



## CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

<b>Purpose Permit number:</b>	8400/1
<b>Permit Holder:</b>	Shire of Esperance
<b>Duration of Permit:</b>	From 22 July 2020 to 22 July 2025

### ADVICE NOTE

The Crown Reserve referred to in condition 13 of this permit is intended to offset the significant residual environmental impacts identified under CPS 8400/1. The 64.91 hectares that remains within Crown Reserve 4181 is to be a banked offset.

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

### PART I - CLEARING AUTHORISED

- 1. Purpose for which clearing may be done**  
Clearing for the purpose of road construction and upgrades.
- 2. Land on which clearing is to be done**  
Neds Corner Road reserve (PIN 11644162), Coomalbidgup  
Yerritup Road reserve (PIN 11644162), Coomalbidgup
- 3. Area of Clearing**  
The Permit Holder must not clear more than 5.56 hectares of native vegetation. All clearing must be within the areas cross-hatched yellow and shaded green on attached Plans 8400/1a, 8400/1b, 8400/1c, 8400/1d, 8400/1e, 8400/1f, 8400/1g, 8400/1h and 8400/1i.
- 4. Application**  
This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.
- 5. Type of clearing authorised**  
This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out work involving clearing for those activities under the *Local Government Act 1995* or any other written law.

### PART II – MANAGEMENT CONDITIONS

- 6. Avoid, minimise and reduce the impacts and extent of clearing**  
In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:
  - (a) avoid the clearing of native vegetation;
  - (b) minimise the amount of native vegetation to be cleared; and

- (c) reduce the impact of clearing on any environmental value.
- 7. Dieback and weed control**  
When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of weeds and dieback:
- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
  - (b) ensure that no 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.
- 8. Flora management**
- (a) Prior to undertaking any clearing within the area cross-hatched green on attached Plans 8400/1c, 8400/1e and 8400/1g, the Permit Holder shall engage a *botanist* to conduct a *targeted flora survey* for the presence of *threatened flora* and *priority flora* in accordance with the Environmental Protection Authority's *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (December 2016).
  - (b) Where *threatened flora* or *priority flora* are identified in relation to condition 8(a) of this Permit, the Permit Holder shall ensure that no clearing of *threatened flora* or *priority flora* occurs..
- 9. Fauna management - direction of clearing**  
The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other (e.g. east to west) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.
- 10. Threatened ecological community management**  
The Permit Holder shall not clear more than 2.04 hectares of vegetation representative of the 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' threatened ecological community.
- 11. Carnaby's cockatoo habitat management**  
The Permit Holder shall not clear more than 5.56 hectares of vegetation that provides suitable habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*).
- 12. Period in which clearing is authorised**  
The Permit Holder must ensure that road widening and upgrade activities occur within three months of the authorised clearing being undertaken.
- 13. Offset – Crown Reserve 4181**  
By 21 July 2021, the Permit Holder shall provide to the *CEO* a copy of the executed change in purpose of the area cross-hatched red on attached Plan 8400/1j within Crown Reserve 4181 from 'common reserve' to 'conservation'.

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

#### **14. Records to be kept**

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit,
  - (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
  - (ii) the date that the area was cleared;
  - (iii) the size of the area cleared (in hectares);

- (iv) purpose for which clearing was undertaken;
  - (v) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with Condition 6 of this Permit;
  - (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with Condition 7 of this Permit;
  - (vii) actions taken in accordance with condition 9 of this Permit;
  - (viii) the size of vegetation representative of the 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' threatened ecological community cleared (in hectares) in accordance with condition 10 of this Permit;
  - (ix) the size of vegetation that provides suitable foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) in accordance with condition 11 of this Permit; and
  - (x) the date road construction and upgrade activities commenced following cessation of authorised clearing in accordance with condition 12 of this Permit.
- (b) In relation to flora management pursuant to condition 8 of this Permit:
- (i) the location of each *threatened flora* or *priority flora* species recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
  - (ii) the species name of each *threatened flora* or *priority flora* species identified;
  - (iii) a copy of the botanist's flora survey report and complete Metadata and Licensing Statement in accordance with the Environmental Protection Authority's *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments (IBSA)*.

## 15. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 31 July of each year, a written report demonstrating adherence to all conditions of this permit, and setting out the records required under Condition 14 of this permit in relation to clearing carried out between 1 July and 30 June of the previous financial year.
- (b) If no clearing authorised under this Permit was undertaken between 1 July and 30 June of the previous financial year, a written report confirming that no clearing under this permit has been carried out must be provided to the *CEO* on or before 31 July each year.
- (c) Prior to 21 April 2025, the Permit Holder must provide to the *CEO* a written report of records required under condition 14 of this Permit where these records have not already been provided under condition 15(a) of this Permit.

## DEFINITIONS

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

**botanist** means a person with specific training and/or experience in the ecology and taxonomy of Western Australian flora.

**CEO** means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.

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

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

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

**priority flora** means those plant taxa described as priority flora classes 1, 2, 3 or 4 by the Department of Biodiversity, Conservation and Attractions *Declared Rare and Priority Flora List for Western Australia* (as amended).

**targeted flora survey** means a field-based investigation, including a review of established literature, of the biodiversity of flora and vegetation of the permit area, focusing on habitat suitable for flora species that are being targeted and carried out during the optimal time to identify those species. Where target flora are identified in the permit area, the survey must also include a minimum of 10 metre radius of the surrounding area to place the permit area into local context.

**threatened flora** means threatened flora listed under the *Biodiversity Conservation Act 2016* within the *Wildlife Conservation (Rare Flora) Notice 2018* (as amended).

**weed/s** means any plant -

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



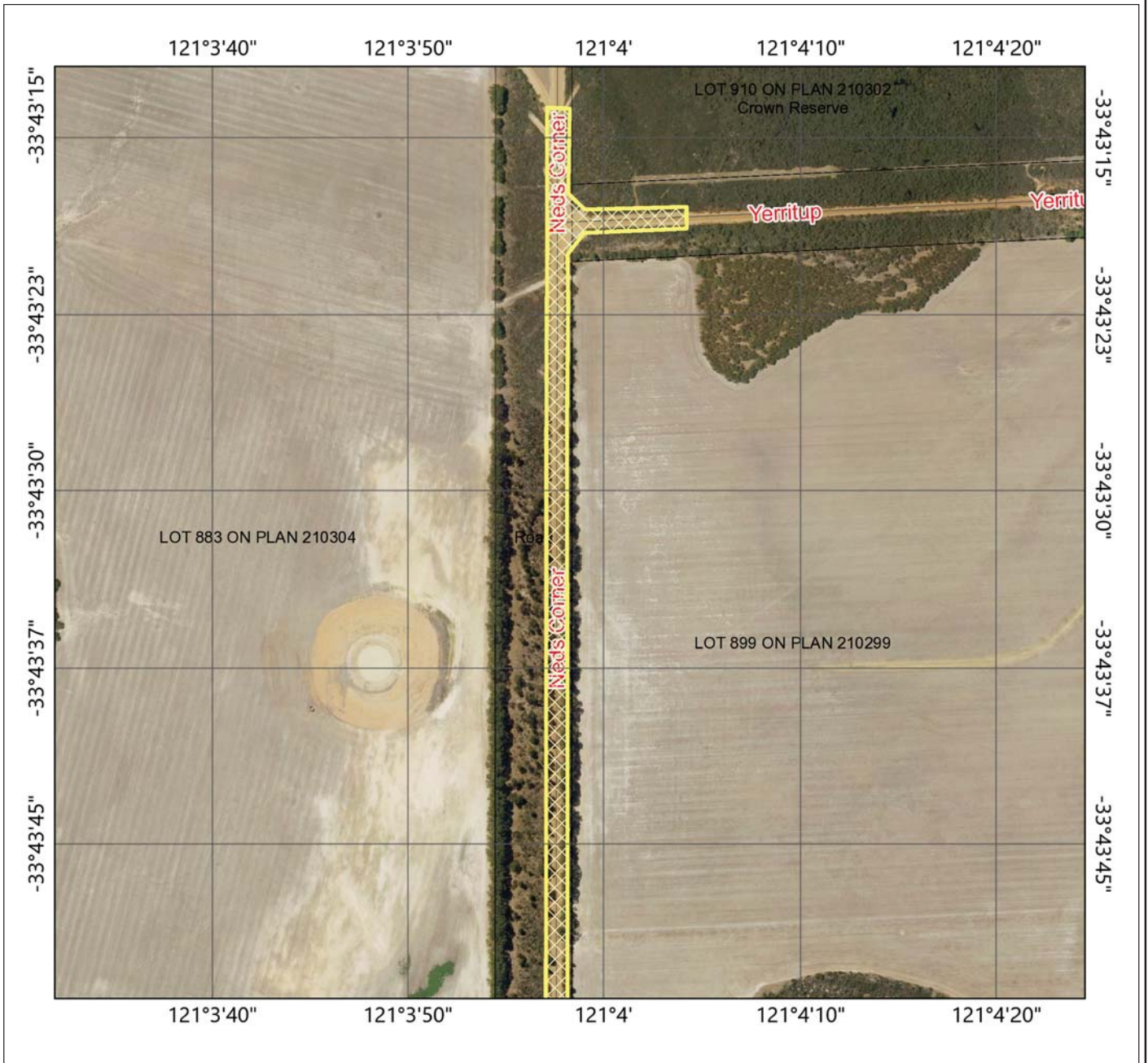
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Mathew Gannaway  
MANAGER  
NATIVE VEGETATION REGULATION

