



## CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

<b>Purpose Permit number:</b>	CPS 9028/1
<b>Permit Holder:</b>	Shire of Murray
<b>Duration of Permit:</b>	11 May 2021 to 11 May 2026

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

### PART I – CLEARING AUTHORISED

#### 1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of road widening and road upgrades.

#### 2. Land on which clearing is to be done

Road Reserve (PIN 1362205), Banksiadale

#### 3. Clearing authorised

The permit holder must not clear more than 0.54 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1, Figure 2 and Figure 3 of attached Schedule 1.

#### 4. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the purpose described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for this purpose under the *Local Government Act 1995* or any other written law.

### PART II – MANAGEMENT CONDITIONS

#### 5. Avoid, minimise and reduce the impacts and extent of clearing

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

- avoid the *clearing* of *native vegetation*;
- minimise the amount of *native vegetation* to be cleared; and
- reduce the impact of *clearing* on any environmental value.

#### 6. Weed and dieback management

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

- clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared;
- restrict the movement of machines and other vehicles to the limits of the areas to be cleared; and
- only move soils in dry conditions.

## 7. Clearing authorised Fauna management – avoidance of black cockatoo habitat trees

The permit holder must not clear known black cockatoo habitat trees in the locations listed in Schedule 2.

### **PART III - RECORD KEEPING AND REPORTING**

## 8. 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 <i>clearing</i> activities generally	<ul style="list-style-type: none"><li>(a) the location where the <i>clearing</i> occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;</li><li>(b) the date that the area was cleared;</li><li>(c) the size of the area cleared (in hectares);</li><li>(d) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with <i>condition 5</i>; and</li><li>(e) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with <i>condition 6</i>.</li></ul>
2.	In relation to fauna management	<ul style="list-style-type: none"><li>(a) actions taken to avoid the clearing of <i>black cockatoo habitat trees</i> in accordance with <i>condition 7</i>.</li></ul>

## 9. Reporting

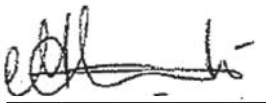
The permit holder must provide to the *CEO* the records required under *condition 8* of this permit when requested by the *CEO*.

## DEFINITIONS

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

**Table 2: Definitions**

Term	Definition
black cockatoo habitat trees	means trees that have a diameter, measured at 150 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for <i>Eucalyptus salmonophloia</i> or <i>Eucalyptus wandoo</i> ) that contain hollows suitable for breeding by black cockatoo species.
CEO	Chief Executive Officer of the <i>department</i> responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i>
clearing	has the meaning given under section 3(1) of the EP Act
condition	a condition to which this clearing permit is subject under section 51H of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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 <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned



Meenu Vitarana  
A/MANAGER  
NATIVE VEGETATION REGULATION

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

16 April 2021

# Schedule 1

Figure 1: Map of the boundaries of the areas within which *clearing* may occur.

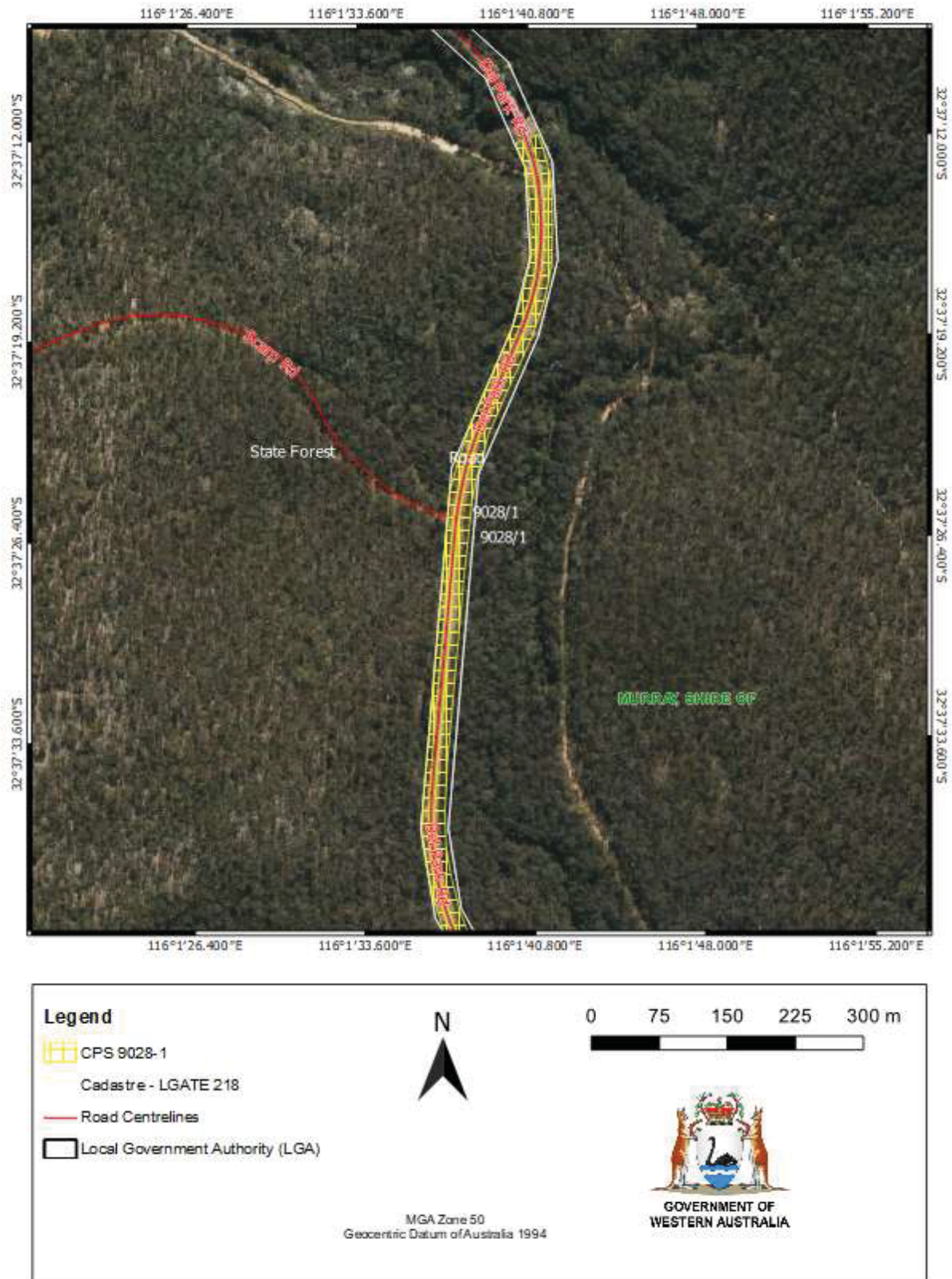


Figure 2: Map of the boundaries of the areas within which *clearing* may occur.

