



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 9430/1
<b>Permit Holder:</b>	Shire of Waroona
<b>Duration of Permit:</b>	From 23 April 2022 to 23 April 2027

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 improving road safety.

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

Nanga Road reserve (PINs 1371894, 1371892 and 1371872), Nanga Brook  
Lot 1 on Deposited Plan 48286, Nanga Brook

#### **3. Clearing authorised**

The permit holder must not clear more than 1.02 hectares of *native vegetation* including 20 native trees within the area cross-hatched yellow in Figure 1a to 1e of Schedule 1.

### **PART II – MANAGEMENT CONDITIONS**

#### **4. 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:

- 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.

## 5. 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.

## 6. Directional clearing

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

## 7. Soil and water management

- (a) The permit holder must commence road widening and construction of the associated surface water drainage no later than three months after undertaking the authorized activities to reduce the potential impacts from water erosion
- (b) The permit holder must not clear within a 10 m buffer of a water way depicted in Figure 1 (d) of Schedule 1 to reduce the potential impacts on the waterways from water erosion.

## **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 clearing activities generally	<ol style="list-style-type: none"><li>(a) the species composition, structure, and density of the cleared area;</li><li>(b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;</li><li>(c) the date that the area was cleared;</li><li>(d) the direction of clearing;</li><li>(e) the date that construction activities commenced;</li><li>(f) the size of the area cleared (in hectares);</li><li>(g) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with</li></ol>

No.	Relevant matter	Specifications
		condition 4; and (h) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5.

## 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 have the meanings defined.

**Table 2: Definitions**

Term	Definition
CEO	Chief Executive Officer of the department 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.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
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.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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.

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**END OF CONDITIONS**

A handwritten signature in black ink, appearing to be 'Mathew Gannaway', written over a horizontal line.

Mathew Gannaway  
MANAGER  
NATIVE VEGETATION REGULATION

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

30 March 2022

# Schedule 1

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



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



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

Plan 9430/1 - C



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

Plan 9430/1 - D



**Figure 4(d):** Map of the boundary of the area within which clearing may occur. The area crosshatched yellow indicates the areas authorised to be cleared under the granted clearing permit. The area crosshatched red indicates the area within which clearing must not be undertaken.





**Figure 5(e):** Map of the boundary of the area within which clearing may occur



# Clearing Permit Decision Report

## 1 S 9 Application details and outcome

### 1.1. Permit application details

Permit number:	CPS 9430/1
Permit type:	Purpose permit
Applicant name:	Shire of Waroona
Application received:	14 September 2021
Application area:	1.02 hectares of native vegetation
Purpose of clearing:	Improving road safety
Method of clearing:	Mechanical
Property:	Nanga Road reserve (PINs 1371894, 1371892 and 1371872) Lot 1 on Deposited Plan 48286, Waroona
Location (LGA area/s):	Shire of Waroona
Localities (suburb/s):	Nanga Brook

### 1.2. Description of clearing activities

The application is to clear ground cover vegetation and 20 selected native trees distributed along both sides of a portion of the Nanga Road Reserve (see Figure 1 to 5, Section 1.5). The clearing footprint comprises of two parallel strips of road shoulder area, measuring 3 metres wide and approximately 1.65 km long, with a total area of approximately 1 hectare. A portion of the road within the application area traverses the Lane Poole Reserves on both sides. Seven of the trees proposed to be cleared are located outside of the Reserve boundaries, and 13 within.

The clearing is required to improve the safety on the road stretch that has been identified as having significant road hazards. The cleared area will be utilised to widen the sealed road around road bends, install W beam barriers on part of the road, install chevron markers and signage for curves and speed drops in addition to improve the sightlines. The proposed road works is a part of the State's program designed to improve road safety of the rural roads.

### 1.3. Decision on application

Decision:	Granted
Decision date:	30 March 2022
Decision area:	1.02 hectares of native vegetation

### 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 A), relevant datasets (see Appendix F.1), 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 the findings of a Road Safety Audit (Appendix D) and that the project is to improve road safety.

In particular, the Delegated Officer considered the following:

- The proposed clearing would remove some foraging habitat for Black cockatoo species and other conservation significant fauna. Within the context of more than 40,000 hectares of vegetation within the protected reserves immediately surrounding the application area, the foraging habitat being removed within the application area is unlikely to be significant. Inadvertent impact on any individuals present can be minimised and mitigated by applying appropriate management conditions to the permit.
- Clearing may affect the Priority mushroom species known from the local area. However, the impact on individuals, if any, is likely to be temporary and insignificant.
- Clearing may facilitate the introduction and spread of dieback and weeds into adjacent vegetation including the Reserves and State Forests, which could impact on the quality of the vegetation and its habitat values. Appropriate dieback and weed management measures can mitigate this potential impact.
- Clearing in the areas of steep batters may lead to land and water degradation due to water erosion. The potential impacts can be mitigated by ensuring that clearing in areas adjacent to a water course is avoided and sealing of the roadsides and construction of surface water drainage is commenced within two months of the approved clearing.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the proposed clearing is unlikely to lead to long-term adverse impact on the existence, maintenance and habitat of Black cockatoos and other conservation significant fauna and / or appreciable land degradation. Potential impacts can be minimised and managed by imposing appropriate management conditions to the Permit.

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

- avoid and minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- undertake slow, progressive clearing in the direction of adjacent native vegetation to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- commencement of road shoulder sealing and construction of surface water drainage within three months of clearing
- avoid clearing within 10 m buffer of a water course transecting the application area, depicted in Map D (Figure 4).

1.5. Site maps



Figure 1 Map A of the application area

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

Plan 9430/1 - B



<b>Legend</b>	Localities	
Trees to be removed	Local Rd - Other	1:1,000
CPS areas approved to clear		0 20 40 m
Land Tenure		
Local Government Authorities		MGA Zone 50 Geocentric Datum of Australia 1994