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

29 June 2020

# CPS 8400/1a




## Legend

- CPS areas approved to clear
- Roads - Minor Roads
- Cadastre

0.2                      0.11                      0.2 Kilometers



WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

  
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Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.

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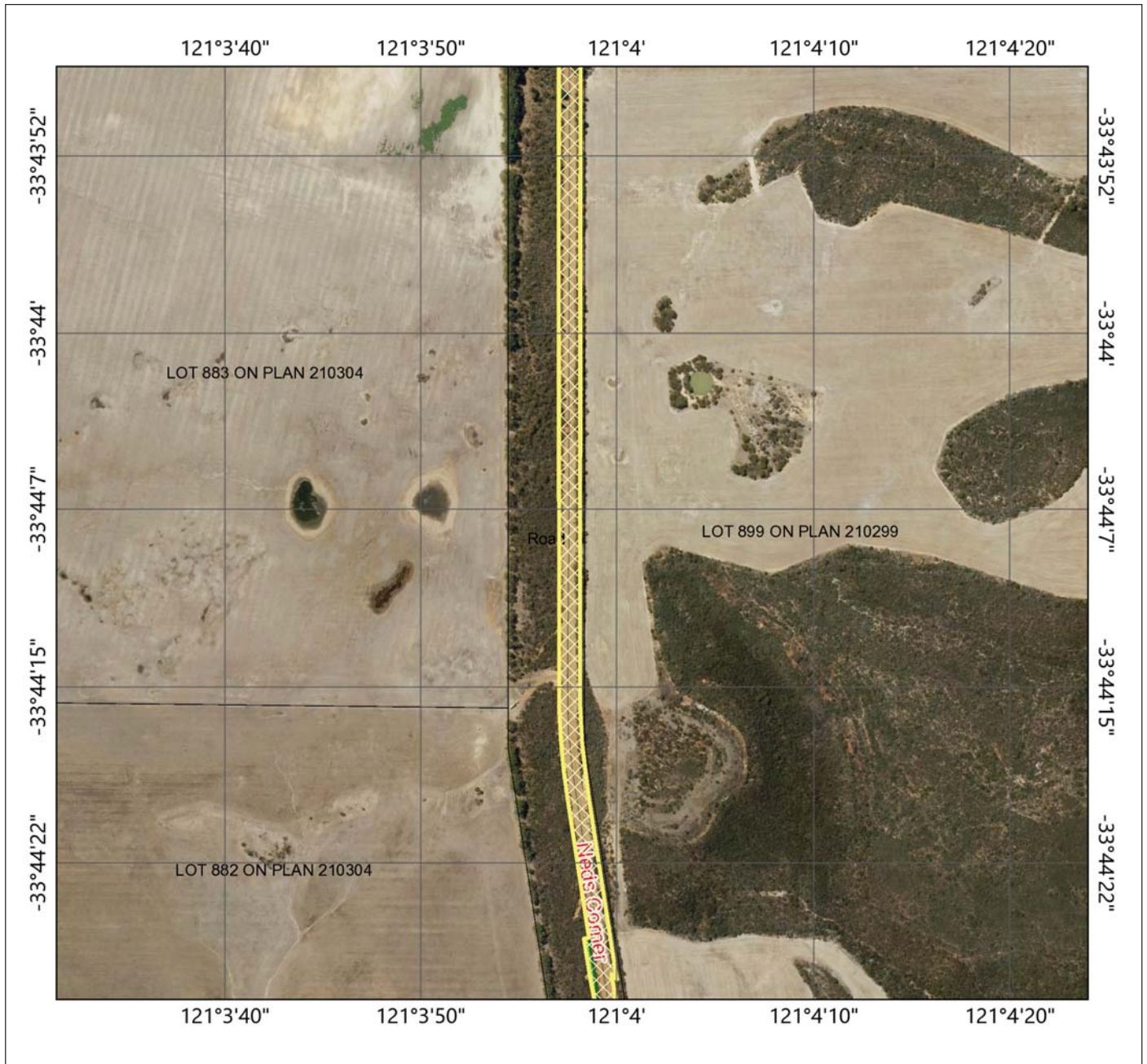
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## Locality Map



Government of Western Australia  
Department of Water and Environmental Regulation

# CPS 8400/1b



## Legend

- CPS areas approved to clear
- CPS subject to conditions
- Roads - Minor Roads
- Cadastre

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## Locality Map



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# CPS 8400/1c



## Legend

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- Roads - Minor Roads
- Cadastre

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## Locality Map



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# CPS 8400/1d



## Legend

- CPS areas approved to clear
- Roads - Minor Roads
- Cadastre

0.1                      0.03                      0.1 Kilometers



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## Locality Map



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# CPS 8400/1e



## Legend

- CPS areas approved to clear
- CPS subject to conditions
- Roads - Minor Roads
- Cadastre

0.1                      0.07                      0.1    Kilometers



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## Locality Map



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# CPS 8400/1f



## Legend

- CPS areas approved to clear
- CPS subject to conditions
- Roads - Minor Roads
- Cadastre

0.1                      0.07                      0.1    Kilometers



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## Locality Map



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# CPS 8400/1g



## Legend

- CPS areas approved to clear
- CPS subject to conditions
- Roads - Minor Roads
- Cadastre

0.1                      0.03                      0.1    Kilometers



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## Locality Map



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# CPS 8400/1h



## Legend

- CPS areas approved to clear
- CPS subject to conditions
- Roads - Minor Roads
- Cadastre