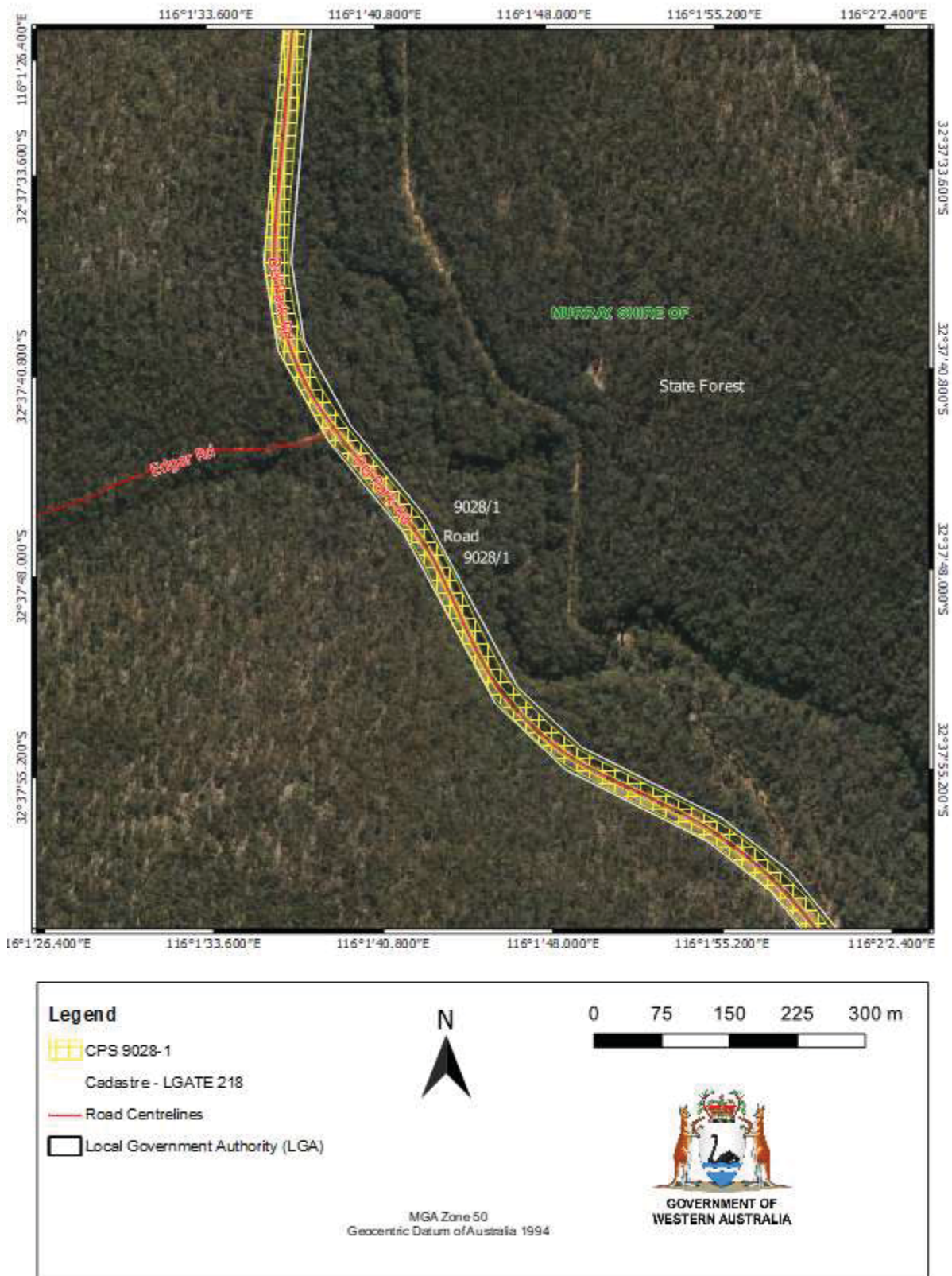
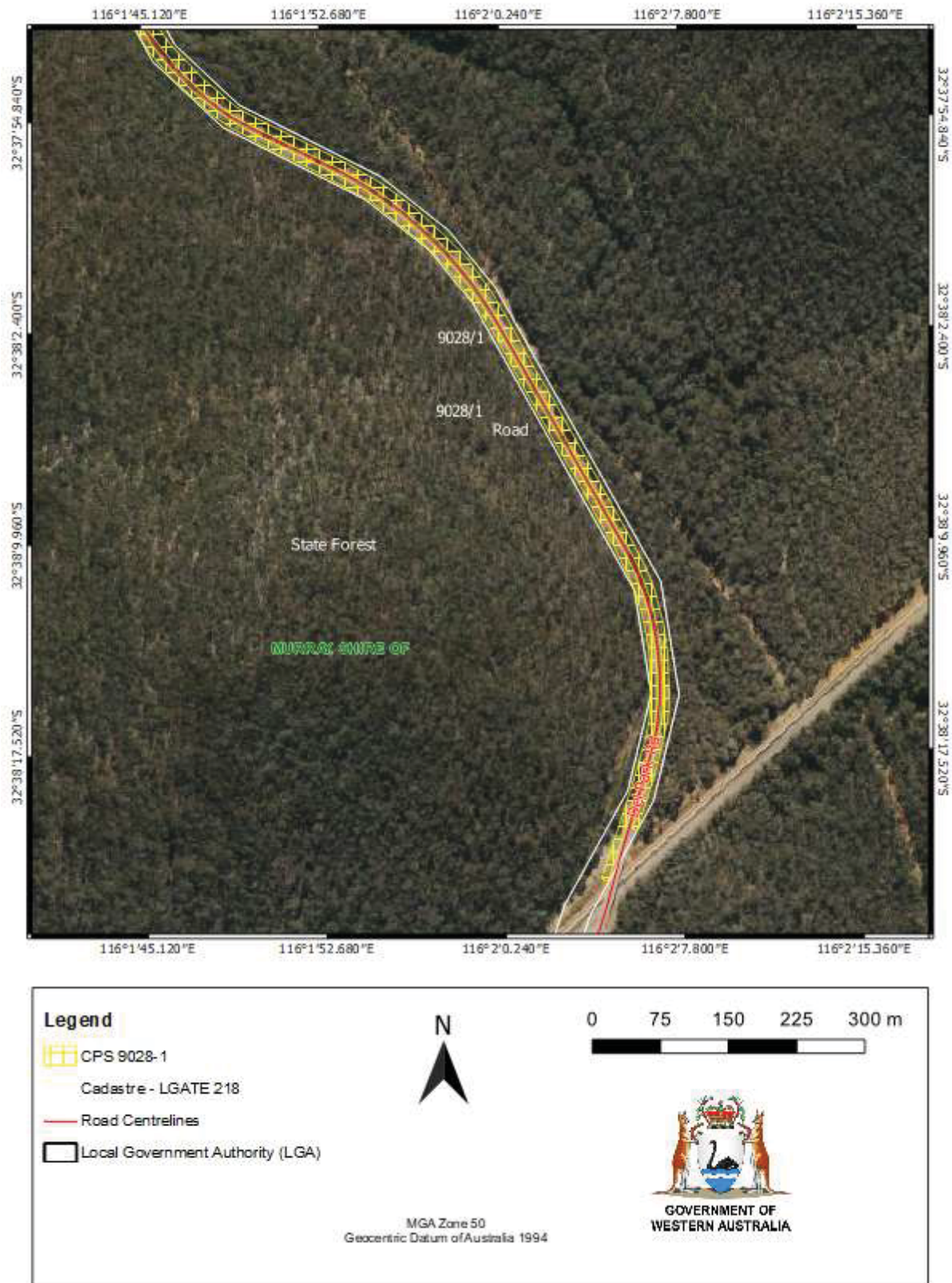


Figure 3: Map of the boundaries of the areas within which *clearing* may occur.



## Schedule 2

### *Location of Black cockatoo habitat trees*

Emerge Associates (Emerge) (2021) Black Cockatoo Habitat Assessment. Del Park Road, Dwellingup. Project No: EP20-146(02) Unpublished report prepared for the Shire of Murray. February 2021. Doc No.: EP20-146(02)--003 TAA/Version: 1

<b>Easting</b>	<b>Northing</b>	<b>Black cockatoo habitat tree (DBH &gt;50cm)</b>	<b>Potential black cockatoo hollow</b>
408770.6594	6389458.687	Black cockatoo habitat tree	-
408720.8261	6389972.666	Black cockatoo habitat tree	-
408493.8299	6388423.884	Black cockatoo habitat tree	-
408957.9073	6389193.204	Black cockatoo habitat tree	-
408957.9073	6389193.204	Black cockatoo habitat tree	-
409493.8299	6388423.884	Black cockatoo habitat tree	-
409516.0036	6388451.027	Black cockatoo habitat tree	-
409516.0036	6388451.027	Black cockatoo habitat tree	-
409379.1246	6388772.081	Black cockatoo habitat tree	-
408859.6653	6389379.676	Black cockatoo habitat tree	-
408817.9079	6390416.588	Black cockatoo habitat tree	-
408859.6653	6389379.676	Black cockatoo habitat tree	-
408817.9079	6390416.588	Black cockatoo habitat tree	-



# Clearing Permit Decision Report

## 1. Application details and outcome

### 1.1. Permit application details

Permit number:	CPS 9028/1
Permit type:	Purpose Permit
Applicant name:	Shire of Murray
Application received:	31 August 2020
Application area:	0.54 hectares of native vegetation
Purpose of clearing:	Road construction and upgrades
Method of clearing:	Mechanical removal
Property:	Road Reserve – 1362205, Banksiadale
Location (LGA area/s):	Shire of Murray
Localities (suburb/s):	Banksiadale

### 1.2. Description of clearing activities

The Shire of Murray propose to widen Del Park Road, Banksiadale, for roadside widening and powerline relocation. Widening up to 2.5 metres will be required in areas on both sides of Del Park Road for approximately 2.4 kilometres. Up to 0.54 hectares of clearing is required within the clearing application area of 3.99 hectares. See Section 1.5, Figure 1.