Figure 2 Map B of the application area

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

Plan 9430/1 - C

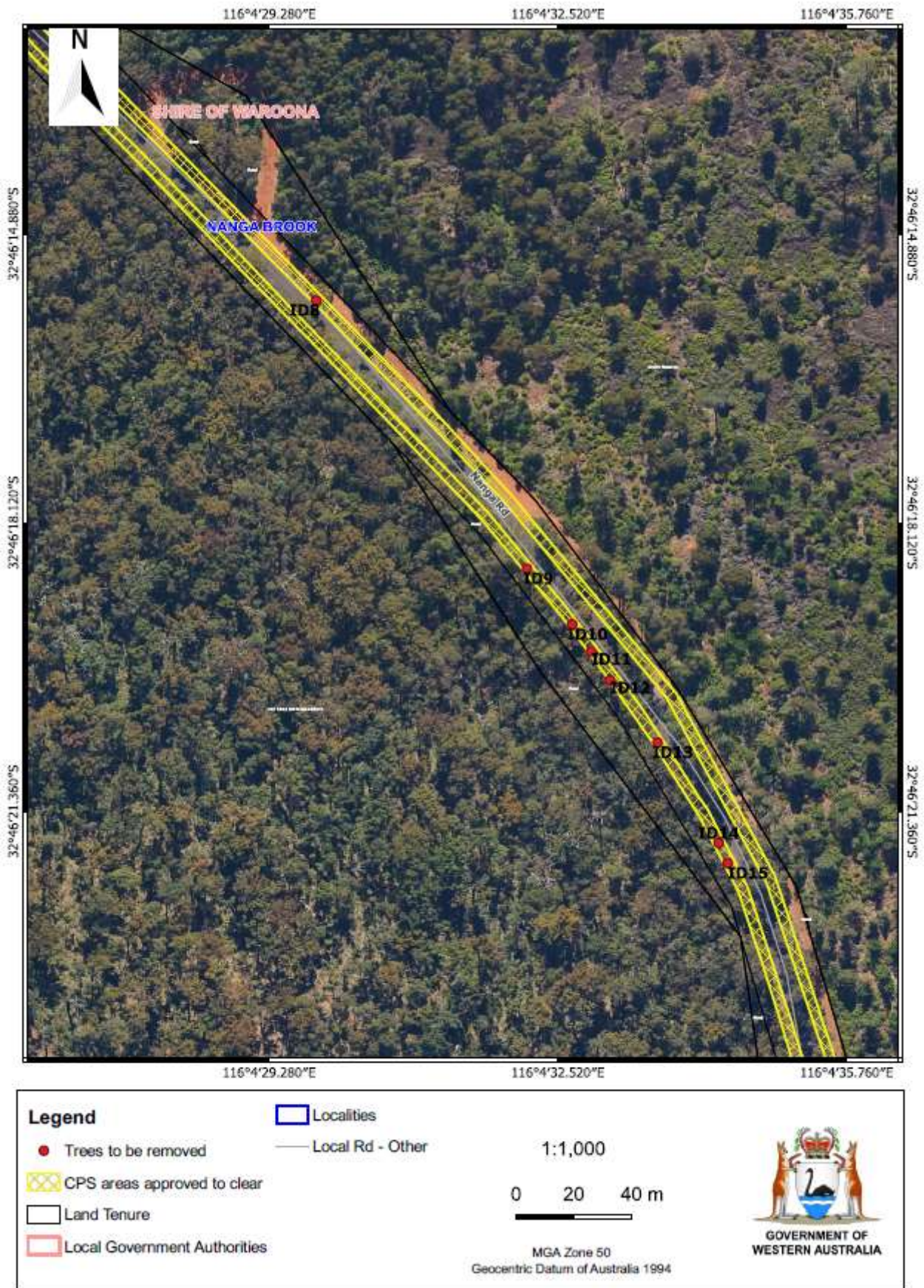


Figure 3 Map C of the application area

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

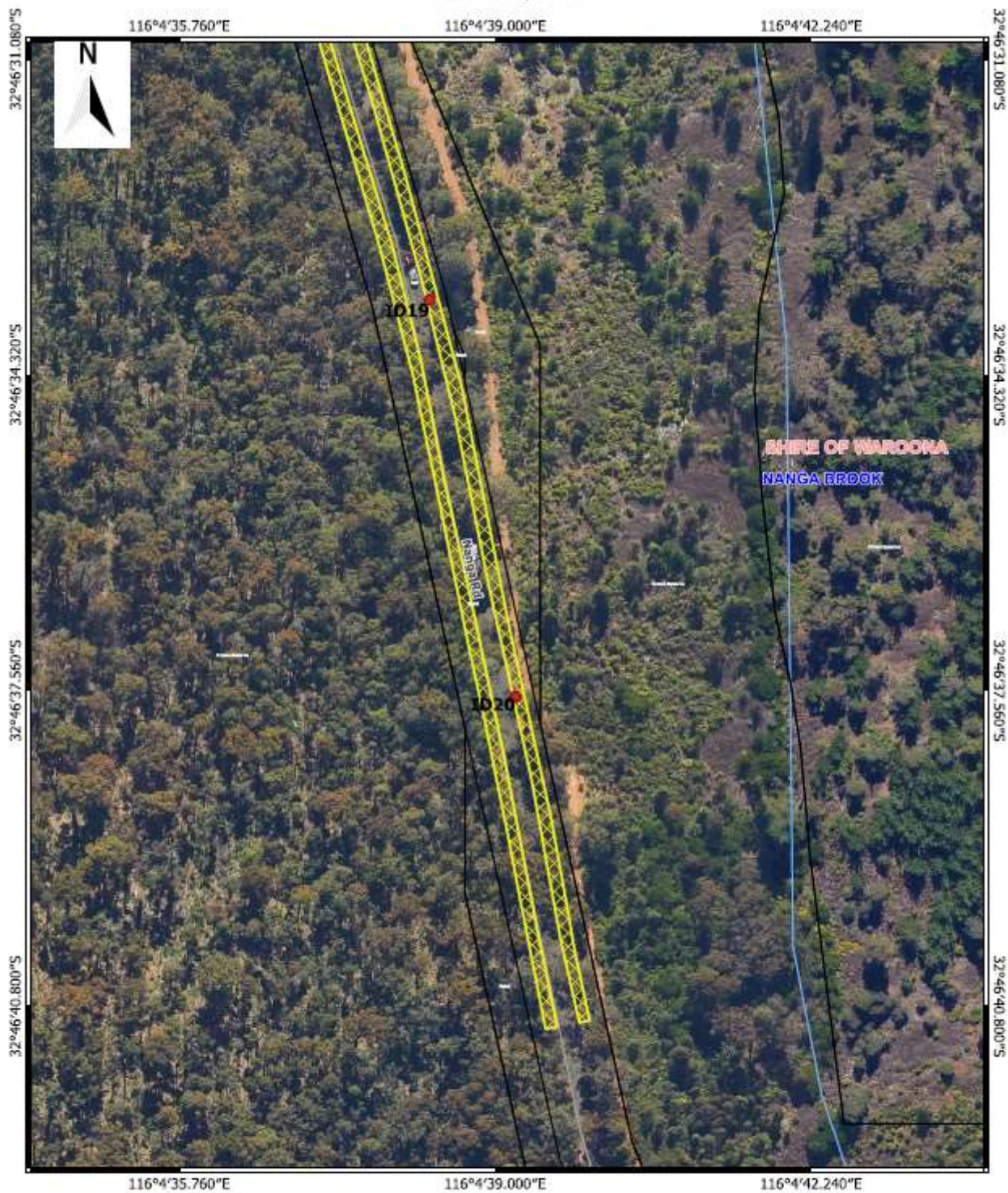
Plan 9430/1 - D



Figure 4 Map D of the application area

The area crosshatched yellow indicates the areas authorised to be cleared under the granted clearing permit. The area crosshatched red indicates the areas within which clearing must not be undertaken.

Plan 9430/1 - E



<b>Legend</b>	Localities	1:1,000	
Trees to be removed	Local Rd - Other		
CPS areas approved to clear	Minor River, Nonpere	0 20 40 m	GOVERNMENT OF WESTERN AUSTRALIA
Land Tenure		MGA Zone 50 Geocentric Datum of Australia 1994	
Local Government Authorities			

Figure 5 Map E of the application area

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



## 2 Legislative context

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

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

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

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

## 3 Detailed assessment of application

### 3.1. Avoidance and mitigation measures

The applicant has demonstrated their commitments and efforts to avoid and minimise clearing and mitigate any potential impacts of the proposed clearing on environmental values. The avoid and minimise principles were considered and exercised throughout the design and decision-making processes for the road works and the application for a clearing permit (Shire of Waroona, 2021a & b; 2022). These considerations include:

- selective clearing based on a survey of the road
- installing barriers which only require a 1.5 m clearance zone in comparison to the standard 3 metres wide road shoulders to limit the removal of large vegetation
- limiting the number of trees to be removed to those that are within 600 millimetres of the edge or the seal
- most vegetation to be removed is ground cover which will be mulched by a Posi Track Mulcher or an excavator with a mulching attachment, which enables the retention of topsoils.

Following a preliminary assessment of potential impact of clearing on a non-perennial water course within the application area, the applicant committed to place a 10 metre buffer from a water course (Figure 4) (Shire of Waroona, 2022). In addition, the applicant has inspected the trees proposed to be cleared for any hollows to ensure that potential impacts on fauna is minimised.

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 in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix A) and considered whether the clearing poses a risk to environmental values. The assessment against the Clearing Principles is contained in Appendix B.