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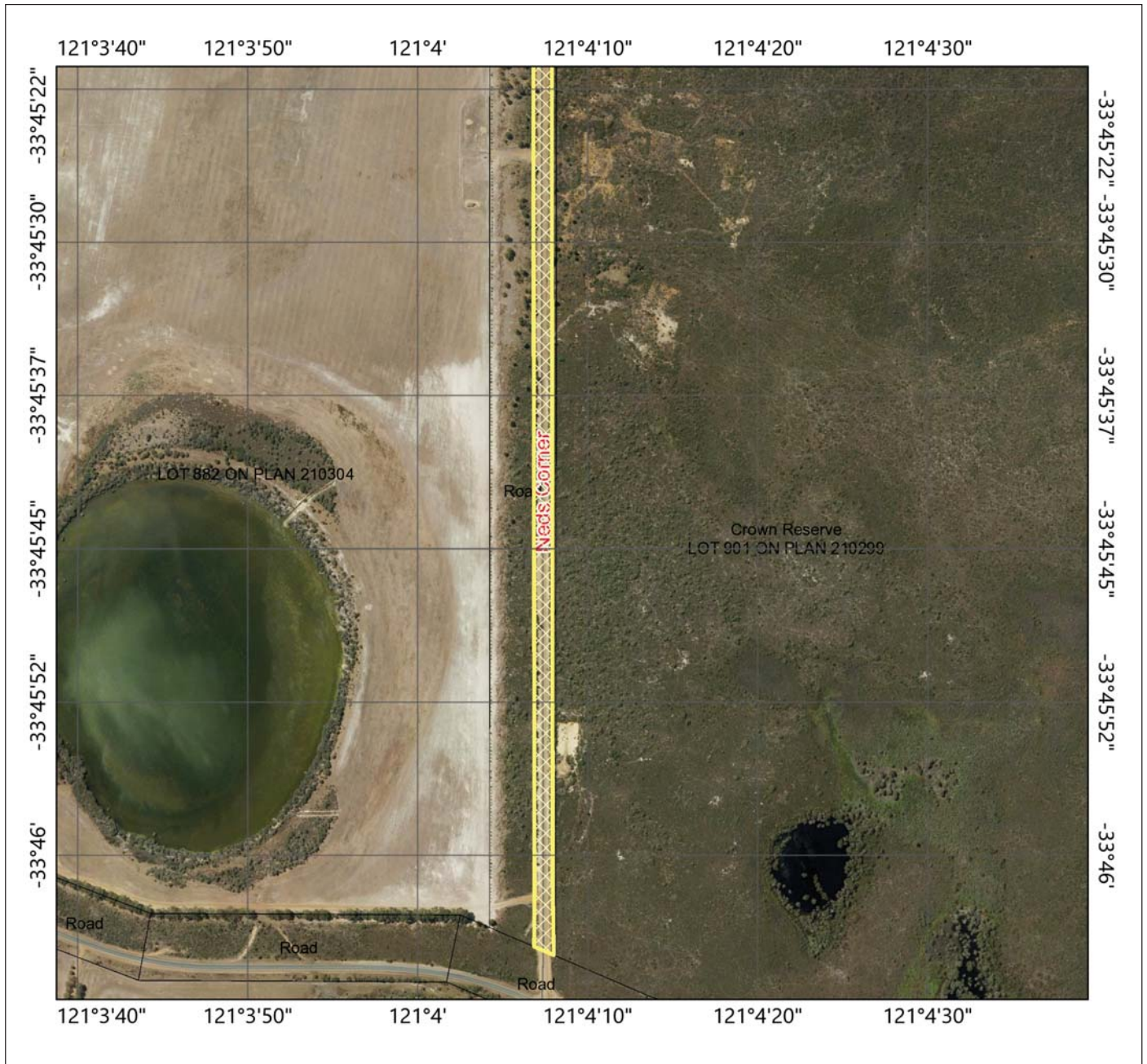
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## Locality Map



**Government of Western Australia**  
Department of Water and Environmental Regulation

# CPS 8400/1i




### Legend

- CPS areas approved to clear
- Roads - Minor Roads
- Cadastre

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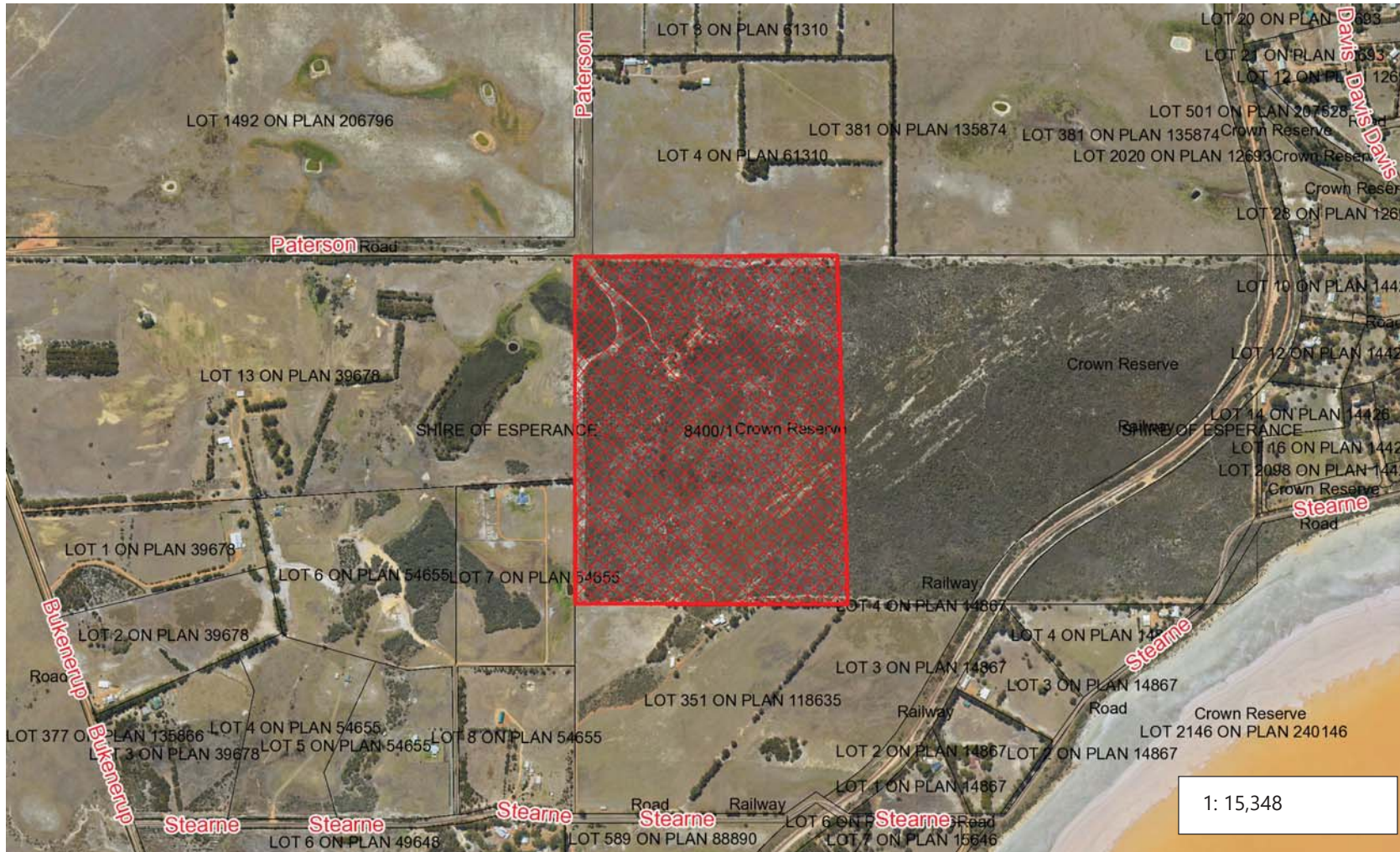
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### Locality Map




**Government of Western Australia**  
 Department of Water and Environmental Regulation

CPS 8400/1j



1: 15,348

Legend

- CPS subject to conditions
- Local Government Authorities
- Roads - Minor Roads
- Cadastre

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Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

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Kilometers  
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# Clearing Permit Decision Report

## 1. application details

### 1.1. Permit application details

Permit application No.: 8400/1  
Permit type: Purpose Permit

### 1.2. Applicant details

Applicant's name: Shire of Esperance  
application received date: 5 March 2019

### 1.3. Property details

Property: Neds Corner Road reserve (PIN: 11644162) and Yerritup Road reserve (PIN: 11644162)  
Local Government Authority: Shire of Esperance  
Localities: Coomalbidup

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
5.56	-	Mechanical Removal	Road construction or upgrades

### 1.5. Decision on application

Decision on Permit application: Grant  
Decision Date: 29 June 2020

**Reasons for Decision:** The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance with principles (a), (b) and (f) and is not likely to be or not at variance with the remaining principles.