### 1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	16 April 2021
Decision area:	0.54 hectares of native vegetation on both sides of Del Park Road 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 public comment for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix G2), the findings of black cockatoo habitat assessment (Appendix A), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments, and any other matters considered relevant to the assessment (Section 3.3). The Delegated Officer also took into consideration the purpose of the clearing to relocate overhead powerlines and to reduce roadside hazards to improve public safety.

The assessment identified that the proposed clearing may result in the loss of native vegetation that potentially supports Priority flora taxa and provides foraging habitat value to three Threatened black cockatoo species. The proposed clearing may also result in the introduction and spread of dieback and weeds into adjacent vegetation managed for conservation purposes.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (Section 3.1), the Delegated Officer determined that the applicant has suitably demonstrated avoidance and minimisation measures and that the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

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

- avoid 13 identified black cockatoo habitat trees; and
- implement dieback and weed management strategies.



## 1.5. Site map

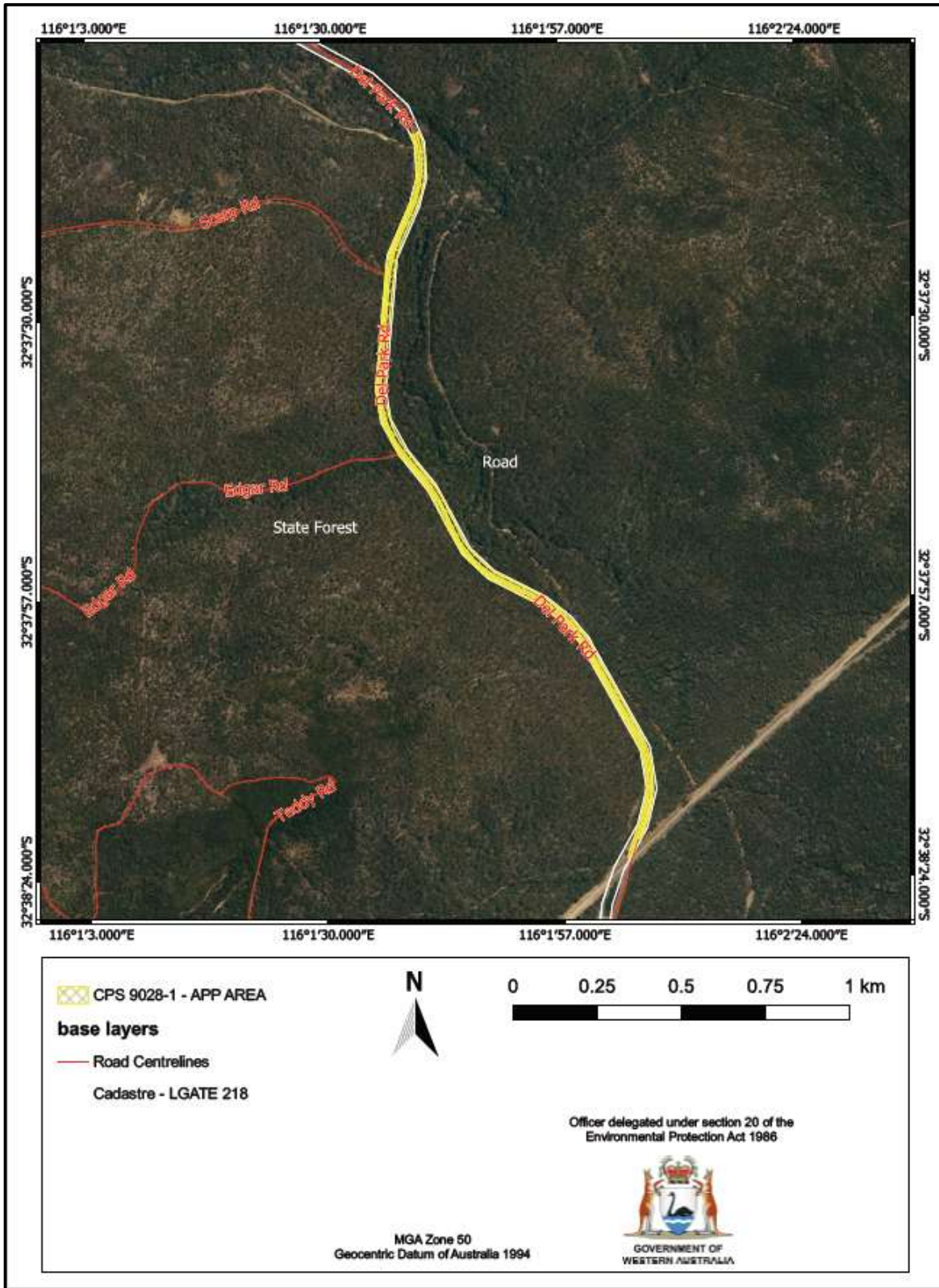


Figure 1. Map of the application area CPS 9028/1. The area cross-hatched yellow indicates the area within which 0.54 hectares of native vegetation is authorised to be cleared under the granted clearing permit.

## 2. Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 3), 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; and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

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

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER October 2019)

## 3. Detailed assessment of application

### 3.1. Avoidance and mitigation measures

The Shire of Murray is planning the widening of Del Park Road for road widening and powerline replacement. Engineering specifications have been provided (Appendix F). Clearing has been reduced to the minimum required, with an average of 1.5 metres on both sides of Del Park Road, Banksiadale. Trees and native vegetation will be retained as much as possible within the areas required, and wherever feasible trees will be lopped by a professional tree lopper *in lieu* of (Shire of Murray 2021a). Sixteen black cockatoo habitat trees have been identified over the application area, with a diameter at breast height (DBH) of over 500 millimetres. None of the habitat trees possess hollows suitable for use by black cockatoos (Appendix E3). The Shire of Murray has committed to retaining 13 habitat trees (Shire of Murray 2021b).

### 3.2. Assessment of environmental impacts

In assessing the application in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix B) and considered whether the clearing poses a risk to environmental values and whether these can be managed to be environmentally acceptable. An assessment against the Clearing Principles is contained in Appendix C.

The assessment identified that the clearing may pose a risk to the environmental values of biological values and conservation areas, and that these required further consideration. 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. Environmental value: biological values (flora) – Clearing Principles (a) to (d)

**Assessment:** The application area is situated within the Northern Jarrah Forest subregion (JAF01) and proposed clearing comprises native vegetation on both sides of Del Park Road, Dwellingup. The application area comprises the south west forest vegetation unit (Mattiske and Havel 1998) of Murray 1, D1 (SWF 206) with vegetation consisting of an open forest of predominantly regrowth *Eucalyptus marginata* and *Corymbia calophylla*. Vegetation is along an existing road verge and in Degraded to Good condition using the values of Keighery (1994) (Appendix E1).

There are no significant ecological communities mapped within 5.5 kilometres of the application area. Vegetation of the application area does not align with any mapped Threatened Ecological Community endorsed by the Western Australian Minister for the Environment, or Priority Ecological Community listed by DBCA.

