significant.	At variance	Yes *see Section 3.2.1*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Noting the completely degraded condition of vegetation, the historic clearing (grazing) and that no threatened flora species are present within the local area, the area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act or EPBC 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 is unlikely to contain species that can indicate a threatened ecological community.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of 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: Considering that the application area is in Completely Degraded condition, the 25 metre buffer of vegetation that will remain between the southern portion of the application area and the Smith Brook Nature Reserve is considered to be sufficient to prevent significant impacts to this conservation	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
area. Weed and dieback conditions imposed on the permit will further prevent impacts.		
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact riparian vegetation.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: CSLC (2024) advised that soils within the application area are susceptible to water erosion and phosphorus loss, but that these risks can be managed by maintaining a full ground cover. Noting that the end land use and that a condition will be placed on the permit to require that the proposed development is to occur within 3 months of the clearing taking placed, land degradation impacts are unlikely to appreciable .	Not likely to be at variance	No
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 exten of the clearing and distance to water courses and Public Drinking Water Sources Areas are, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding (CSLC, 2024). Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging (CSLC, 2024).	Not likely to be at variance	No

Appendix C. 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 D. Photographs of the vegetation in the retention area and application area

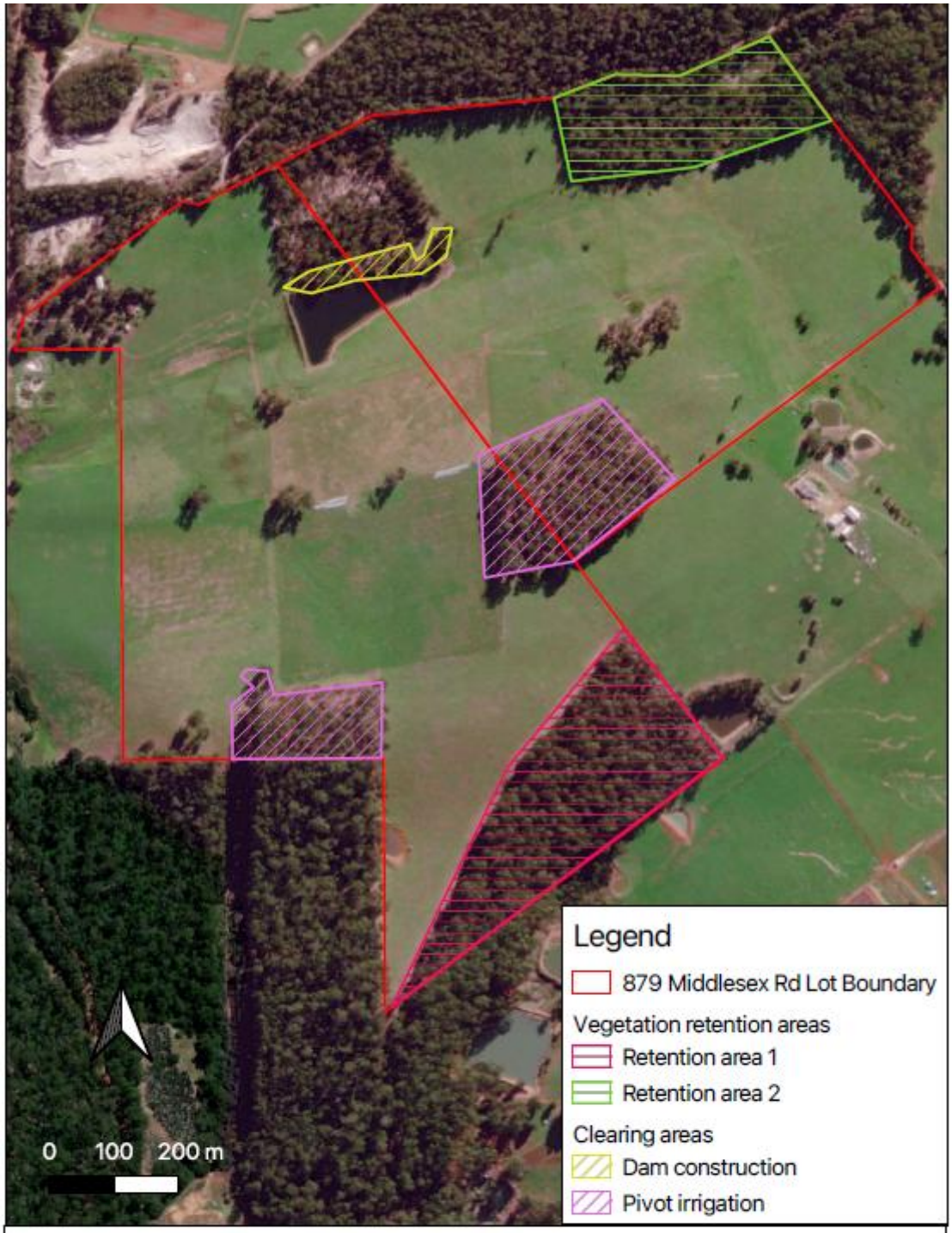

Figure 2: Retention areas and clearing areas (Accendo, 204)

Figure 3: Vegetation condition within retention area 1 and 2 (Accendo, 2024)

Figure 4: Dam construction area comprising of *Eucalyptus patens* (Accendo, 2024)

Figure 5: Pivot irrigation area comprising of *Eucalyptus diversicolor* (Accendo, 2024)

Appendix E. DWER site inspection

DWER site inspection (DWER, 2025) was undertaken in September 2025 to determine the risk of black cockatoo habitat trees being present and to determine the vegetation condition within the application area and retention area.