This assessment identified that the clearing may pose a risk to the environmental value(s) of biological values and conservation areas and that these required further consideration. The detailed consideration and assessment of the clearing impacts against the specific environmental values is provided below. Where the assessment found that the clearing presents a risk to environmental values, conditions aimed at controlling and/or ameliorating the impacts have been imposed under sections 51H and 51I of the EP Act. These are also identified below.

### 3.2.1. Biological value – Flora diversity and Conservation Area – Clearing Principles (a) and (h)

#### Assessment

The roadside vegetation over the application area, which is situated on a valley slope, consists of *Eucalyptus marginata*, *Corymbia calophylla* and Pine Tree over *Macrozamia riedlei*, *Xanthorrhoea* sp., *Bossiaea aquifolium* and *Pteridium esculentum*. Apart from the presence of pine trees in the area, the vegetation in the application area is consistent with the mapped vegetation type Murray 1, which is described as Open Forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla*-*Eucalyptus patens* on valley slopes to woodland of *Eucalyptus rudis*-*Melaleuca raphiophylla* on the valley floors in humid and subhumid zones.

There are no Threatened Ecological Communities (TECs) endorsed by the Western Australian Minister for the Environment or listed under the EPBC Act mapped within ten kilometres of the application area. Similarly, there are no Priority Ecological Communities (PECs) listed by the DBCA within ten kilometres of the application area. Being adjacent to the Lane Pool Reserve and the Dwellingup Forest Reserve, parts of the application area and nearby areas may contain high level of flora and fauna diversity. Assessment of potential impacts of clearing on fauna conservation is discussed separately in Section 3.2.2 below.

No Threatened flora taxa listed under the BC Act or EPBC Act have been recorded within ten kilometres of the application area. Fifteen Priority 3 and 4 flora listed by the DBCA have been recorded in the local area. The assessment of the potential impacts of the proposed clearing on the flora has been carried out based on likelihood of their occurrence in the application area. Based on the proximity of records and habitat requirements of the flora species, of the 15 recorded significant flora species, the following flora taxa have been assessed as possibly occurring over the application area:

- *Amanita kalamundae* (P3)
- *Grevillea manglesii* sups. *ornithopoda* (P2)
- *Parsonsia diaphanophleba* (P4) and
- *Stylidium ireneae* (P4)

*A. kalamundae* is recorded from approximately 250 m north of the application area. It is a mushroom species that have been documented from Western Australia (McGurk et.al., 2016, Bougher, 2017). Another *Amanita* taxa, *A. fibrillopes* is also recorded from 6 km of the application. The *Amanita* taxa thrives in sandy clay or lateritic clay soil, in native vegetation with nearby plants including *Taxandria linearifolia*, *Allocasuarina fraseriana*, *Bossiaea ornata*, *Eucalyptus marginata*, *E. diversicolor*, *E. patens*, *E. rudis*, *E. wandoo*, *Macrozamia riedlei*, *Banksia grandis* and *Hakea lissocarpha*. *A. kalamundae* has been recorded in the Northern Jarrah Forest, Southern Jarrah Forest and Avon Wheatbelt IBRA subregions (Department of the Environment, 2013). Given its soil and habitat characteristics, the application area may contain habitat suitable for the mushroom species and mulching of the understory vegetation would affect any individual present at the time of clearing. Noting that mulching is proposed to be the method of clearing of the understory vegetation without removal of topsoils, any impacts on individuals present can be expected to be temporary. Given the widespread distribution of the flora taxa in the forest habitats similar to the application area and the abundance habitat nearby, the potential impacts of clearing are unlikely to affect the conservation status of this species and are not considered to be significant.

*Grevillea manglesii* subsp. *ornithopoda* (P2) can be found in gravelly loam, sandy loam, and clay, including along roadsides, and has been recorded in the local area within 500 metres of the application area. *G. manglesii* subsp. *ornithopoda* has been recorded from the Jarrah Forest Bioregion from Mundaring to Boddington and east to Beverley and Wandering (WAH 1998-). Given the vegetation type and soil types within the application area extend over large areas around and beyond the application area, it is likely that, if present, this species would also occur in similar numbers in expansive areas associated with the adjacent Lane Pool Reserve and the Dwellingup Forest. The potential impacts of clearing in the application area are unlikely to affect the conservation statuses of this species and are not considered to be significant, given the species' distributions and the abundance of nearby habitat. No species of *Grevillea* were observed in the supporting photos provided by the applicant (Shire of Waroona, 2022).

*Parsonsia diaphanophleba* (P4) is a woody climber of up to 10 m high, and often found in alluvial soils along rivers. It's known distribution area includes the Jarrah Forrest and Swan Coastal Plain regions, between Rockingham and Boddington. In the local area, the closest record is from within 250 m of the application area, with most records occurring close to the river. Given its habitat preference, it is unlikely that this flora species would occur over the application area and the potential impacts of clearing on this species is unlikely to be significant. The Applicant's commitment not to clear within 10 m buffer of a non-perennial watercourse transecting the application area (Section 3.2.3) further reduces the likelihood of clearing of this species.

*Stylidium ireneae* is a perennial herb, between 0.1 to 0.28 m high which thrives in sandy loam soils on valleys near creek lines. Its distribution area includes Kwinana, Murray, Waroona, Manjimup and Augusta-Margaret River. In the

local area, the closest record is from 600 m of the application area. Given its habitat preference to creek lines and the abundance of similar habitats nearby, it is unlikely that the roadside vegetation over the application area would comprise a significant habitat for this species. Potential impacts of clearing on this species are unlikely to be significant. The Applicant's commitment not to clear within 10 m buffer of a non-perennial watercourse transecting the application area (Section 3.2.3) further reduces the impacts of clearing of this species.

Parts of the application area traverse the Lane Poole reserve and is adjacent to the Dwellingup Forest (Figure 6). Whilst the proposed clearing of the identified trees is unlikely to significantly reduce the vegetation extent or conservation values of these reserves, clearing of the trees may facilitate the spread of weeds and dieback (*Phytophthora sp.*) into the Reserves and State Forest. Given the limited extent of the proposed clearing, it is considered that these impacts can largely be managed through suitable weed and dieback conditions.