One Threatened flora taxa listed under the *Biodiversity Conservation Act 2016* identified from the local area occurs in soil types analogous with the application area; the Vulnerable *Anthocercis gracilis*. Although this species can be found in soils similar to that of the application area, that is sandy or loamy soil, it is most often associated with granite outcrops that are not present within the application area. In addition, *Anthocercis gracilis* has not been recorded within 6 kilometres of the proposed clearing and is unlikely to be present.

Nineteen Priority flora taxa listed by the DBCA have been recorded from the local area of which habitat and soils is consistent with four taxa (two Priority 3, and two Priority 4), and these have been assessed as possibly occurring over the application area.

- *Acacia horridula* (P3) can occur in gravelly soils, sand and rocky hillsides in loam over laterite and has been recorded within 400 metres of the application area. *Acacia horridula* has been recorded from the Jarrah Forest and Swan Coastal Plain Bioregions from Gingin, north of Perth, east to Beverley and south to Harvey (WAH 1998-).
- *Boronia capitata* subsp. *gracilis* (P3) occurs on white or grey sands and hillslopes and has been recorded within 21 metres of the application area. *Boronia capitata* subsp. *gracilis* has been recorded from the Jarrah Forest, Swan Coastal Plain, and Warren Bioregions. The application area is close to the northern extent of its range with records from Ravenswood south to Yallingup (WAH 1998-).
- *Boronia tenuis* (P4) can occur in lateritic, stony soils and has been recorded within 4.2 kilometres of the application area. *Boronia tenuis* has been recorded from the Jarrah Forest and the Swan Coastal Plain Bioregions from Chittering north of Perth to Dunsborough (WAH 1998-).
- *Calothamnus graniticus* subsp. *leptophyllus* (P4) occurs in lateritic gravels including disturbed areas, and has been recorded within 100 metres of the application area. *Calothamnus graniticus* subsp. *leptophyllus* has been recorded from the Jarrah Forest and Swan Coastal Plain Bioregions from north of Perth, to Harvey and east of Collie (WAH 1998-).

One Priority 3 fungi (*Amanita kalamundae*) is also known from the local area. This species has a widespread distribution from Perth to Albany, and if present within the application area impacts to its population status would be negligible.

No TECs, PECs or Threatened flora taxa are likely to occur over the application area, however, two Priority 3 and two Priority 4 flora taxa, possibly occur within the application area. The application area is narrow, and located immediately adjacent to an existing road, and edge effects are likely to inhibit the occurrence of Priority flora taxa. The Priority species identified with the potential to occur have relatively large distributions, and given that the vegetation type and soil types within the application area extend over a large areas around and beyond the application area it is likely that, if present, each of these species would occur in similar numbers in expansive areas associated with the adjacent State Forest 14, and any potential impact would be insignificant.

Noting that the vegetation under application forms part of a very large remnant that is contiguous with State Forests, the proposed clearing may result in the spread of weeds and dieback (*Phytophthora* sp.) into areas managed by DBCA and vested in the Conservation and Parks Commission. Weed and dieback management practices would assist in minimising this risk.

**Outcome:** Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions in relation to this environmental value.

**Conditions:** To address the above impacts, the following conditions will be added to the permit:

- Implement dieback and weed management strategies.

### **3.2.2. Environmental value: biological values (fauna) – Clearing Principle (b)**

**Assessment:** According to available databases, four birds, ten mammals and one reptile of conservation significance have been recorded within ten kilometres of the application area (Appendix B2d).

The application area represents the general habitat requirements of the Vulnerable chuditch (*Dasyurus geoffroii*), Conservation Dependant South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*), as well as the Priority 4 listed Western Brush Wallaby (*Notamacropus irma*), Western False Pipistrelle (*Falsistrellus mackenziei*) and the Darling Range Heath Ctenotus (*Ctenotus delli*). That is, sclerophyll forests of the Darling Plateau. The chuditch and Brush-tailed Phascogale are 'critical weight range' (CWR) mammals whose distribution and abundance have declined severely, most likely due to fox and feral cat predation (Burbidge and McKenzie 1989). Both are wide-ranging with large home ranges requiring large areas of habitat such as Lane Poole Reserve approximately 11.25 kilometres to the south where feral predator control is being implemented (DBCA 2020b). The Western Brush Wallaby has been recorded in the vicinity, but is a grazer and optimum habitat is more open forest or woodland, particularly open seasonally wet flats with low grasses (DBCA 2020c). The Western False Pipistrelle (a bat) may potentially overfly the application area, however, its range has contracted to old growth forest and higher rainfall eucalypt woodlands (Richards *et al.* 2012). The Darling Range Heath Ctenotus (a skink) typically requires dense undergrowth not present over the application area, but also occurs on laterites of the Darling Plateau (Smithies 2016).

Of the vertebrate fauna species of conservation significance identified, the species most likely to occur over the application area are the three vagile species of Threatened black cockatoo species that could utilise the tree canopy

present, as well as the Priority 4 quenda (*Isoodon fusciventer*). Quenda are known from the vicinity and within 2.6 kilometres of the application area. Quenda require a dense understorey for cover (van Dyck and Strahan 2008). The narrow strip proposed for clearing is unlikely to provide large areas of dense vegetation. Proposed clearing is unlikely to remove core habitat for the quenda, nor inhibit the species capacity to disperse across the landscape.

The Endangered Carnaby's cockatoo (*Calyptorhynchus latirostris*) and Baudin's cockatoo (*Calyptorhynchus baudinii*), as well as the Vulnerable forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) are all known from the vicinity of the application area. Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up to 12 kilometres from an active breeding site (Commonwealth of Australia 2017; DPaW 2013; DSEWPaC 2012; EPA 2019). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC 2012; Commonwealth of Australia 2017; DPaW 2013) but may range up to 20 kilometres (Commonwealth of Australia 2017).

Black cockatoo night roosts are usually located in the tallest trees of an area, and in close proximity to both a food supply and surface water (DAWE 2020). Flocks will use different night roosts, often for weeks, or until the local food supply is exhausted. Flocks show some fidelity to night roosts with sites used in most years to access high-quality feeding sites. However, not all night roosts are used in every year (DPaW 2013).

Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia 2017).

The BirdLife Australia Great Cocky Count (Peck *et al.* 2019) identified four confirmed night roosts within 12 kilometres of the application area being utilised during the 2019 season including four used by 'white-tailed black cockatoos' and, of these, two being shared with the forest red-tailed black cockatoo, the closest of which is approximately 8.2 kilometres north-west of the application area.

Peck *et al.* (2019) combine Carnaby's cockatoo and Baudin's cockatoo records as 'white-tailed black cockatoos', however, numerous records of both species have been made from the local area and it can be assumed that along with the forest red-tailed black cockatoo, both Carnaby's cockatoo and Baudin's cockatoo roost within 12 kilometres of the application area.

The application area is within the breeding distribution for all three black cockatoo species, however, no active black cockatoo breeding sites have been recorded from the local area. (There are several recorded breeding sites for both 'white-tailed black cockatoos' and the forest red-tailed black cockatoo within 35 kilometres of the application area).

The application area is located within foraging distance of confirmed black cockatoo roosts, and potentially within foraging distance from unrecorded breeding sites, and the application area should be viewed in respect to supporting breeding and foraging resources for local populations of Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo .

A black cockatoo habitat assessment was undertaken over the application area by Emerge (2021). Sixteen habitat trees with a diameter at breast height (DBH) greater than 50 centimetres were recorded over the application consisting of ten jarrah (*Eucalyptus marginata*) and six jarri (*Corymbia calophylla*). No habitat trees contained any hollows considered potentially suitable for use as breeding habitat by black cockatoos (Appendix E2; Appendix E3), and no roosts or secondary evidence of roosting was observed (Emerge 2021).