The applicant has implemented or committed to a number of minimisation and mitigation measures, including the following:

- the design of the road re-alignment was altered to avoid and implement buffers for three out of five plants of Priority 1 flora species *Leucopogon* sp. Cascades (M. Hislop 3693) individuals; and
- material removed to form backslope in the construction process will be used as fill material further up the road project to minimise clearing required elsewhere to mine sand or gravel.

The Delegated Officer noted that whilst the project will be removing individuals of two additional priority flora, namely *Dampiera sericantha* and *Thomasia pygmaea*, due to their persistence in large numbers outside of the proposed clearing footprint, the potential impacts are unlikely to be considered significant.

Taking into account the above measures, the Delegated Officer considers that the following significant residual impacts remain:

- loss of 2.04 hectares of native vegetation that is representative of the federally listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia' (Kwongan Shrublands); and
- loss of 5.56 hectares of foraging and roosting habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*).

Consistent with the Western Australian Environmental Offset Policy (2011) and WA Environmental Offsets Guidelines (2014), and pursuant to section 51(2)(b) of the EP Act, in order to mitigate the significant residual impacts described above, the Permit Holder is required to provide an offset involving the acquisition and conservation of:

- 44.81 hectares of native vegetation representative of the federally listed Kwongan Shrublands TEC within Reserve 4181.

To minimise other potential impacts, as a condition of the clearing permit the applicant will be required to undertake the following measures:

- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- implement weed and dieback management measures to reduce the risk of spread, including:
  - cleaning machines of soil and vegetation before entering and leaving the application area

- prohibiting the movement of machines between dieback infested and non-infested areas until those machines have been cleaned of soil and vegetation
- ensuring that no known dieback or weed-affected soil, mulch, fill or other material is brought into the application area
- restricting the movement of machines and other vehicles to the limits of the areas to be cleared.
- undertake activities within three months of clearing to reduce the exposure time of bare sandy soils and minimise the risk of land degradation through wind erosion.

The Delegated Officer took into consideration that the road upgrades are required to improve road safety and to align with current road safety design standards.

In granting a clearing permit subject to the above requirements, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

## 2. Site Information

### Clearing Description

The application proposed to clear 5.4 hectares of native vegetation within a 15.23 clearing footprint area within Neds Corner Road Reserve (PIN: 11644163) and Yerritup Road Reserve (PIN: 11644162), Coomalbidgup (the application area), for the purpose of road construction. During assessment, the application area increased to 5.56 hectares within a 15.39 clearing footprint area to accommodate adequate buffers to priority flora *Leucopogon* sp. Cascades (M. Hislop 3693) individuals (Figure 1).

### Vegetation Description

The application area is mapped in the 'Esperance Plains' region of the Interim Biogeographic Regionalisation for Australia (IBRA), and is mapped as the following Beard vegetation associations (Shepherd et al., 2001):

- 47 (approximately 57 per cent of the application area) described as Shrublands; tallerack mallee-heath;
- 516 (approximately 37 per cent of the application area) described as Shrublands; mallee scrub, black marlock; and
- 4048 (approximately 6 per cent of the application area) described as Shrublands; scrub-heath in the Esperance Plains including Mt Ragged scrub-heath.

A flora and vegetation survey (the flora survey) conducted in April 2019 by the applicant mapped the application area as comprising of the following vegetation associations (Shire of Esperance, 2019a):

- Scattered *Nuytsia floribunda* and *Eucalyptus pleurocarpa* overstorey with dense heathland midstorey, with dominant *Calothamnus quadrifidus*. Overstorey *Callitris* sp., *Eucalyptus pleurocarpa*, *Nuytsia floribunda*, *Hakea trifurcata* and *Lambertia inermis*. Midstorey dominant *Calothamnus quadrifidus* with *Melaleuca* sp., *Acacia cyclops* and *Xanthorrhoea platyphylla*. Understorey *Caustis dioica*, *Lepidosperma* sp. and *Synaphea* sp.;
- *Banksia speciosa* and *Eucalyptus* overstorey with dense *Melaleuca* midstorey and dense sedgeland understorey. Overstorey dominant of *Banksia speciosa*. Midstorey dominant of *Melaleuca striata*, *Conospermum* sp., *Adenanthos cuneatus*, *Lambertia inermis*. Understorey of *Caustis dioica* and *Anarthria scabra*;
- Scattered mixed *Eucalyptus* dominant overstorey with dense dominant *Banksia armata*. Interspersed between dense *Banksia armata* is *Hakea marginata*, *Acacia chrysocephala*, *Cassytha* sp., *Gastrolobium spinosum*, *Hakea corymbosa*;
- Dense *Eucalyptus* overstorey, with scattered shrubland midstorey. Observed species in midstorey include *Acacia cyclops*, *Calothamnus quadrifidus*, *Banksia armata*, *Hakea trifurcata*, *Acacia gonophylla*, *Kennedia* sp.;
- Dense *Eucalyptus* woodland overstorey. Different to above, with more diversity in midstorey. Species in midstorey include *Kennedia* sp., *Melaleuca* sp., *Xanthorrhoea platyphylla*, *Acacia glaucoptera*, *Hakea corymbosa*, *Acacia cyclops*; and
- Scattered *Eucalyptus pleurocarpa* overstorey, with dominant *Allocasuarina* sp. and Myrtaceae midstorey.

### Vegetation Condition

The condition of the vegetation within the application area is considered to range from Completely Degraded to Very Good, described as:

- Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate (Keighery 1994).



- Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management (Keighery 1994).
- Completely Degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery, 1994).

The vegetation condition was determined by the flora survey (Shire of Esperance, 2019a). The majority of the vegetation within the application area is in Very Good condition.

**Soil type**

The application area is mapped as the following land subsystems (Northcote et al., 1960-1968):

- Munglinup 1 Subsystem (approximately 40 per cent of the application area) is described as externally drained plains and rises with gently inclined slopes some small level plains on upper slopes and catchment divides. Grey deep and shallow sandy duplex (gravelly) minor pale deep sands and gravelly duplex and deep sandy gravels;
- Young 1 Subsystem (approximately 30 per cent of the application area) is described as Soil complex dominated by yellow to red solonetzic soils, on sloping valley sides; and
- Esperance 1 Subsystem (approximately 30 per cent of the application area) is described as Gravelly yellow mottled duplex soils (<30 cm sand over gravel).

**Comments**

The local area considered in the assessment of this application is defined as a 20 kilometre radius measured from the perimeter of the application area.

The federally listed TEC 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' is hereon referred to as Kwongkan Shrublands.