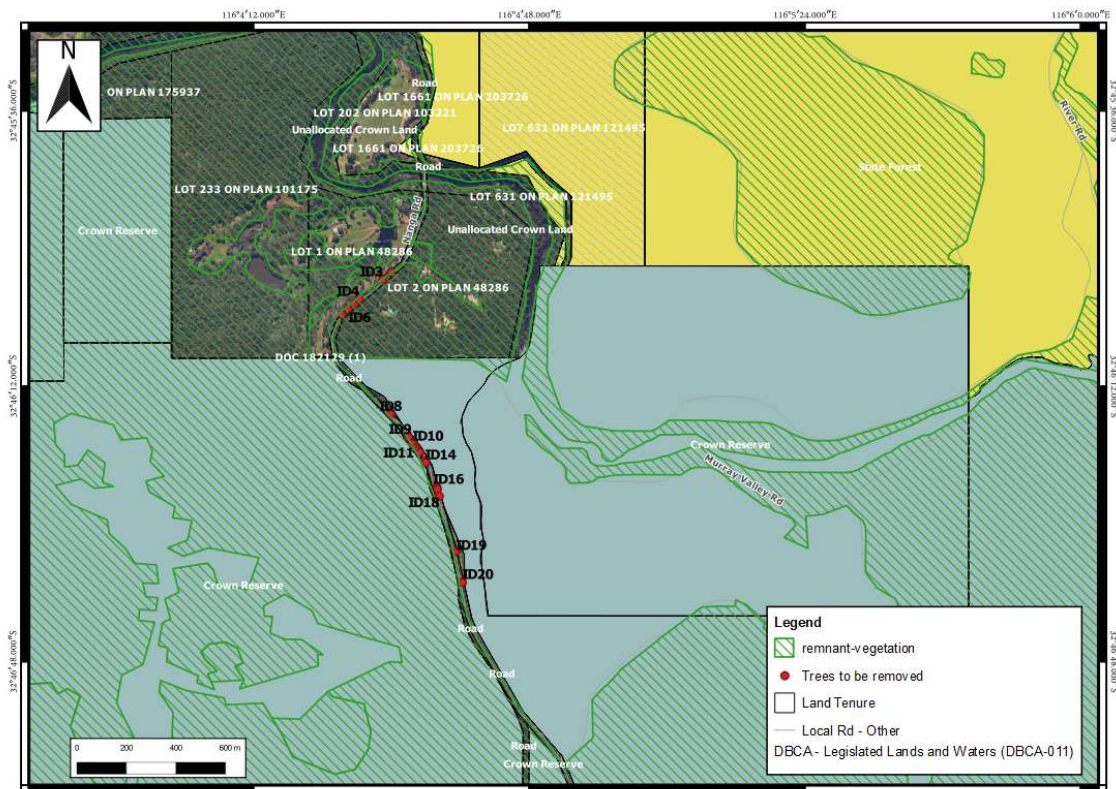


Figure 6. The extent of remnant native vegetation and conservation area (DBCA Legislated Lands) surrounding the application area.

**Conclusion**

Based on the above assessment, the proposed clearing is unlikely to significantly impact the maintenance and conservation status of Priority flora species in the local area. Clearing, however, may introduce and spread weeds and dieback to the nearby vegetation. The impacts can be managed by imposing a management condition on the Permit.

**Conditions**

To address the above impacts, the following management measure will be required on the clearing permit:

- Taking steps to minimise the risk of introduction and spread of weed and dieback.

**3.2.2. Biological value – Fauna – Clearing Principle (b)**

**Assessment**

The vegetation proposed to be cleared comprises of understory vegetation (native) and 20 marri trees (*Corymbia calophylla*). The applicant's survey of the vegetation and trees indicated that the marri trees, although mature, did not contain any hollows that would be suitable for nesting or breeding of native fauna.

The local area has recorded 19 conservation significant fauna species, five of which are classified as Endangered (EN), two Critical (CR), five Vulnerable (VU), two Conservation Dependand (CD), and Priority 3 and 4 (P3/P4). Based

on the number and history of records, proximity of records from the application area and habitat values of the application area, the following fauna species have been assessed as having the most likelihood to occur or be impacted by the proposed clearing:

- *Dasyurus geoffroii* (chuditch, western quoll) – VU
- *Isodon fusciventer* (quenda, southwestern brown bandicoot)
- *Notacarpus irma* (Western bush wallaby)
- *Pseudocheirus occidentalis* (western ringtail possum, ngwayir) – CR
- *Setonix brachyurus* (quokka) – VU
- Black cockatoo species:
  - *Calyptorhynchus latirostris* (Carnaby's cockatoo) -EN
  - *Calyptorhynchus baudinii* (Baudin's cockatoo) – EN
  - *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) – VU

There have been 27 records of Chuditch in the local area with the closest record from 0.35 km of the application area. Chuditch prefers large unfragmented forests with dense riparian jarrah forest. This explains why the large number of records in the local area are from the state forest and reserve nearby. Dispersing Chuditch may forage into the roadsides and the application area, however, the application area is unlikely to comprise significant habitat for Chuditch. The proposed clearing is unlikely to pose significant risks to the maintenance and conservation of this fauna species.

Quenda are known from the local area and within 2.5 km from the application area. Quenda may be present in the local area as it contains tall and dense vegetation, especially within the State Forest areas. The application area, however, does not contain dense understory preferred by quenda for cover (van Dyck, S., and Strahan, R., 2008; Watson 2018). Although dispersing quenda may use the habitat, the availability of the densely vegetated area in the adjacent State Forest indicate quenda is unlikely to be prolonged inhabitants of the application area.

Within the local context, the most recent record of Wallaby was made in 2016 from within approximately 2.5 km of the application area. Given its known home-range of about 10 to 12 ha, Wallaby is likely to roam into the application area. Wallaby prefers *Banksia* spp. woodlands, possibly due to the availability of canopy cover. Not only that *Banksia* woodlands are absent from the application area, but also the roadside vegetation is poor of canopy cover. Consequently, although dispersing Wallaby may utilise the application area, it is unlikely that Wallaby would inhabit the application area. Clearing is unlikely to significantly impact the habitat and maintenance of this fauna species.

Quokka has been recorded at least 10 times in the local area until as recent as 2018. The closest record of quokka is from within 2.4 km of the application area. In the southern forest, quokkas are known to occupy a range of forest, woodlands and wetland ecotypes where habitat is more continuous (DoEC, 2013). The forests adjacent to the application area exhibit the characteristics of potential habitat for quokka. Given the availability of vast and continuous forest nearby, it is considered likely that dispersing quokka utilise the application area and vicinity, but it is unlikely that the application area comprises significant habitat for quokka. The proposed clearing of the roadside trees is unlikely to result in long term adverse impacts on quokka's habitat.

One record of WRP is known from the local area and within 1.65 km. The application area is located outside of the three key management zones for WRP identified by DPaW (2014) based upon core areas of the known current distribution of the species. The application area is therefore located outside of areas mapped as suitable WRP habitat. The photographs and inspection report provided by the application indicated that the vegetation within the application area does not comprise the preferred species for WRP. Given the above, in addition to the availability of intact vegetation within the State Forests nearby, it is unlikely that WRP inhabits the application area. The proposed clearing of the roadside trees is unlikely to impact on the habitat values for WRP within the local context.

Of the vertebrate fauna species of conservation significance identified, the species most likely to occur over the application area are the black cockatoo species. Numerous records of black cockatoo are known from the local area, with the nearest record from within 400 metres of the application area. The application area is mapped within the modelled distribution areas for the Baudin's, Carnaby's and Red-tailed black cockatoos.

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 (DSEWPaC 2012; DPaW 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC 2012; 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 near both a food supply and surface water (Commonwealth of Australia 2017). 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).