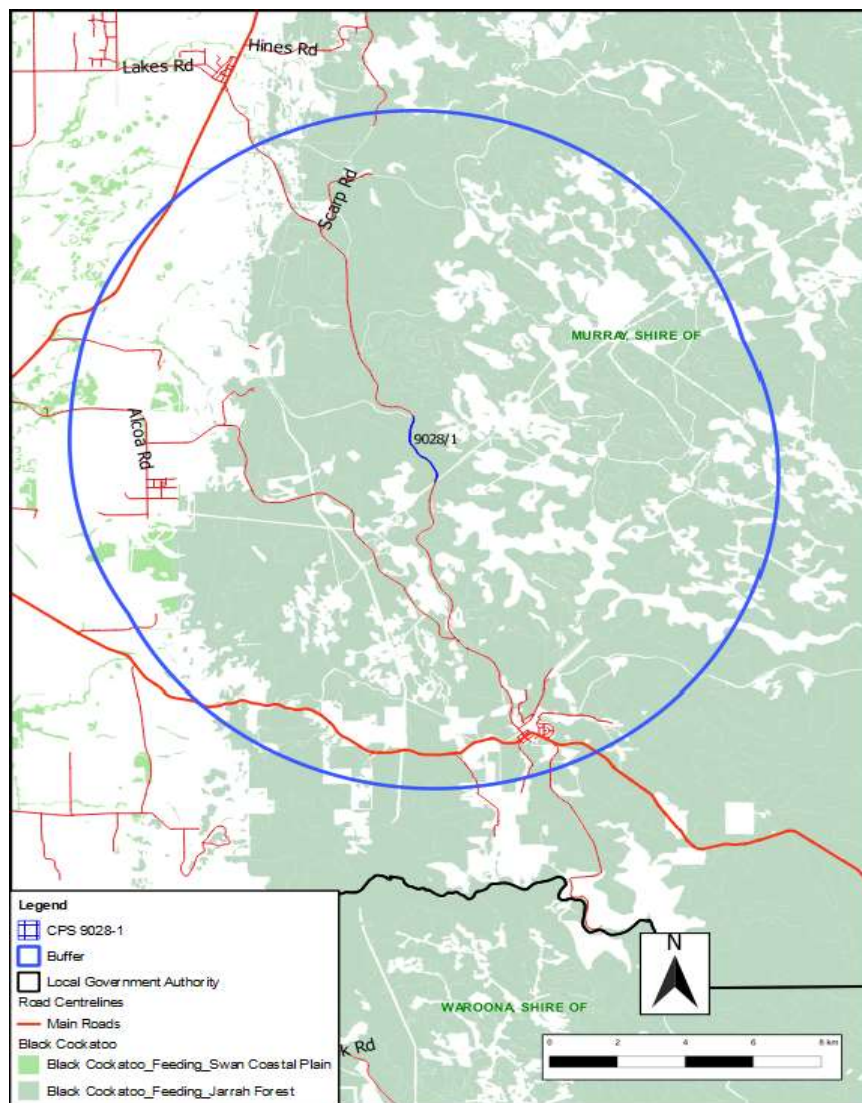
All three black cockatoo species forage on the jarri and jarrah canopy dominating the application area with forest red-tailed black cockatoo feeding predominantly on jarrah but also marri, Baudin's cockatoo feeding on marri but also jarrah and Carnaby's cockatoo feeding predominantly on proteaceous plant species, but also marri and jarrah.

Emerge (2021) recorded a total of 2.2 hectares of foraging habitat was mapped over the 3.99 hectare application area. The foraging habitat occurs as jarrah / marri forest and comprises primary foraging plants for Carnaby's cockatoo and forest red-tailed black cockatoo and a mixture of primary and secondary foraging plants for Baudin's cockatoo.

No evidence of black cockatoo roosting activity was observed over the application area, and no trees contained a potential breeding hollow. The Shire of Murray has committed to retaining 13 of the 16 identified black cockatoo habitat trees (Section 3.1). If required, individual habitat trees will be lopped by a professional tree lopper *in lieu* of clearing.

The application area is within foraging distance of known roosts utilised by three Threatened black cockatoo species and foraging habitat is present within the application area consisting of overstorey eucalypt trees. A total of 2.2 hectares of foraging habitat over the 3.99 hectare application area was recorded. Proposed clearing is for 0.54 hectares within the 3.99 hectare application area of which a proportion will consist of primary and secondary foraging habitat. If the entire clearing area was to encompass foraging habitat, over 1.6 hectares of foraging habitat would remain within the application area.

Approximately 26,724 hectares, or 72.4 per cent, of native vegetation has been retained within a ten kilometre radius of the application area (Figure 2), the majority of which is in lands managed by DBCA. Clearing of up to 0.54 hectares of black cockatoo foraging habitat is unlikely to impact the three species of black cockatoo known to occur over the application area at either the local or regional scales.



**Figure 2. Distribution of potential black cockatoo foraging habitat within 10 kilometres of the application area**

Noting that the vegetation under application forms part of a very large remnant that is contiguous with State Forests the proposed clearing may result in the spread of weeds and dieback (*Phytophthora* sp.) into areas managed by DBCA and vested in the Conservation and Parks Commission. Weed and dieback management practices would assist in minimising this risk.

**Outcome:** Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions in relation to this environmental value.

**Conditions:** To address the above impacts, the following conditions will be added to the permit:

- Avoid 13 black cockatoo habitat trees; and
- Implement dieback and weed management strategies.

### 3.2.3. Environmental value: nearby conservation areas – Clearing Principle (h)

**Assessment:** Proposed clearing is located entirely within the Del Park Road Reserve (PIN 1362205). Adjacent to the Del Park Road Reserve is Dwellingup State Forest (F14), an A Class Reserve vested in the Conservation Commission of WA, and managed by the DBCA. The application area and surrounding areas are not located within an Environmentally Sensitive Area (ESA). Proposed clearing comprises native vegetation on both sides of Del Park Road Banksiadale in predominantly Degraded to Good condition utilising the values of Keighery (1994).

State Forests are lands managed for recreation and nature conservation, to protect water catchments, and to provide for a sustainable resource use. State Forest 14 abuts Lane Poole Reserve approximately 11.25 kilometres to the south-west of the application area. Lane Poole Reserve is a Conservation Park which is managed identically to a National Park and is a site for Western Shield, a DBCA managed conservation program that focuses on broadscale introduced predator control and the recovery of Threatened species (DEC 2011; Mawson 2003).

Vegetation of the application area is contiguous with State Forest 14. However, the entire road reserve will not be cleared, leaving a buffer of vegetation between Del Park Road and State Forest (F14) and direct impacts are unlikely. Secondary impacts from the clearing proposed have the potential to effect State Forest 14. Standard and staged road construction methodologies will be implemented including strategies for drainage controls and wind and water erosion. Soils will not be excavated at depth, and any indirect impacts to surrounding vegetation, soils, or drainage systems can also be managed through appropriate design (Appendix F).

Over 86 per cent of the SWF (206) Murray 1 vegetation complex has its original extent remaining (Government of Western Australia 2019) and within a ten kilometre radius of the application area over 72 per cent of native vegetation is retained. Vegetation over the application area is not a component of the riparian vegetation and the application area is not considered significant as a remnant of native vegetation in an area that has been extensively cleared.

The clearing of up to 0.54 hectares of native vegetation along both sides of the existing Del Park Road alignment is unlikely to impact State Forest 14 or regional vegetation. However, the construction process has the potential to introduce or spread dieback and weeds into adjacent native vegetation managed for conservation purposes, and the implementation of dieback and weed management strategies will reduce this risk.

**Outcome:** Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions (see below) in relation to this environmental value.

**Conditions:** To address the above impacts, the following conditions will be added to the permit:

- Implement dieback and weed management strategies.

### 3.3. Relevant planning instruments and other matters

The application was advertised on the DWER website for a 21 day public comment period. No public submissions were received in relation to this application.

Local government approvals under the *Planning and Development Act 2005*, or any other Act, are not required and clearing is consistent with the Shire of Murray Town Planning Scheme No. 4.

The application area is located within the Dandalup River System surface water area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). There are no rivers proclaimed under the RIWI Act in the vicinity of the application area. No beds or banks of any watercourse will be impacted, abstraction of groundwater or surface water will not be undertaken, and permitting under the RIWI Act will not be required.