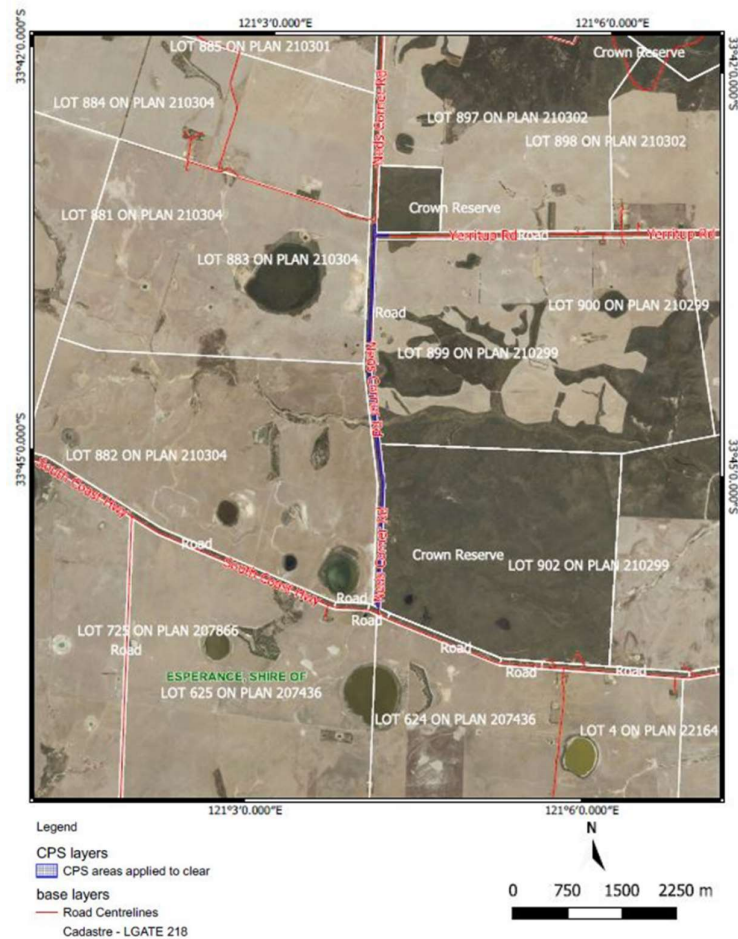


Figure 1: Application area cross hatched in blue

**3. Minimisation and mitigation measures**

The Shire of Esperance advised that “If the existing road width (currently single width bitumised area, including spoon drains and backslope) footprint was wide enough to allow road reconstruction without clearing, then this would be the preferred method and avoid vegetation clearing. However, the current road width is 22 metres and 28 metres is required for double-lane roads to meet

safety requirements with appropriate spoon drain and backslope width. No excessive widening that is un-needed for road construction will occur, minimising the clearing of vegetation” (Shire of Esperance, 2019b).

Consideration of fill material to build the road also included avoiding and minimising vegetation clearing. For example, material removed to form backslope in the construction process will be used as fill material further up the road project, minimising clearing required elsewhere to mine sand or gravel (Shire of Esperance, 2019b).

A targeted flora survey identified Priority 1 flora species *Leucopogon* sp. Cascades (M. Hislop 3693) within the application area (Shire of Esperance, 2019c). Under the recommendation of Department of Biodiversity, Conservation and Attractions (DBCA) (DBCA, 2020), the applicant implemented buffers to avoid a number of individuals to reduce impact to this species, which involved altering the design of the road re-alignment (Shire of Esperance, 2020).

#### **4. Assessment of application against clearing principles**

##### **(a) Native vegetation should not be cleared if it comprises a high level of biodiversity.**

##### **Proposed clearing is at variance with this Principle**

According to available databases, two threatened and seventeen priority flora species have been recorded within the local area. Threatened flora are discussed further under Principle (c). Of the seventeen priority flora, the following eight priority flora species may occur within the application area (Shire of Esperance, 2019a):

- *Cyathostemon* sp. Esperance (P1) inhabits sandy gravel, sandy clay, loam soils and is typically associated with saline depressions, near salt pans, lake margins (Strategen Environmental (2018)). The species is known from one record located more than 76 kilometres southwest from the application area, however, Shire of Esperance (2019a) advised that because of limited information available about this species, it may occur within the application area.
- *Leucopogon* sp. Cascades (M. Hislop 3693) (P1) is an erect shrub 70 centimetres high. The species occupies dry, brown, sandy soils and is typically associated with Mallee woodland with associated vegetation: *Melaleuca* sp., *Grevillea oligantha* and *Styphelia intertexta* (Western Australian Herbarium, 1998-). The species is known from four records from Shire of Coolgardie, Shire of Dundas and Shire of Yilgarn. One individual of this species has been recorded within the application area.
- *Thysanotus brachiatus* (P2) is a rhizomatous, leafless perennial herb, to 0.3 metre high known from 11 records. This species tends to inhabit grey sandy soils (Western Australian Herbarium, 1998-). The closest record of this species is recorded approximately 20.8 kilometres southwest of the application area, but according to the flora survey (Shire of Esperance, 2019a), it may occur within the application area.
- *Dampiera sericantha* (P3) is an erect, slender perennial herb, 0.05-0.3(-0.6) metre high that occupies sand and sometimes gravelly soils (Western Australian Herbarium, 1998-). The species is known from 26 records. Three of these records have been recorded within the local area, with the closest species being recorded approximately 750 metres south from the application area.
- *Daviesia pauciflora* (P3) is a diffuse, many-stemmed shrub, 0.3-0.8 metre high known from 25 records. The species inhabits white or grey sand over laterite of limestone and flowers from October to December or January (WA Herbarium, 1998). One species have been recorded within the local area located approximately 12.2 kilometres west from the application area.
- *Hopkinsia adscendens* (P3) is a rhizomatous, perennial, herb, to 0.4 m high associated with sandy soils and usually occurs on dry or seasonally damp habitats along streams (Western Australian Herbarium, 1998-). The species is known from 10 records, with one record being recorded within the local area located approximately 17 kilometres east of the application area.
- *Leucopogon blepharolepis* (P3) is an erect slender shrub, 0.2-1.2 metre high known from 30 records. The species inhabits white/grey sand, calcareous sand, sandy clay over quartzite and is associated with sandy ridges, sandplains or hills. There are four records recorded within the local area, with the closest record located approximately 9.6 kilometres southeast of the application area.
- *Thomasia pygmaea* (P3) is a low shrub, 0.05-0.3 metre high growing on stony sandy loam, clayey sandy soils. The species tends to grow on marine plains (Western Australian Herbarium, 1998-). The species is known from 9 records. There have been recorded 3 records of this species within the local area, with the closest record located approximately 5.8 kilometres east of the application area.

The flora survey (Shire of Esperance, 2019a) submitted in support of this application was conducted in April 2019. The survey defined the vegetation communities present, which was used to guide what conservation significant flora is likely to occur. It was noted at the time of the survey that there was minimal flora species in flower. A targeted flora survey conducted in spring, when the majority of conservation significant flora species mentioned above are flowering, was required to determine the impacts of the proposed clearing to conservation significant flora.

The Department of Water and Environmental Regulation (DWER) wrote to the applicant on 4 September 2019 outlining that a flora and vegetation survey was required to be undertaken during spring flowering season. In response to DWER's correspondence, the applicant undertook a spring flora and vegetation survey over the application area. The report following this survey (Shire of Esperance, 2019c) was provided to DWER in support of the clearing permit.

The survey identified 300 flora species within the application area. Of these species, three have a priority conservation ranking: *Leucopogon* sp. Cascades (Priority 1), *Dampiera sericantha* (Priority 3) and *Thomasia pygmaea* (Priority 3). No threatened flora species were recorded during the survey (Shire of Esperance, 2019c).