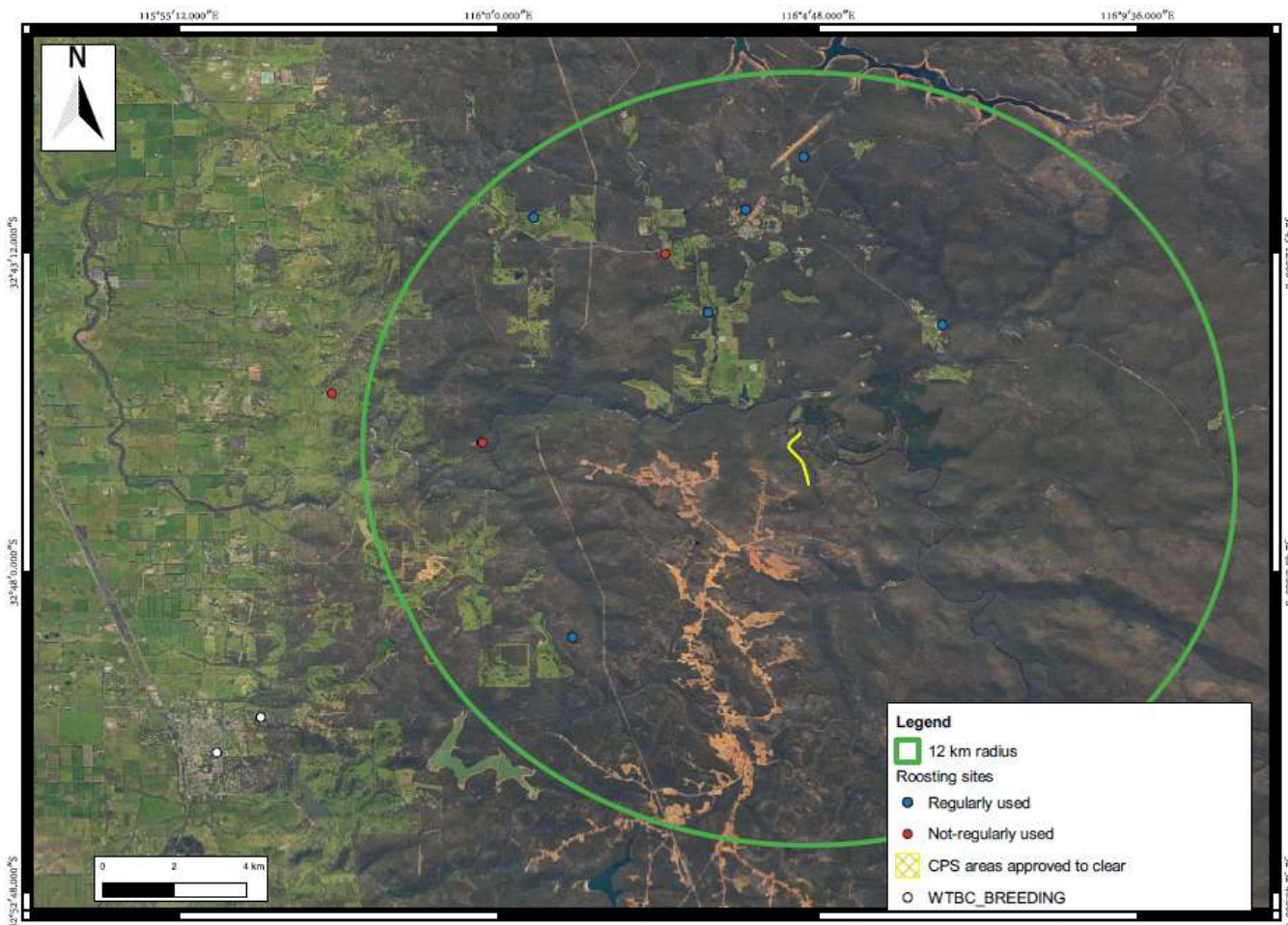


Figure 7. Known black-cockatoo roosting and breeding sites within 12 km radius from the application area.

Within the local context, eight roosting sites have been recorded. According to the most recent black cockatoo survey in the area, at least six of these recorded sites are active roosting sites (Peck, Barret, and Williams, 2019). The nearest active roosting sites include one located approximately 4 km northwest of the application area. One artificial breeding site is recorded within 9 km radius from the application area.

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 *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah) trees present within areas of closed scrub vegetation such as that of Dwellingup Forest and the Lane Poole Reserve are important food resources for black cockatoos.

Inspection by the application of the vegetation in the application area indicated that the 20 trees proposed to be cleared do not contain any hollows (Shire of Waroona, 2022). Notwithstanding this, the marri trees are mature enough to produce nuts and foraging habitat to the Black cockatoos present within the foraging range. Consequently, clearing of the marri trees from the roadsides would remove some of this foraging habitat. However, in the context of the more than 40 hectares of vegetation within the protected reserves nearby, the foraging habitat being removed within the application area is unlikely to be significant. The proposed clearing is not likely to cause a long-term adverse impact on the existence and maintenance of black cockatoos and their habitat within the local context.

### Conclusion

Based on the above assessment, the proposed clearing may clear habitat suitable for fauna. Given the limited extent of clearing, vegetation condition of the application area and the availability of vast, protected and more suitable vegetation within the adjacent reserve and State Forests; the application area is unlikely to comprise significant habitat for fauna within the local context. The proposed clearing is unlikely to result in a detrimental impact on the

conservation of the fauna species. Inadvertent impacts on any individuals present at the time of clearing can be mitigated by applying fauna management measures.

#### Conditions

To address the potential impact to any fauna individual present at the time of clearing, slow clearing in the direction of adjacent native vegetation is required to allow fauna to move into adjacent habitat ahead of clearing activity.

### **3.2.3. Land and water resources – Principle (h)**

#### Assessment

The majority of the road within the application area is situated on steep slopes. Desktop data analysis shows that many parts the slope is averaging 27 percent. Given the steep slope and the average rainfall in the region, the area is prone to water erosion. Soils in the area are also prone to subsurface acidification and nutrient export, typical of forested areas.

Clearing in the area, therefore, may expose the soil surface to water erosion in the high rainfall events, which may exacerbate the risk of nutrient export that would affect the land and water resources nearby. The proposed method of clearing by mulching of the understory vegetation without excavating the topsoils, however, will provide some ground cover to the soil surface, minimising the risks of water erosion. Sealing of the road shoulders, reinforcement of the banks affected by clearing, and construction and maintenance of surface water drainage will also avoid surface water runoff and sediment from entering the surrounding environment. This may mitigate the potential impacts associated with surface runoff. Acknowledging the potential impacts of clearing on the water ways and their habitat values, the applicant is also committed to place a 10 metre buffer around a watercourse intersecting the application area (Figure 4).

#### Conclusion:

Based on the above assessment, the Delegated Officer determined that the proposed clearing is unlikely to cause appreciable water and land degradation due water erosion provided land management practices are applied.

#### Conditions:

To address the above impact, the following are required as conditions to the permit:

- Avoid clearing within 10 m buffer around the intersection between the road and a watercourse as depicted in Figure 4.
- Commencement of sealing of road shoulders and surface water drainage construction within three months of clearing.

### **3.3. Relevant planning instruments and other matters**

The road works requiring the proposed clearing is one of the State Black Spot Program 2021-2022 designed to improve the road safety and reduce serious injuries and deaths on the State's roads (Shire of Waroona, 2021a). The planning of the roadworks has been carried out in accordance with the Guide to Road Design (Austroads) (See Appendix D).

Most of the required clearing is located within the Road Reserves managed by the Shire. A section of the application area occurs within private land, whose owner has provided their authority to access and clear for this purpose.

Several Aboriginal sites of significance and heritage have been mapped within 10 km of 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.

**End**

## Appendix A. 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 the assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B.

### A.1 Site characteristics

Characteristic	Details
Local context	<p>The proposed clearing area of 1.02 hectares of native vegetation along Nanga Brook Road reserve stretches for a distance of 1.65 kilometres. The Nanga Brook locality is within the catchment area of the Murray River, which flows across the Nanga Road approximately 300 m from the application area. The proposed clearing area transects the Lane Poole Reserve and is located adjacent to Dwellingup State Forest.</p> <p>Spatial data indicates the local area (10 km radius of the proposed clearing area) retains approximately 84 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>There are no mapped ecological linkages within the application area but given that the vegetation on either side of the proposed clearing is largely intact, it is likely that species pass over the road as they move across the landscape.</p>
Conservation areas	<p>The application area transects the Lane Pool Reserve (an A Class reserve) State Line Kilometre 0.9 and 2.0 (a distance of approximately 1.1 kilometres). Dwellingup State Forest (Reserve Class A; F14) is adjacent and connected to the Reserve.</p>
Vegetation description	<p>Information provided by the applicant indicated the vegetation within the proposed clearing area consists of the following:</p> <ul style="list-style-type: none"> <li>• <i>Macrozamia riedlei</i></li> <li>• <i>Eucalyptus marginata</i></li> <li>• <i>Xanthorrhoea</i> sp.</li> <li>• <i>Corymbia calophylla</i></li> <li>• <i>Bossiaea aquifolium</i></li> <li>• Pine Tree</li> <li>• <i>Pteridium Esculentum</i></li> </ul> <p>This is consistent with the mapped vegetation type Murray 1, which is described as 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 raphiophylla</i> on the valley floors in humid and subhumid zones.</p> <p>The mapped vegetation type retains approximately 76 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in Degraded to Good condition (Keighery, 1994).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix C. Representative photos and description are available in Appendix D and E.</p>
Climate and landform	<p>The proposed clearing area is located at the top of a valley. Its elevation rises from 135 meters AHD at the starting point in the north to 200 meters AHD as it moves south. The valley in the area is characterised with steep slopes, in the southern part of the application area, for example, the slope is averaging approximately 26 percent.</p> <p>The annual average rainfall is estimated to be 1200 millimetres with an evapotranspiration rate of between 800 and 900 millimetres per year.</p>
Soil description	<p>The soil is mapped as Murray Subsystem which is described as deeply incised valley of the Murray River; red and yellow earths and minor duplex soils; occasional rock outcrops; narrow sandy terrace.</p>
Land degradation risk	<p>The mapped soil type has a high risk of subsurface acidification and nutrient export. It is also mapped as having a moderate risk to water erosion.</p>