The application area is located within a public drinking water source area (P1); the South Dandalup Pipehead Dam Catchment Area. The application area is not located within any wellhead or reservoir protection zones. Clearing is relatively minor, and outside of defined wellhead and reservoir protection zones, however, the applicant should refer to best management practices when undertaking proposed clearing including Water Quality Protection Notes numbers 44 (Roads near sensitive water resources), 10 (Contaminant spills) and 56 (Tanks for fuel and chemical storage near sensitive water resources) available from the DWER website.

The application area is located within the boundaries of the Gnaala Karla Booja Indigenous Land Use Agreement (WI2015/005) and registered Native Title claim (WAD6274/1998). The application area intersects Aboriginal Heritage Place ID 3687 (Wurdaatji Cave), and the Dandalup River (Place ID 27937) is immediately adjacent to the east, and intersects the application area in the north. It is the applicant's responsibility to ensure compliance with any obligations under the *Aboriginal Heritage Act 1972*.

## Appendix A –Information provided by applicant

Summary	Reference
Supporting Information for clearing permit application CPS 9028/1 including a justification and description of clearing activities, avoidance and minimisation actions, and representative photographs of the application area.	Shire of Murray (2020)
Additional supporting information for clearing permit application CPS 9028/1 that included avoidance and minimisation actions, and a black cockatoo habitat assessment that considered the habitat variables of breeding habitat, roosting habitat, and foraging habitat for three species of black cockatoo recorded from the local area.	Shire of Murray (2021a) Emerge (2021)
Additional information for clearing permit application CPS 9028/1 that included the avoidance of 13 of 16 identified black cockatoo habitat trees.	Shire of Murray (2021b)

## Appendix B – Site characteristics

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

### 1. Site summary

Site characteristic	Details																										
<b>Local context</b>	<p>The application area is situated within the Jarrah Forest bioregion (JAF) of Thackway and Cresswell (1995), and the Northern Jarrah Forest subregion (JAF01). The proposed clearing area comprises 0.8 hectares on both sides of Del Park Road, Banksiadale.</p> <p>Spatial data indicates that the local area (ten kilometre radius of the proposed clearing area) retains over 72 per cent of the original native vegetation cover.</p>																										
<b>Vegetation description (Mattiske and Havel 1998)</b>	<p>Mattiske and Havel (1998) as updated by Webb <i>et al.</i> (2016) have described and mapped the application area as:</p> <ul style="list-style-type: none"> <li>• Central portion <ul style="list-style-type: none"> <li>○ Murray 1, D1 (SWF 206): Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Corymbia calophylla</i>-<i>Eucalyptus patens</i> on valley slopes to woodland of <i>Eucalyptus rudis</i>-<i>Melaleuca rhapsiophylla</i> on the valley floors in humid and subhumid zones.</li> </ul> </li> </ul> <p>Assessing the photographs provided by the applicant (Appendix E1) and the report of Emerge (2021) overstorey vegetation consists predominantly of regrowth jarrah (<i>Eucalyptus marginata</i>) with some marri (<i>Corymbia calophylla</i>) over low shrubs, consistent with regional mapping. There is no riparian vegetation of <i>Eucalyptus rudis</i> - <i>Melaleuca rhapsiophylla</i> present.</p>																										
<b>Vegetation condition (Keighery 1994)</b>	Based on the representative photographs provided (Appendix E1) vegetation is in Degraded to Good condition utilising the scale of Keighery (1994) (Appendix D).																										
<b>Soil description (Schoknecht, <i>et al.</i> 2004)</b>	<p>The application area is located within the Darling Plateau System. That is, a lateritic plateau with duplex sandy gravels, loamy gravels and wet soils supporting Jarrah-Marri-Wandoo forest and woodland.</p> <p>One soils unit has been mapped and described corresponding to the SWF 206 regional vegetation unit:</p> <ul style="list-style-type: none"> <li>• Murray Subsystem (255MvMY) <ul style="list-style-type: none"> <li>○ Deeply incised valley of the Murray River; red and yellow earths and minor duplex soils; occasional rock outcrops; narrow sandy terrace.</li> </ul> </li> </ul>																										
<b>Land degradation risk (DPIRD 2017)</b>	<p>Land degradation risk ratings are provided in the table below.</p> <table border="1" data-bbox="646 1440 1162 1789"> <thead> <tr> <th rowspan="2">Aspect</th> <th colspan="2">Murray Subsystem</th> </tr> <tr> <th colspan="2">Hazard Rating</th> </tr> </thead> <tbody> <tr> <td>Wind Erosion</td> <td>M1</td> <td>-Medium</td> </tr> <tr> <td>Water Erosion</td> <td>M2</td> <td>+Medium</td> </tr> <tr> <td>Water-logging</td> <td>L2</td> <td>+Low</td> </tr> <tr> <td>Water repellance</td> <td>L1</td> <td>-Low</td> </tr> <tr> <td>Phosphorus export</td> <td>H1</td> <td>-High</td> </tr> <tr> <td>Salinity</td> <td>L2</td> <td>+Low</td> </tr> <tr> <td>Flood Risk</td> <td>L2</td> <td>+Low</td> </tr> </tbody> </table> <p>Acid sulphate soil risk has not been mapped over the application area.</p>	Aspect	Murray Subsystem		Hazard Rating		Wind Erosion	M1	-Medium	Water Erosion	M2	+Medium	Water-logging	L2	+Low	Water repellance	L1	-Low	Phosphorus export	H1	-High	Salinity	L2	+Low	Flood Risk	L2	+Low
Aspect	Murray Subsystem																										
	Hazard Rating																										
Wind Erosion	M1	-Medium																									
Water Erosion	M2	+Medium																									
Water-logging	L2	+Low																									
Water repellance	L1	-Low																									
Phosphorus export	H1	-High																									
Salinity	L2	+Low																									
Flood Risk	L2	+Low																									



Site characteristic	Details
<b>Waterbodies</b>	<p>The application area is located in the Western Darling Range hydrological zone. No wetlands bisect the application area, and there are no geomorphic wetlands within the vicinity of the application area, with the closest located approximately 2.5 kilometres to the west.</p> <p>The South Dandalup River parallels the application area to the east, approximately 30 metres from the application area at its closest point. One very small tributary of the South Dandalup River bisects the application from the west. Approximately 850 metres to the south of the application area is the South Dandalup Dam, upstream of the application area.</p> <p>The Murray Groundwater Area, proclaimed under the RIWI Act, is located approximately 4.5 kilometres to the north-west of the application area.</p> <p>The application area is located within the Dandalup River System surface water area, proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act). There are no rivers proclaimed under the RIWI Act in the vicinity of the application area.</p> <p>The application area is located within a public drinking water source area (P1); the South Dandalup Pipehead Dam Catchment Area. The application area is not located within any wellhead or reservoir protection zones. The application area is not located within a clearing control catchment under the <i>Country Areas Water Supply Act 1947</i> (CAWS Act).</p> <p>Groundwater is mapped at 500-1,000 TDS. That is, 'fresh'.</p>
<b>Conservation areas</b>	<p>The application area is located wholly within the Del Park Road Reserve (PIN 1362205). Immediately adjacent to the Road Reserve to the east and west is Dwellingup State Forest F14, an A Class Reserve vested in the Conservation Commission of WA, and managed by the DBCA. The application area is immediately adjacent to a South West Regional Ecological Linkage (187) associated with the South Dandalup River. The application area is not located within an Environmentally Significant Area (ESA).</p>
<b>Climate and landform</b>	<p>The climate of Dwellingup is warm and temperate. The winter months have higher rainfall than summer months with an annual rainfall of approximately 1,228 millimetres (BOM 2020).</p> <p>The application area is located within the Darling Plateau System. That is, a lateritic plateau with duplex sandy gravels, loamy gravels and wet soils supporting Jarrah-Marri-Wandoo forest and woodland.</p>

## 2. Ecosystem, flora, and fauna analysis

With consideration for the site characteristics set out above, and relevant datasets (Appendix G2), an analysis of relevant ecosystem, flora, and fauna factors are presented below.

### 2a) Ecological Linkages

The application area is immediately adjacent to a South West Regional Ecological Linkage (187) associated with the South Dandalup River.