Priority 1 flora species *Leucopogon* sp. Cascades (M. Hislop 3693) was identified along the 1.3 km transect (Shire of Esperance, 2019c). Five plants were recorded, with two plants present in the backslope active footprint of the road. The two plants within the backslope will likely be impacted during routine road maintenance operations, however, the other three plants will not be

impacted upon and are outside the area of the proposed road reconstruction (Shire of Esperance, 2019c). One plant was recorded at 2.4 km north of South Coast Highway, on Neds Corner Road, and will be impacted by the proposed clearing. Two plants were recorded 3 km north of South Coast Highway, on Neds Corner Road, which are within the proposed road widening footprint. Noting this, a total of five individuals are proposed to be impacted from the proposed clearing.

Two populations of Priority 3 flora species *Dampiera sericantha* were recorded within the survey area, from the intersection of South Coast Highway to 500 m north, and at 1.6 km north, on Neds Corner Road (Shire of Esperance, 2019c). Across both populations, an estimate of 350 to 450 plants were recorded, and of these approximately 112 plants will be impacted upon by the proposed clearing (Shire of Esperance, 2019c). The occurrence of *D. sericantha* demonstrated that the species is a disturbance opportunist, with large numbers monopolizing areas in the graded road area, while some were present in a historical sand extraction site as well as in spoon drains (Shire of Esperance, 2019c). Due to this, there is a potential that this species will persist in the newly constructed spoon drains and back slopes following the completion of the proposed road works.

Two populations of Priority 3 flora species *Thomasia pygmaea* were recorded within the survey area, located from 1.9 km to 2.9 km, and 3 to 3.8 km north of South Coast Highway, on Neds Corner Road (Shire of Esperance, 2019c). A total estimate of 100 to 200 plants was observable from the survey, and an estimated 50 plants will be impacted by the proposed clearing (Shire of Esperance, 2019c). This species was closely associated with the mixed dense *Eucalyptus* mallee along the river corridor, and given that adjacent to the recorded populations is a reserve of approximately 1,000 hectares with river tributaries extending through, it is likely that there are larger population numbers than what was recorded during the survey (Shire of Esperance, 2019c).

No other priority flora species were recorded within the application area. Considering that the targeted flora survey was conducted mid-spring when the vast majority of the species were flowering and a follow up survey occurred in November 2019 with members of the Esperance Wildflower Society (Shire of Esperance, 2019c), the survey is considered to be adequate in capturing the flora species occurring within the application area.

DWER sought advice from DBCA in relation to the potential impact of the proposed clearing on the priority flora identified from the survey. DBCA advised that the potential impacts to *Dampiera sericantha* and *Thomasia pygmaea* are unlikely to be considered significant (DBCA, 2020). *D. sericantha* was recorded in high numbers and majority will remain, and *T. pygmaea* has a large range and number locations, approximately 50 – 75 per cent of the known population occurs outside of the application area (DBCA, 2020). Due to *Leucopogon* sp. Cascades (M. Hislop 3693) being highly restricted and poorly known, impacts are likely to be significant and DBCA recommended that where possible, to avoid the clearing of plants and implement suitable vegetative buffers (DBCA, 2020). The applicant was advised of this and the design of the road re-alignment was altered to avoid and implement buffers for three out of five plants, with the remaining two being unavoidable (Shire of Esperance, 2020). As a result of this, the area proposed to be cleared increased slightly. As a condition of the permit, the applicant is not allowed to clear the areas added from the re-alignment until a flora survey is undertaken and results provided to DWER. If additional priority flora are identified within the re-alignment area following the survey, clearing of priority flora is not able to occur until an additional risk assessment is conducted by DWER through an amendment application. Given the avoidance of three *Leucopogon* sp. Cascades (M. Hislop 3693) individuals and further work involved in the design of the road re-alignment, it is considered that the applicant's minimisation measures in relation to the impact to this species are adequate.

As discussed in Principle (b), the application area is considered to contain significant foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act).

As discussed in Principle (c), the survey did not record any threatened flora species occurring within the application area during a survey undertaken at an appropriate time for the region (Shire of Esperance, 2019c).

The application area is mapped within an occurrence of the Kwongkan Shrublands, a federally listed TEC. This TEC is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This TEC is predominantly located within the Esperance Sandplains and Mallee bioregions, and typically occurs on sandplains where rainfall ranges from 400 to 800 millimetres a year. The Kwongkan Shrublands comprises of shrublands dominated by plants from the family Proteaceae, including plants from the genera *Adenanthos*, *Banksia*, *Grevillea*, *Hakea*, *Isopogon* and *Lambertia* (Threatened Species Scientific Committee (TSSC), 2014). According to conservation advice produced by the TSSC, this TEC is characterised by a 30 per cent or greater cover of Proteaceae species across all layers where they occur or, in disturbed areas, containing two or more diagnostic Proteaceae species that are likely to form a significant vegetated component when regenerated (TSSC, 2014).

The flora survey conducted by the Shire of Esperance (2019a) identified that the proposed clearing will result in the loss of 2.04 hectares of the Kwongkan Shrublands. The remaining vegetation within the application area does not meet criteria of this TEC. Of the 2.04 hectares, 0.642 hectares is in degraded, 0.2 hectares in good and 1.237 hectares in very good condition (Shire of Esperance, 2019a). The proposed clearing of up to 2.04 hectares of the Kwongkan Shrublands represents a relatively small proportion of its current extent, however, cumulative impacts to the federally listed TEC are considered significant, incremental, and ongoing.

The disturbance caused by the proposed clearing may impact adjacent native vegetation through an increase of weeds and dieback. Weed and dieback management practices will assist in mitigating this risk.

Given that the application area includes conservation significant flora, significant foraging habitat for Carnaby's cockatoo, and Kwongkan Shrublands TEC, the proposed clearing is at variance with this Principle. It is considered that the proposed impacts to significant habitat for Carnaby's cockatoo and the Kwongkan Shrublands TEC are of a scale that can be offset through the offset proposed by the applicant. Further details on the offset are provided in Section 5.

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.**

**Proposed clearing is at variance with this Principle**

According to available databases, one Priority 1, three Priority 4, 17 protected under international agreement, one other specially protected and 10 threatened fauna species have been recorded within the local area. Of these species, the application area is likely to provide potential habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), listed as Endangered under the EPBC Act and the BC Act.

Carnaby's cockatoo nests in hollows in live or dead trees of wandoo, York gum, salmon gum, powderbark wandoo (*Eucalyptus accedens*), marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), flooded gum (*Eucalyptus rudis*), tuart (*Eucalyptus gomphocephala*) and karri (*Eucalyptus diversicolor*) (Commonwealth of Australia, 2012). This species forages on the seeds, flowers and nectar of native proteaceous plant species (e.g. *Banksia*, *Hakea* and *Grevillea* species), *Eucalyptus* and *Callistemon* species (Commonwealth of Australia, 2012). The flora survey (Shire of Esperance, 2019a) identified that there are multiple areas of scattered Kwongkan Shrublands within the application area, which is considered foraging habitat. In areas without Kwongkan Shrublands, large tuart trees and scattered pine trees are present, which would be suitable for roosting and feeding. The applicant advised that minimal vegetation consisting of foraging material will be removed and where possible and feasible, the large potential roosting trees will be avoided (Shire of Esperance, 2019a).

Carnaby's cockatoo has been significantly impacted by historical clearing of its habitat and as a result it is estimated that this species has disappeared from more than one-third of its historical breeding range (EPA, 2019). Broad-scale clearing of native vegetation has resulted in fragmentation of breeding and foraging habitat, loss of breeding hollows, changes in the species distribution, and genetic partitioning (EPA, 2019). The EPA's technical guidance notes that "this species is reliant on the maintenance of resources over multiple bioregions, which adds an extra complexity to its conservation. To address this, mitigation must be applied across the species range" (EPA, 2019). Noting this, it is considered that the remaining suitable habitat for this species within its current range is likely to be significant.