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that a minor non-perennial watercourse transect the area proposed to be cleared.
Hydrogeography	The application area is within the Murray River system proclaimed under the <i>RIWI Act 1914</i> . The mapped groundwater salinity within the application area is 500-1000 milligrams per litre, which is described as being marginal.
Flora	Several priority flora have been recorded from within 10 km of the application area. None of the recorded flora is threatened. The closest recorded priority flora included <i>Amanita kalamundae</i> (P3), <i>Grevillia manglesii</i> sub. <i>ornithopoda</i> (P2), <i>Parsonsia diaphanophleba</i> (P4) and <i>Stylidium ireneae</i> (P4) which are located within 1 km from the application area on soil and habitat types similar to the application area.
Ecological communities	No TEC or PEC is mapped within the local area (10 km radius). The closest PEC to the application area is located approximately 38 km west of the application area.
Fauna	Several records of conservation significant fauna have been known from the local area. The records include five Endangered, five Vulnerable, two Critical and some Priority flora (see Table C.4). Among the closest records are that of <i>Dasyurus geoffroii</i> (Chuditch, VU) and <i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo, EN) located approximately 0.35 km and 0.45 km from the application area, respectively.

## 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	4,506,660.25	2,399,838.15	53.25	1,673,614.25	39.43
Vegetation complex					
Murray 1 vegetation complex **	68,695.15	52,296.01	76.13	44,444.95	64.70
Local area					
10 km radius from the application area	41,410	34,844	84.14		

\*Government of Western Australia (2019a)

\*\*Government of Western Australia (2019b)



#### A.4 Flora analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix F.1), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	3	Y	Y/N	N	5.43	1	N/A
<i>Actinotus repens</i>	3	Y	Y/N	N	8.50	1	N/A
<i>Amanita fibrilloses</i>	3	Y	Y/N	Y	6.08	1	N/A
<i>Amanita kalamundae</i>	3	Y	Y	Y	0.25	3	N/A
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	4	Y	Y/N	Y	5.43	3	N/A
<i>Grevillea manglesii</i> subsp. <i>ornithopoda</i>	2	Y	Y	Y	0.50	3	N/A
<i>Parsonsia diaphanophleba</i>	4	Y	Y	Y	0.25	8	N/A
<i>Pimelea rara</i>	4	Y	Y/N	Y	3.56	1	N/A
<i>Senecio leucoglossus</i>	4	Y	Y/N	N	7.47	3	N/A
<i>Stylidium aceratum</i>	3	Y	Y/N	N	9.82	1	N/A
<i>Stylidium ireneae</i>	4	Y	Y	Y	0.60	10	N/A
<i>Tetratheca pilifera</i>	3	Y	Y/N	N	8.95	1	N/A

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

#### A.3 Fauna analysis table

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Atrichornis clamosus</i> (noisy scrub-bird, tjimiluk)	EN	Y	Y	8.50	5	N/A
<i>Bettongia penicillata ogilbyi</i> (woylie, brush-tailed bettong)	CR	Y	Y	8.28	1	N/A
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	Y	2.66	47	N/A
<i>Calyptorhynchus baudinii</i> (Baudin's cockatoo)	EN	Y	Y	2.27	12	N/A
<i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo)	EN	Y	Y	0.45	37	N/A
<i>Calyptorhynchus</i> sp. 'white-tailed black cockatoo' (White-tailed black cockatoo)	EN	Y	Y	2.00	14	N/A
<i>Dasyurus geoffroyi</i> (chuditch, western quoll)	VU	Y	Y	0.35	27	N/A
<i>Falsistrellus mackenziei</i> (western false pipistrelle, western falsistrelle)	P4	Y	Y	5.42	7	N/A

Species name	Conser vation status	Suitable habitat features ? [Y/N]	Suitable vegetat ion type? [Y/N]	Distance of closest record to applicati on area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Geotria australis</i> (pouched lamprey)	P3	Y	Y	3.60	1	N/A
<i>Hydromys chrysogaster</i> (water-rat, rakali)	P4	Y	Y	3.23	4	N/A
<i>Isoodon fusciventer</i> (quenda, southwestern brown bandicoot)	P4	Y	Y	2.53	8	N/A
<i>Leipoa ocellata</i> (malleefowl)	VU	Y	Y	1.74	1	N/A
<i>Myrmecobius fasciatus</i> (numbat, walpurti)	EN	Y	Y	0.86	3	N/A
<i>Notamacropus irma</i> (Western brush wallaby)	P4	Y	Y	2.53	12	N/A
<i>Phascogale calura</i> (Red-tailed phascogale, kenngoor)	CD	Y	Y	5.42	1	N/A
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed phascogale, wambenger)	CD	Y	Y	5.42	2	N/A
<i>Pseudocheirus occidentalis</i> (western ringtail possum, ngwayir)	CR	Y	Y	1.65	1	N/A
<i>Setonix brachyurus</i> (quokka)	VU	Y	Y	2.42	10	N/A
<i>Westralunio carteri</i> (Carter's freshwater mussel)	VU	Y/N	Y	3.59	2	N/A

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

## A.5 Land degradation risk table

Risk categories	Murray 1
Wind erosion	10-30% of map unit has a high to extreme wind erosion risk
Water erosion	30-50% of map unit has a high to extreme water erosion risk
Salinity	3-10% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	3-10% of the map unit has a moderate to high flood risk
Water logging	3-10% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	50-70% of map unit has a high to extreme phosphorus export risk

## Appendix B. 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> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared does not contain significant flora, fauna, habitats, assemblages of plants or threatened or priority ecological community. The local area (10 km radius of the application area), however, contains records of priority flora and fauna. The Dwellingup Forest is also adjacent.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared does not contain any records of conservation significant fauna. The vegetation within the application area, however, contain species that may constitute foraging habitat for conservation significant fauna, including Black cockatoos.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act or EPBC Act.</p>	Not at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that indicate a TEC. No TECS have been recorded within the local area.</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation type and the native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not likely to be at variance	No
<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> Given the distance to the nearest conservation area (Lane Pool Reserve) which is adjacent to the application area on both sides of the road, the proposed clearing may impact the conservation values by the introduction of weeds and/or dieback.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<b>Environmental value: land and water resources</b>		

Assessment against the clearing principles	Variance level	Is further consideration required?
<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 intersects a minor non perennial watercourse. The applicant has committed to avoid clearing within 10 m buffer of this watercourse. Therefore, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.</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 are not susceptible to wind erosion, flood risk or water logging. The mapped soil types have a moderate risk of water erosion and phosphorus export risk and have a high risk of subsurface acidification. Noting the size of the application area and the extent and condition of vegetation surrounding it, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	May be at variance	Yes Refer to Section 3.2.3, above
<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>: Given no water courses, wetlands or Public Drinking Water Sources Areas are recorded within the proposed clearing area, and the closest waterbody is approximately 300 meters away, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<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 and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p>	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. Road Safety Assessment Report and Road Design

The Applicant provided a report from a Road Safety Audit (RSA) (Brad Brooksby Consulting, 2021) in support of the proposed clearing. A Road Safety Audit is a formal, systematic, assessment of the potential road safety risks associated with a new road project or road improvement project conducted by an independent qualified audit team. The assessment considers all road users and suggests measures to eliminate or mitigate any risks identified by the audit team.