### 2b) Ecological Communities

There are no significant ecological communities mapped within 5.5 kilometres of the application area. Vegetation of the application area does not align with any mapped Threatened Ecological Community endorsed by the Western Australian Minister for the Environment, or Priority Ecological Community listed by DBCA.

Threatened Ecological Communities	Status	~Closest record
<i>Corymbia calophylla</i> - <i>Kingia australis</i> woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson <i>et al.</i> (1994))	CR	6.8 km east
<i>Banksia attenuata</i> and/or <i>Eucalyptus marginata</i> woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson <i>et al.</i> (1994))	EN	6.7 km east
<i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson <i>et al.</i> (1994))	VU	6.7 km east

Priority Ecological Communities	Status	~Closest record
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P3	5.7 km east

### 2c) Conservation significant flora recorded within ten kilometres of the application area

Three Threatened flora taxa and 19 Priority flora taxa have been recorded within ten kilometres of the application area; One P1; two P2; eight P3 and eight P4.

Threatened flora taxa	Status	No. of records (10kms)	Soils/Habitat present	Likelihood	~Closest record (km)
<i>Synaphea stenoloba</i>	CR	6	No	Unlikely	7.3
<i>Diuris purdiei</i>	EN	1	No	Unlikely	8.7
<i>Anthocercis gracilis</i>	VU	17	Yes	Unlikely	6.0

Priority flora taxa	Status	No. of records (10kms)	Soils/Habitat present	Likelihood	~Closest record (km)
<i>Hibbertia acrotoma</i>	P1	3	Yes	Unlikely	6.1
<i>Grevillea manglesii</i> subsp. <i>ornithopoda</i>	P2	2	No	Unlikely	7.0
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>	P2	1	No	Unlikely	9.7
<i>Acacia horridula</i>	P3	7	Yes	Possible	0.4
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	P3	1	No	Unlikely	9.1
<i>Amanita kalamundae</i>	P3	3	No	Unlikely	0.9
<i>Boronia capitata</i> subsp. <i>gracilis</i>	P3	2	Yes	Possible	0.0
<i>Grevillea manglesii</i> subsp. <i>dissectifolia</i>	P3	2	No	Unlikely	8.8
<i>Lasiopetalum membranaceum</i>	P3	1	No	Unlikely	8.8
<i>Schoenus pennisetis</i>	P3	1	No	Unlikely	7.3
<i>Thysanotus anceps</i>	P3	2	No	Unlikely	8.4
<i>Boronia tenuis</i>	P4	13	Yes	Possible	4.1
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	P4	32	Yes	Possible	0.1
<i>Chorizema ulotropis</i>	P4	1	No	Unlikely	8.8
<i>Eucalyptus x graniticola</i>	P4	1	No	Unlikely	5.7
<i>Parsonsia diaphanophleba</i>	P4	2	No	Unlikely	7.0
<i>Pimelea rara</i>	P4	3	No	Unlikely	0.6
<i>Senecio leucoglossus</i>	P4	2	Yes	Unlikely	6.2
<i>Stylidium ireneae</i>	P4	1	No	Unlikely	9.9

### 2d) Conservation significant fauna recorded within ten kilometres of the application area:

Three black cockatoos of conservation significance are known from the local area and likely to occur over the application area, as is the Priority 4 Quenda.

The Vulnerable Chuditch and Quokka, conservation dependant South-west Brush-tailed Phascogale, and Priority 4 Western Brush Wallaby, Western False Pipistrelle, and Darling Range Heath Ctenotus possibly occur.

Taxon	Common name	Status	Habitat present	Likelihood	~ Closest record (km)
<b>Birds</b>					
<i>Calyptorhynchus baudinii</i>	Baudin's Cockatoo	EN	Yes	Likely	5.9
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo	EN	Yes	Likely	2.0
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black Cockatoo	VU	Yes	Likely	3.4
<i>Leipoa Ocellata</i>	Malleefowl	VU	No	Unlikely	2.2
<b>Mammals</b>					
<i>Bettongia penicillata ogilbyi</i>	Woylie	CR	Yes	Unlikely	7.0
<i>Myrmecobius fasciatus</i>	Numbat	EN	No	Unlikely	8.4
<i>Dasyurus geoffroyi</i>	Chuditch	VU	Yes	Possible	<0.02
<i>Setonix brachyurus</i>	Quokka	VU	No	Possible	<0.02
<i>Phascogale calura</i>	Red-tailed Phascogale	CD	No	Unlikely	9.1
<i>Phascogale tapoatafa wambenger</i>	Brush-tailed Phascogale (SW)	CD	Yes	Possible	3.9
<i>Isodon fusciventer</i>	Quenda	P4	Yes	Likely	2.6
<i>Notamacropus irma</i>	Western Brush Wallaby	P4	Yes	Possible	2.2
<i>Hydromys chrysogaster</i>	Water Rat	P4	No	Unlikely	8.4
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4	Yes	Possible	1.4
<b>Reptiles</b>					
<i>Ctenotus delli</i>	Darling Range Heath Ctenotus	P4	Yes	Possible	4.5

## 2e) Black cockatoo habitat assessment

Habitat trees (DBH >50cm)	No.	Potential hollows
Jarrah ( <i>Eucalyptus marginata</i> )	10	None
Marri ( <i>Corymbia calophylla</i> )	6	None
	<b>16</b>	<b>0</b>

## 3. Vegetation extent

### 3a) Regional vegetation mapping

Factor		Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Protected for Conservation (ha)	Protected for Conservation (%)
SWF (206)	Murray1	208,491	181,039	86.8	17,407	8.3
JAF	Jarrah Forest	4,506,660	2,399,838	53.3	617,065	13.7
JAF(01)	Northern Jarrah Forest	1,898,781	1,108,380	58.4	188,182	9.9

### 3b) Remnant vegetation within ten kilometres of the application area

Remnant Vegetation	Hectares	Remaining %
Total Area (10 km radius)	35,262	100
Remnant vegetation remaining	26,724	72.4