DWER Officers identified that pivot irrigation area (the central and southern application area) is devoid of understorey and has mostly karri trees with some scattered marri and jarrah in the central application area. Foraging evidence was identified in the central application area. Most karri trees were recorded to be greater than 50 centimetres Diameter at Breast Height (DBH). The trees in the dam area (northern application area) was not accessible due to the depth of paddock pond and adjacent stream however, the trees appeared large. Overall, the vegetation condition is 'Completely degraded ', given understorey is absent, parkland cleared and heavily grazed (DWER, 2025).

DWER also inspected two areas to be placed under a conservation covenant as an offset (northern and southern areas – refer to Figure 2 and Figure 6).

The southern offset area ranged from very good to excellent vegetation is in the west and the condition decreases and you move east. The vegetation is mostly young/juvenile jarrah/marri woodland with isolated karri. The northern offset Area had less edge effects and is mostly very good to excellent condition. The vegetation type changes from a jarrah/marri woodland to a damp/wetland area and pond.

Figure 6: Vegetation within the offset areas (L – northern offset area , R – southern offset area)

Appendix F. Offset calculator value justification

Rationale for scores used in the offsets calculator

Environmental value to be offset			
Calculation	*Score (Area)*		*Rationale*
Conservation significance			
Description	foraging habitat for BCs (all three species)		
Type of environmental value	Species (flora/fauna)		
Conservation significance of environmental value	Rare/threatened species - endangered		Calculations based on Carnaby's - as while both FRT and CBC can forage within central area (with marri) and northern area (blackbutt (according to Bancroft and Bamford)) and Carnabys have the higher conservation status
Landscape-level value impacted	yes/no		
Significant impact			
Description	Forgaing habitat for all three species of black cockatoo		
Significant impact (hectares) / Type of feature	5.00		Central application area 4.7 ha Northern application area contains approx 0.3 ha actual trees Southern application area not considered in this area, as it only contains karri with no understorey
Quality (scale) / Number	3.00		There are two BC roosting records within the 12 kilometre radius with the closest being 11.27 kilometres from the application area. No breeding sites have been recorded within the 12 kilometres of the application area. Central application area comprises of karri trees with very scattered marri and jarrah with evidence of foraging (DWER, 2025). Northern application area contains blackbutt - less preferred foraging species for BC. Southern app area comprises of only karri with no understorey. Overall, karri is present within all 3 areas, but given the lack of understorey species around the karri and that karri is not a primary forgaing spelces itself, karri has not been factored into this quality score. Considering the vegetation condition (parkland cleared with scattered marri jarrah in the central app area and lacking typical karri understosery to be foraged upon), in the context of local area was given a score of 3.
Rehabilitation credit			
Description	0		none provided
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Conservation covenant over two areas on property		
Proposed offset (area in hectares)	14.00		Total of two areas under covenant
Current quality of offset site / Start number (of type of feature)	8.00		Northern portion - Veg consists largely of marri/jarrah with little to no karri, although there is a small wetland area in north-eastern corner, in Very Good to Excellent condition. Southern area - Veg consists of jarrah/marri with scattered karri, in Degraded condition at edges to Very Good in centre
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00		No management actions proposed
Future quality WITH offset (scale) / Future number WITH offset	8.00		Placing a conservation covenant to the area would retain the current vegetation condition and restrict any potential for future development.
Time until ecological benefit (years)	1.00		Given the land is already vegetated, the ecological benefit exists already on site.
Confidence in offset result (%)	0.9		There is a high level of confidence that the offset will reduce the risk of loss of native vegetation cover in the local and regional context.
Duration of offset implementation (maximum 20 years)	20.00		An irrevocable conservation covenant is to be placed on the site, therefore the maximum 20 years was used.
Time until offset site secured (years)	1.00		the administrative process of executing the covenant can be achieved within 1 year.
Risk of future loss WITHOUT offset (%)	20.0%		land zoned priority agriculture
Risk of future loss WITH offset (%)	5.0%		placing a conservation covenant over the proposed offset area will reduce the risk of loss of native vegetation on this property. The risk of catastrophic events (fire, dieback etc.) remain.
Offset ratio (Conservation area only)	N/A		

Appendix G. Sources of information

G.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- 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)
- 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

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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