While the proposed clearing of up to 5.56 hectares of Carnaby's cockatoo habitat represents a relatively small proportion of its current extent, the cumulative impacts to Carnaby's cockatoo habitat are considered significant, incremental, and ongoing. The vegetation within the application area is considered to be significant habitat for Carnaby's cockatoo due to the dominance of native proteaceous plant species which are a preferred foraging species and the Very Good to Good condition of majority of the vegetation.

Ecological linkages are a series of non-contiguous natural areas that connect larger natural areas by forming stepping stones through the altered landscape that allows the movement over time of organisms between these larger areas and across the landscape.

The application area is within Strategic Zone A of the Western Australian South Coast Macro Corridor Network, which was designed to identify a regional-scale Macro Corridor Network of native vegetation, which extends from around 700 kilometres from Israelite Bay, east of Esperance and westwards through Albany along Western Australia's southern coastline (CALM, 2006). The vegetation within Zone A is considered to potentially form the most strategic link between major protected areas, and are thus of potentially higher value and significance for fauna movement across the landscape (CALM, 2006). While the proposed clearing will impact on vegetation recognised for its importance as a fauna corridor, noting that the proposed clearing will not sever the corridor, impacts to the ecological linkage are not expected to be significant.

Given that the application area contains significant habitat for Carnaby's cockatoo, the proposed clearing is at variance with this Principle. It is considered that the proposed impacts to significant habitat for Carnaby's cockatoo are of a scale that can be offset through the offset proposed by the applicant. Further details on the offset are provided in Section 5.

**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.**

**Proposed clearing is not likely to be at variance with this Principle**

According to available databases, two threatened flora species have been recorded within the local area:

- Sedge Conostylis (*Conostylis lepidospermoides*): a rhizomatous, sedge-like, tufted perennial herb found from east of Ravensthorpe northwards to Ninety Mile Tank, a range of about 120 kilometers. The species grows in flat or gently undulating plains, in yellow or grey sand over laterite or clay. It inhabits low heath and sedge communities with scattered emergent chittick, *Banksia media*, tallerack and other mallees. This species flowers from September to October. Although widespread, most populations are small and confined to road reserves alongside cleared farmland (Brown et al., 1998). The closest species has been recorded approximately 16.5 kilometres north of the application area.
- Small Two-coloured Kangaroo Paw (*Anigozanthos bicolor* subsp. *minor*): a small rhizomatous herb with flattened leaves 5-10 cm long and hairy flowers held on scapes 5-20 cm high. The species grows in moist sandy soil in heath communities and in shallow soils over granite. Habitat critical to survival is moist sandy soil in heath communities and shallow soils near granite outcrops and additional occurrences of similar habitat that do not currently contain the species but may have done so in the past and may be suitable for translocations. (Department of Environment and Conservation, 2008). The closest Small Two-coloured Kangaroo Paw has been recorded approximately 9.5 kilometres southwest of the application area.

Noting that the application area does not contain seasonally damp springs on granite outcrops, *Anigozanthos bicolor* subsp. *minor* is not likely to occur in the application area.

The flora survey (Shire of Esperance, 2019a) identified that *Conostylis lepidospermoides* may occur within the application area. DBCA (2019) advised that a spring flora survey of the application area is required to determine the impacts to this threatened flora species. A spring survey undertaken by the applicant did not record any threatened flora species occurring within the application area (Shire of Esperance, 2019c). Considering the survey was undertaken at an appropriate time for the region, the survey is considered to be adequate in capturing the flora species occurring within the application area. Due to the absence of *Conostylis lepidospermoides*, it is unlikely that the proposed clearing will impact this species.

Given the above, the proposed clearing is not likely to be at variance with this Principle.

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

**Proposed clearing is not likely to be at variance with this Principle**

According to available databases, no state listed TECs are mapped within the local area and application area. The flora survey did not identify any state listed TECs within the application area (Shire of Esperance, 2019a).

Given the above, the proposed clearing is not likely to be at variance with this Principle.

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

**Proposed clearing is not likely to be at variance with this Principle**

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-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is located within the 'Esperance Plains' Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This IBRA bioregion has approximately 51 per cent of its Pre European vegetation extent remaining (Government of Western Australia, 2019).

The application area is also mapped in the following Beard Vegetation Associations in Esperance Plains Bioregion:

- 47 which is mapped across approximately 57 per cent of the application area, and retains approximately 35.05 per cent pre-European vegetation;
- 516 is mapped across approximately 37 per cent of the application area, and retains approximately 68.96 per cent pre-European vegetation; and
- 4048 is mapped across approximately 6 per cent of the application area, and retains approximately 49.85 per cent pre-European vegetation extent.

The local area retains approximately 31 per cent of its pre-European vegetation extent.

Given the above, the proposed clearing is not likely to be at variance with this Principle.

**Table 1: Vegetation extent statistics (Government of Western Australia, 2019)**

	Pre-European extent (ha)*	Current extent (ha)*	Extent remaining (%)*	Current extent in all DBCA managed lands (ha)*	Extent remaining in all DBCA managed lands (proportion of Pre-European extent) (%)*
<b>IBRA bioregion</b>					
Esperance Plains	2,899,940.66	1,494,450.87	51.53	822,666.27	28.37
<b>Beard Vegetation Association in Esperance Plains Bioregion</b>					
47	959,935.91	336,492.07	35.05	178,325.54	18.58
516	318,746.74	219,798.44	68.96	91,559.83	28.72
4048	39,025.62	19,454.16	49.85	12,949.75	33.18

\*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, Perth.

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Proposed clearing is at variance with this Principle**

According to available databases, Yerritup Creek is mapped as intersecting the application area in its central portion. This watercourse was also observed during the flora survey (Shire of Esperance, 2019a). The survey found that the vegetation surrounding the creek-line is already extremely degraded, with dominance of invasive weeds that have suffocated the native vegetation. Invasive weeds present included Thistles, Sunflowers, Kikuyu grass, Couch grass, African Lovegrass, Rose Pelargonium and Sorrel (Shire of Esperance, 2019a).

As part of the proposed clearing is growing in or in association with a watercourse or wetland, the proposed clearing is at variance with this Principle. Due to the application area being located adjacent to an existing road with culverts and drainage infrastructure and the vegetation surrounding the creek is in completely degraded condition (Keighery, 1994), the proposed clearing is not likely to have a significant impact upon riparian vegetation.

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

**Proposed clearing is not likely to be at variance with this Principle**

Primary soils within the application area are mapped by the Department of Primary Industries and Regional Development (DPIRD) (2018). The three mapped soils within the application area are Munglinup 1 Subsystem (approximately 40 per cent of the application area), Young 1 Subsystem (approximately 30 per cent of the application area), and Esperance 1 Subsystem (approximately 30 per cent of the application area) (Northcote et al., 1960-68). Table 2 categorises the land degradation risk for each subsystem.

**Table 2 Risk degradation summary**

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

Munglinup 1 Subsystem is predominant within the application area and has a moderate to high salinity risk or is presently saline, and approximately half of this subsystem has a high subsurface acidification risk or is presently acidic. Esperance 1 Subsystem covers approximately 30 per cent of the application area and has a high subsurface acidification risk or is presently acidic. The proposed clearing is not anticipated to involve deep soil disturbance and risk impacting acid sulfate soils.

The topography of the application area is very flat and the average annual rainfall is 500 millimetres. Groundwater salinity within the application area has been mapped as 3000-7000 milligrams per litre total dissolved solids. Given the topography of the application area, the porous nature of sandy soils within the application area, the linear shape and size of the application area, and relatively low rainfall, the proposed clearing is unlikely to cause appreciable land degradation through subsurface acidification, water erosion, waterlogging or salinity.