## Appendix C – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment:</u> Vegetation is along an existing road verge and in Degraded to Good condition using the values of Keighery (1994). There are no TECs endorsed by the Western Australian Minister for the Environment or listed under the EPBC Act, nor any PECs listed by the DBCA mapped within 5.5 kilometres of the application area. Three Threatened flora taxa and 19 Priority flora taxa listed by the DBCA have been recorded within ten kilometres of the application area of which habitat is consistent with one Threatened flora taxa and four Priority flora taxa.</p>	Not likely to be at variance	Yes See Section 3.2.1
<p><u>Principle (b):</u> “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.”</p> <p><u>Assessment:</u> Fauna species of conservation significance have been recorded in the vicinity of the application area that have the potential to occur within the habitats present, including; three black cockatoos of conservation significance, as well as the Priority 4 quenda.</p>	Not likely to be at variance	Yes See Section 3.2.2
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> Three Threatened flora taxa have been recorded within ten kilometres of the application area, of which one species occurs in soil types analogous with the application area. Although the Vulnerable <i>Anthocercis gracilis</i> occurs in soil types similar to that of the application area, that is sandy or loamy soil, it most often associated with granite outcrops not present in the application area. In addition, <i>Anthocercis gracilis</i> has not been recorded within 6 kilometres of proposed clearing, and the application area is unlikely to include, or be necessary for, the continued existence of Threatened flora.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> “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.”</p> <p><u>Assessment:</u> No TECs endorsed by the Western Australian Minister for Environment have been mapped within 6.5 kilometres of the application area, with the closest being ecosystems occurring on the Swan Coastal Plain. Vegetation over the application area does not align with any TECs, and the application area is unlikely to comprise the whole or a part of, or be necessary for the maintenance of, a Threatened Ecological Community.</p>	Not at variance	No
<b>Environmental values: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u> The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). One south west forests vegetation complex of Matiske and Havel (1998) has been mapped over the</p>	Not at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p>application area (Mattiske and Havel, 1998 as updated by Webb <i>et al.</i> 2016). That is, SWF (206) Murray 1, D1. This vegetation complex has over 86 per cent of its original extent remaining (Government of Western Australia 2019) (Appendix B3). Within a ten kilometre radius of the application area over 72 per cent of native vegetation is retained (Appendix B3). Vegetation over the application area is not a component of the riparian vegetation associated with the South Dandalup River to the east, and South West Regional Ecological Linkage (187). The application area is not considered significant as a remnant of native vegetation in an area that has been extensively cleared.</p>		
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Immediately adjacent to Del Park Road Reserve (PIN 1362205), within which the application area is situated, is Dwellingup State Forest (F14), an A Class Reserve vested in the Conservation Commission of WA and managed by the DBCA. Secondary impacts from the clearing proposed have the potential to effect State Forest 14.</p>	May be at variance	Yes See Section 3.2.3
<b>Environmental values: land and water resources</b>		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> The application area is located in the Western Darling Range hydrological zone. There are no mapped geomorphic wetlands within the vicinity of the application area, and the South Dandalup River parallels the application area to the east, approximately 30 metres from the application area at its closest point. One very small tributary of the South Dandalup River bisects the application area, however, drainage of this tributary is controlled over the road reserve and there is no riparian vegetation present over the application area. Native vegetation of the application area is not growing in, or in association with, an environment associated with a watercourse or wetland.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The mapped soils of the Murray Subsystem (255MvMY) are generally resistant to water-logging, with a medium risk of water and wind erosion (DPIRD 2017) (Appendix B1). Phosphorus export is rated at a high risk, however, an increase in nutrient output will not be a consequence of the proposed clearing. Standard and staged road construction methodologies will be implemented including strategies for drainage controls and wind and water erosion. Soils will not be excavated at depth, and any impacts to surrounding landscapes, soils, or drainage systems can also be managed through appropriate design (Appendix F). Noting the minor extent of proposed clearing along an existing road, the proposed clearing is not likely to cause appreciable land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> The application area is located within the Dandalup River System surface water area, proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act). The application area is also located within a public drinking water source area (P1); the South Dandalup Pipehead Dam</p>	Not likely to be at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p>Catchment Area. Groundwater is mapped at 500-1,000 TDS. That is, 'fresh'. The application area is not located within any wellhead or reservoir protection zones. The proposed clearing of the Del Park roadside may cause some short term water quality issues in terms of localised surface water sedimentation during works. Standard and staged road construction methodologies will be implemented including strategies for drainage control and water erosion. Soils will not be excavated at depth, and any impacts to surrounding landscapes, soils, or drainage systems can be managed through appropriate design (Appendix F).</p>		
<p><u>Principle (j)</u>: <i>"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."</i></p> <p><u>Assessment</u>: The mapped soils of the Murray Subsystem (255MvMY) are generally resistant to water-logging (DPIRD 2017). The application area is mapped in an area of low (L2) flood risk (DPIRD 2017) and is located outside of any recognised floodplain areas. The hydrology of the area is altered due to existing roadside infrastructure. Surface flow may occur over short distances for short periods during, and immediately after, very intense rainfall. Standard road construction methodologies will be implemented including strategies for drainage controls and water erosion and any potential for flooding can be managed through appropriate drainage design (Appendix F). Given the small scale and linear nature of the proposed clearing, and the standard construction methodologies employed proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.</p>	Not at variance	No

## Appendix D – Vegetation condition rating scale

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

### Measuring Vegetation Condition for the South West and Interzone Botanical Province (Keighery, 1994)

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

**Appendix E –Biological survey information**

**1. Representative photographs of the application area**







## 2. Biological survey excerpts (Emerge 2021)

### 4.3 Species inventory

No black cockatoos were observed within the site during the survey. Indirect evidence of forest red-tailed black cockatoo was recorded in the site in the form of feathers at one location in the north of the site and foraging evidence throughout the site.

### 4.4 Breeding habitat

A total of 16 black cockatoo habitat trees were recorded within the site as shown in **Figure 3**.

The habitat trees comprised 6 *Corymbia calophylla* (marri) and 10 *Eucalyptus marginata* (jarrah).

None of the trees contained hollows suitable for use by black cockatoos.

A summary of the habitat trees recorded within the site is provided in **Table 5** and an inventory in **Appendix C**.

Table 5: Habitat trees recorded within the site

Category	No. trees	No. hollows
Confirmed nest	-	-
Potential nest	-	-
Suitable hollow(s)	-	-
Potentially suitable hollow(s)	-	1
No suitable hollow(s)	16	N/A
<b>Total</b>	<b>16</b>	<b>0</b>

### 4.5 Roosting habitat

No roosts or secondary evidence of roosting was observed within the site during the survey.

Native and non-native trees within the site have the potential to provide roosting habitat for black cockatoos.

### 4.6 Foraging habitat

No black cockatoos were observed foraging within the site during the field survey.

Foraging evidence in the form of chewed marri fruits attributed to forest red-tailed black cockatoos was observed throughout the site.

A total of 2.20 ha of black cockatoo foraging habitat occurs within the site that consists of marri and jarrah trees. The location of the foraging habitat mapped within the site in **Figure 4**.

Marri is a primary foraging plant for all three species of black cockatoo and jarrah is a primary foraging plant for Carnaby's cockatoo and forest red-tailed black cockatoo and a secondary foraging plant for Baudin's cockatoo. All of the mapped foraging habitat comprises a mixture of marri and jarrah and so was classified as comprising primary or a mix of primary and secondary foraging plants by species as outlined in **Table 6**.

Table 6: Proportion of primary, secondary and non-foraging plants within patches of foraging habitat

	Camaby's ha	Baudin's ha	Forest red-tailed ha
Primary foraging plants	2.20	0.82	2.20
Secondary foraging plants	0	1.37	0
Non-foraging plants	0	0	0
<b>Total</b>	<b>2.20</b>	<b>2.20</b>	<b>2.20</b>

### 3. Habitat tree locations (Emerge 2021 data)

EP20-146(01)		Habitat Tree Data								
Easting	Northing	DBH_cm	GPS_no	Species	Forage_ev	Hollows	Hollow_sui	Recorder	Rec_date	BC_Label
408770.6594	6389458.687	53	425	Eucalyptus marginata	None	No	FALSE	MS	11/12/2020	No suitable hollow(s)
408905.7574	6389304.817	50	353	Corymbia calophylla	None	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408721.6135	6389630.53	63	557	Eucalyptus marginata	Unsure (photo)	No	FALSE	SCM	11/12/2020	No suitable hollow(s)
408905.7574	6389304.817	50	353	Corymbia calophylla	None	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408720.8261	6389972.666	53	424	Eucalyptus marginata	None	No	FALSE	MS	11/12/2020	No suitable hollow(s)
409493.8299	6388423.884	50	330	Eucalyptus marginata	None	No	FALSE	MS	10/12/2020	No suitable hollow(s)
408957.9073	6389193.204	57	350	Corymbia calophylla	FRTBC	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408957.9073	6389193.204	57	350	Corymbia calophylla	FRTBC	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
409493.8299	6388423.884	50	330	Eucalyptus marginata	None	No	FALSE	MS	10/12/2020	No suitable hollow(s)
409516.0036	6388451.027	60	343	Eucalyptus marginata	None	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
409379.1246	6388772.081	58	566	Eucalyptus marginata	None	No	FALSE	SCM	11/12/2020	No suitable hollow(s)
408859.6653	6389379.676	52	355	Eucalyptus marginata	Unsure (photo)	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408817.9079	6390416.588	51	358	Corymbia calophylla	FRTBC	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408859.6653	6389379.676	52	355	Eucalyptus marginata	Unsure (photo)	No	FALSE	SCM	10/12/2020	No suitable hollow(s)
408817.9079	6390416.588	51	358	Corymbia calophylla	FRTBC	No	FALSE	SCM	10/12/2020	No suitable hollow(s)













## Appendix G – References and databases

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## 2. GIS datasets

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

- 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)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Regional Parks (DBCA-026)
- Soil and Landscape Mapping – Best Available

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)