The audit was undertaken by Brad Brooksby Consulting on the site on 7 July 2021, taking into account crash history, traffic loads and the standards and guidelines provided by the Guide to Road Design (Austroads). In the past 5 years, the Shire of Waroona had 64 recorded crashes on the Shire's maintained road, 58 percent of which occurred at road curves. Of all crashes, four had occurred along the Nanga Road, particularly on the curves along the section Sk 0.37 – 2.02 which is within the application area. The Nanga Road is traversed by an average of 287 vehicles per day (vpd) on weekdays and 1,100 vpd on weekends. This traffic includes heavy vehicles, which comprise approximately seven percent of all traffic on the road.

The main findings from the Audit are as follows:

- The Nanga Road is a single carriageway with a sealed surface in fair condition approximately 6 m in width, and 0.5 m gravel shoulders in poor condition.
- The road has very steep batters in sections, is typically forested on both verges for much of its length with tree line approximately 2-3 m from the edge of the traffic lane
- Some of the large trees are close to the traffic lane and presenting safety hazards in need of removal
- Vegetation in some several areas restricts sightlines
- Substandard curves exist along the road. The recorded crashes mostly took place on these curves. Advance signage and delineation are recommended to be installed to guide the road user through the curve (see Figure 5)
- The existing gravel shoulder is narrow and in poor condition, carries a risk of run off road crashes. With the traffic volume, the road shoulder should be a minimum of 2.5 m of which 0.5 m is sealed on each side.
- The steep batter in several sections of the road presents significant hazards. Suitable road safety barrier along the road where batter is steep is recommended (see Figure 6)
- Vegetation close to the traffic lane obscures warning signs and guidepost. Removal of the vegetation is recommended
- Overall, the recommendation area:
  - widening of the road pavement to achieve a rural road section of a two 3.0 m sealed traffic lanes with a 1.0 m gravel shoulder. A typical rural road cross section is depicted in Figure 7 below
  - Delineation is to be guideposts and advance warning signs at curves (Figure 5).
  - W Beam barrier is to be installed where run off



Figure 8. From the supporting document. The photograph shows a bend in the road which will require clearing on both sides to ensure sight lines to guideposts and advanced warning signs are suitable. A barrier is proposed to be installed on the southern side. The installation of barriers requires 1.6 meters to comply with the requirements of Austroads: Guide to Road Design Part 6 – Roadside Design Safety and Barriers (2010)



Figure 9. Photograph provided by applicant with comment. The southern side of the road has a steep descent on the batter. The applicant notes that trees within 1.6 meters of the edge of the seal will be removed.

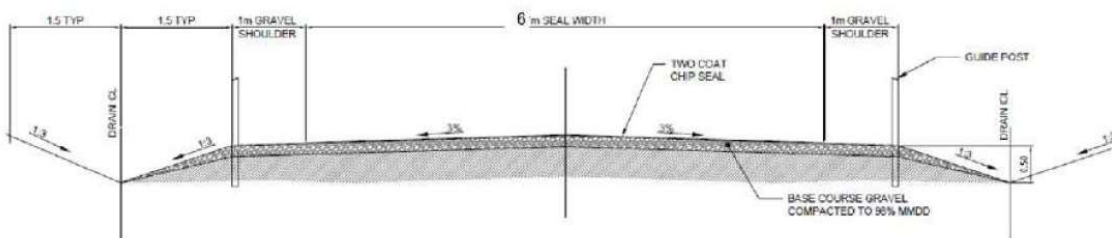
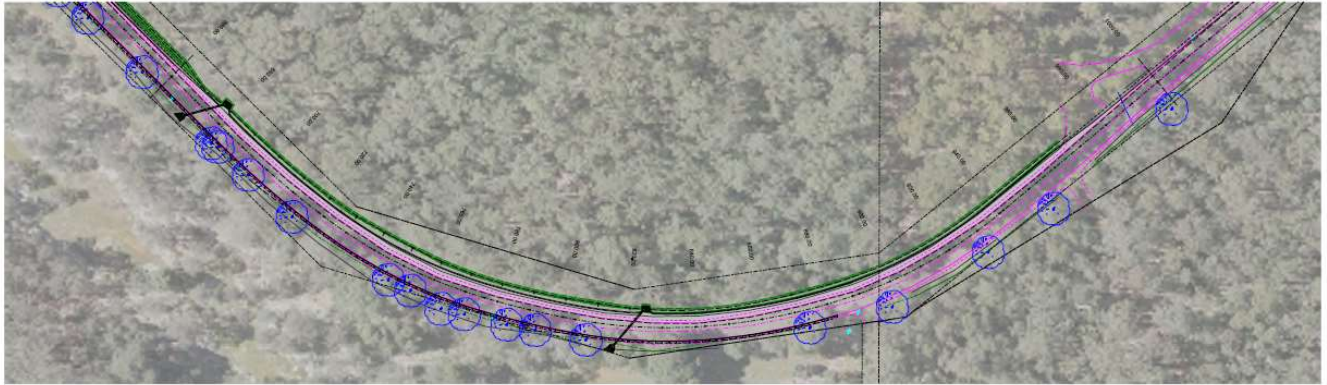
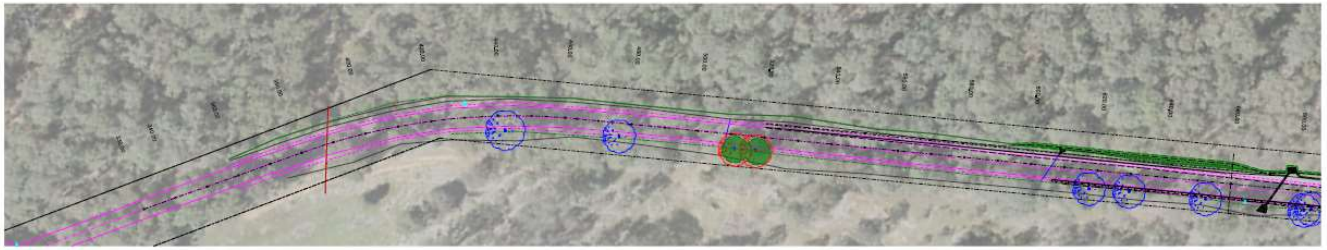
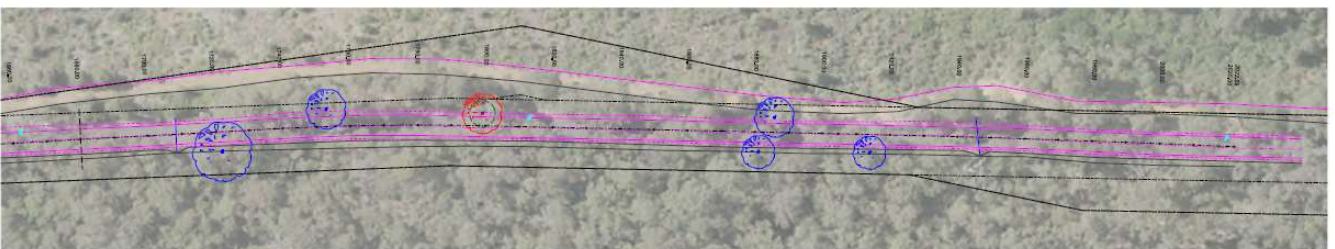
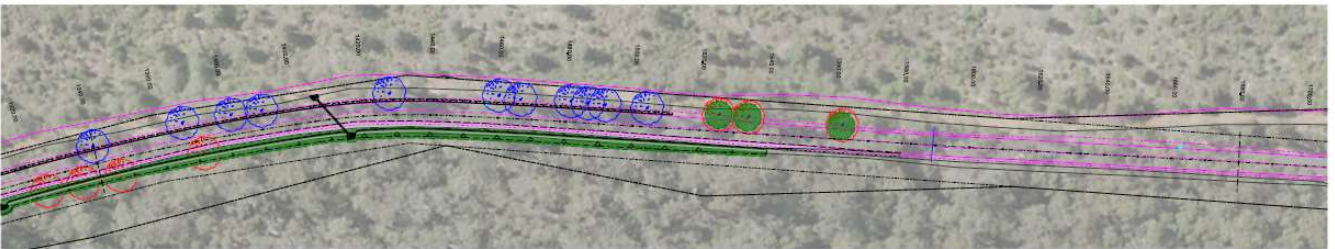
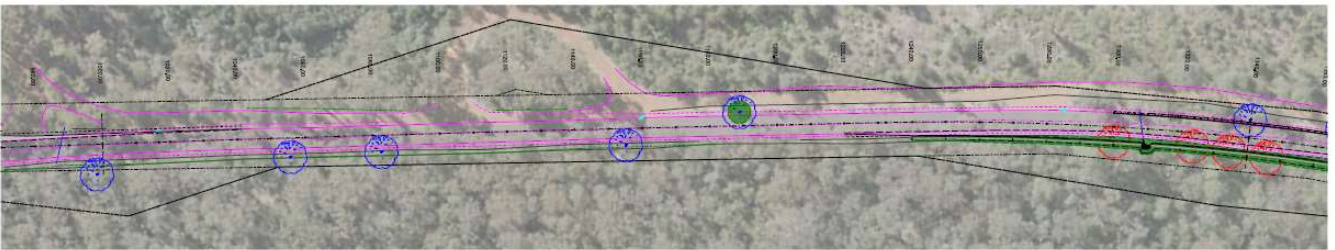


Figure 10. Typical Rural Road Cross Section (Brad Brooksby Consulting, 2021)





SCALE 1:500



SCALE 1:500


Figure 11. Road design. The green lines and polygons indicate the placement of road barriers (Shire of Waroona, 2022).

## Appendix E. Photographs of the vegetation (Shire of Waroona, 2022)

The vegetation proposed to be cleared comprise of 20 trees and the understory vegetation that would be mulched. Applicant provided a breakdown of the vegetation as follows:

Species	Description	Percentage
<i>Macrozamia riedlei</i>	Zamia palm roughly half a metre in height.	3%
<i>Eucalyptus marginata</i>	Commonly known as Jarrah Tree	1%
Genus <i>Xanthorrhoea</i>	Commonly known as the grass tree	1%
<i>Corymbia calophylla</i>	Commonly known as Marri tree.	10%
<i>Bossiaea aquifolium</i>	Shrub or tree known as waster bush.	20%
Pine Tree	Established trees from previous plantations.	5%
<i>Pteridium esculentum</i>	Known as Bracken Fern or bracken.	60%
<b>Total</b>		<b>100%</b>

Table 1 Representative photographs of the marri trees proposed to be cleared and associated information

Tree # and ID	Photograph (trees proposed to be cleared are marked with pink ribbons)	Description
Tree 1 <i>Corymbia calophylla</i>		No visible nests or hollows

Tree 2 and 3  
*Corymbia calophylla*



No visible nets or hollows

Tree 7  
*Corymbia calophylla*



No visible nests or hollows

Tree 18

*Corymbia  
calophylla*



No visible nests  
or hollows

## Appendix F. Sources of information

### F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

### F.2. References

Brad Brooksby Consulting (2021) Road Safety Audit. Stage 3 – Detailed Design. Audit Ref: bbc2020.197.  
Prepared for: Shire of Waroona. Date: 7/07/2021. DWER Ref:

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

- Commonwealth of Australia (2017) Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo.
- Department of Environment and Conservation (2012). Western Australia Wildlife Management Program No. 54. Chudith (*Daysurus geoffroii*) National Recovery Plan. DEC, Bentley, WA
- Department of Environment and Conservation (2013). Quokka *Setonix brachyurus* Recovery Plan. Wildlife Management Program No. 56. Department of Environment and Conservation, Perth, WA.
- Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: [https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2\\_assessment\\_native\\_veg.pdf](https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf).
- Department of Parks and Wildlife (DPAW) (2013) Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Western Australian Department of Parks and Wildlife (Now the Department of Biodiversity, Conservation and Attractions). Perth. Western Australia.
- Department of Parks and Wildlife (DPaW) (2014) Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan. Wildlife Management Program No. 58. Western Australia Department of Parks and Wildlife (now the Department of Biodiversity, Conservation, and Attractions (DBCA). October 2014.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPac) (2012) EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (Endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (Vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (Vulnerable) *Calyptorhynchus banksii naso*. Department of Sustainability, Environment, Water, Population and Communities (now the Department of Agriculture, Water, and the Environment). Canberra.
- Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed 30 June 2020).
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: [https://dwer.wa.gov.au/sites/default/files/Procedure\\_Native\\_vegetation\\_clearing\\_permits\\_v1.PDF](https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF).
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: [http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey\\_Dec13.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf).
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf).
- Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Main Roads Western Australia (2020). State Black Spot Program Development and Management Guidelines. March 2020 edition. Downloaded from <https://www.mainroads.wa.gov.au/globalassets/technicalcommercial/road-safety/black-spot-program/development-and-management-guidelines.pdf>

- Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia*. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- McGurk, L.E., D. Giustiniano, E.M. Davidson, E.L.J. Watkin. 2016. *Amanita wadulawita* (Basidiomycota), a new species from Western Australia, and an expanded description of *A.kalamundae*. *Nutsya*, 27:21-30. Department of Parks and Wildlife.
- Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Povh, L.F, R. Bencini, B.K. Chambers, T.L. Kreplins, N. Williams, P.J. Adams, J. Wan, H.T. Kobryn and P.A. Fleming (2018). Shedding light on cryptic macropodid: home ranges and habitat preferences of translocated western brush wallabies (*Notamacropus Irma*). *Australian Mammalogy* 41(1) 82-91. CSIRO Publishing.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shah, B. (2006) *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Waroona (2021a) *Clearing permit application CPS 9430/1*, received 14 September 2021 (DWER Ref: DWERDT504119).
- Shire of Waroona (2021b) *Supporting information for clearing permit application CPS 9430/1*, received 14 September 2021 (DWER Ref: DWERDT504124).
- Shire of Waroona (2022) *Additional information for clearing permit application CPS 9430/1*, received 1 February 2022, (DWER Ref: DWERDT556636).
- Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnarara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.
- van Dyck, S., and Strahan, R. (2008). 'The Mammals of Australia.' 3rd edition. Reed New Holland: Sydney. ISBN-13: 978-1877069253.
- Watson, Nicholas (2018). Habitat preferences and the effect of habitat reduction on the quenda (*Isodon fusciventer*) in an urban development. School of Veterinary and Life Sciences, Murdoch University, Western Australia.
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed January 2022)