The abovementioned mapped soil types have a high to extreme wind erosion risk. However, noting the linearity of the application area and that the soils will be exposed on a short term basis with cleared areas to be covered by bitumen and gravel, any wind erosion is likely to be minimal given that soil exposure is short term. As a condition of the permit, the applicant will be required to commence road upgrade activities within three months of clearing. The proposed clearing is not likely to cause significant wind erosion.

Noting the above, the proposed clearing is not likely to result in appreciable land degradation and the proposed clearing is not likely to be at variance with this Principle.

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

**Proposed clearing is not at variance with this Principle**

According to available databases there are five conservation areas within the local area:

- Stokes National Park Conservation Commission of WA (Class A) located approximately 6.5 kilometres south of the application area;
- Lake Shaster Nature Reserve Conservation Commission of WA located approximately 9.2 kilometres southwest of the application area;
- Springdale Nature Reserve located approximately 11.3 kilometres southwest of the application area;
- Munglinup Nature Reserve located approximately 15.5 kilometres west of the application area; and
- an un-named Crown land (PIN 993591) located approximately 18.5 kilometres southwest of the application area.

Given the distance to these conservation areas, and that there are no linkage values between conservation reserves and the application area, it is unlikely that the proposed clearing will impact on the environmental values of any conservation areas.

Given the above, the proposed clearing is not at variance with this Principle.

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

**Proposed clearing is not likely to be at variance with this Principle**

According to available databases, one watercourse (Yerritup creek) has been mapped within the application area. The proposed clearing may impact on surface water quality in the vicinity of this watercourse. While the proposed clearing may increase sedimentation and runoff into the watercourse, the impacts are likely to be minimal and short term and are not likely to cause deterioration in the quality of surface water.

Groundwater salinity mapped within the application area is mapped between 3000-7000 milligrams per litre total dissolved solids, which is considered to be saline. Given the linear shape and size of the application area and the mapped soil types within the application area, the proposed clearing is not likely to cause deterioration in the quality of underground water in the form of salinity.

Given the above, the proposed clearing is not likely to be at variance with this Principle.

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Proposed clearing is not likely to be at variance with this Principle**

As discussed in Principle (f), Yerritup creek has been mapped within the application area. The Shire of Esperance (2019a) advised that the road in this area has been designed with large drainage pipes and shaped to allow for water flow across the road if the creek rises during a flooding event. The road construction design has therefore been purposefully engineered to prevent disrupting natural hydrological regimes. The Shire of Esperance further advised that this would continue to be a consideration during the re-construction and widening phase, with minimal impact on the hydrological flow and course from what has already been historically impacted (Shire of Esperance, 2019a). The applicant proposes to conduct all works during dry soil conditions, without flowing water (Shire of Esperance, 2019a).

As discussed in Principle (g), the soils within the application area range from grey deep and shallow sandy duplex deep sands through solonetzic soils to sand over gravel. The degradation risk summary for these subsystems notes that less than three per cent of these map units has a moderate to high flood risk.

Noting the above and the extent of the proposed clearing, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance with this Principle.

**Planning instruments and other relevant matters.**

DWER sought advice from DBCA in relation to the proposed clearing. DBCA advised (DBCA, 2019):

- A targeted flora survey of the proposed site should be conducted to ensure threatened and priority flora are not impacted;
- All overburden material, (soil and vegetation), not be pushed into heaps within the vegetation corridor outside the clearing zone;
- Any work involving soil movement has the potential to introduce and spread dieback. The Shire should work within recommended dieback management guidelines to prevent or limit the risk of dieback introduction or spread; and
- The same principle as above applies to weed management to limit the introduction or spread of weeds across disturbed soil areas.

These recommendations have been addressed by the targeted flora survey (Shire of Esperance, 2019c) and placing management conditions on the permit.

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 19 March 2019 with a 21 day submission period. No public submissions have been received in relation to this application.

**5. Suitability of Proposed Offset**

After avoidance, minimisation and mitigation (outlined in Section 3 of this report), it is considered that the proposed clearing will result in the significant residual impacts below:

- loss of 2.04 hectares of native vegetation that is representative of the federally listed Kwongkan Shrublands TEC; and
- loss of 5.56 hectares of foraging and roosting habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*).

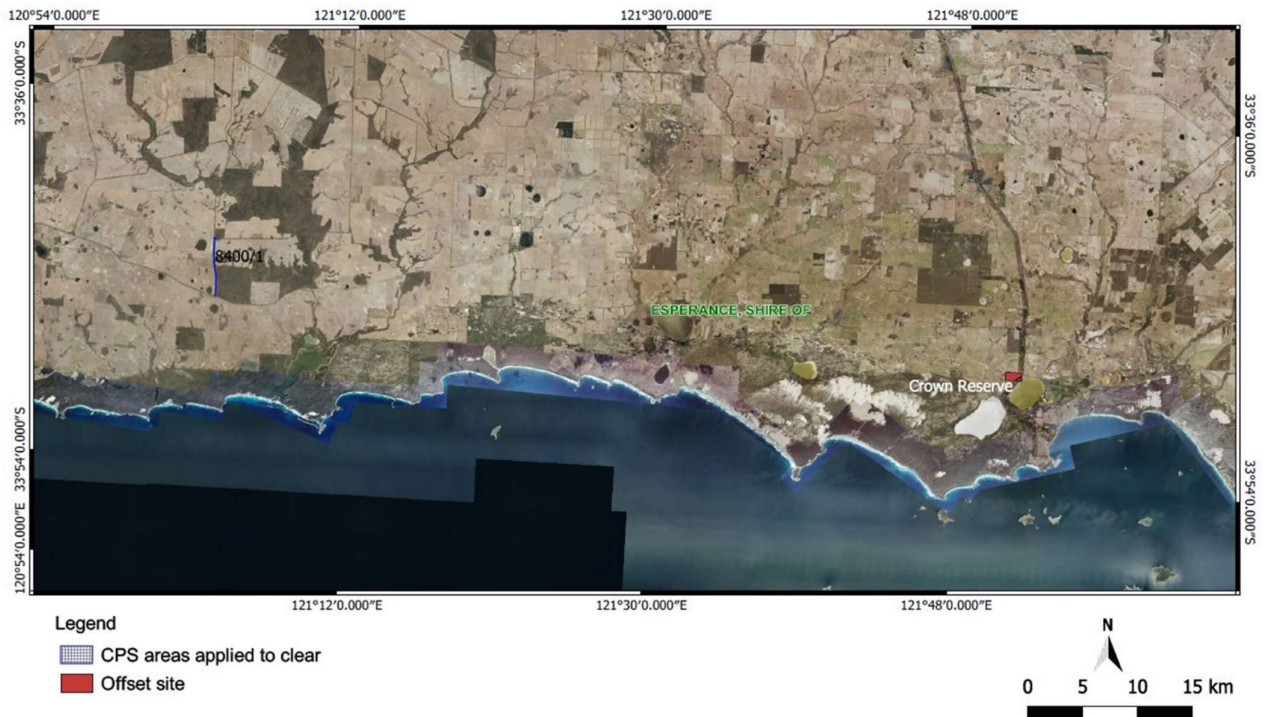
To counterbalance the significant residual impacts, the applicant submitted an offset proposal that involves changing the vesting of a common reserve to conservation for management in perpetuity.

In assessing whether the proposed offset is adequately proportionate to the significance of the environmental values being impacted, DWER undertook a calculation using the Department of Agriculture, Water and Environment (DAWE) Offsets Assessment Guide 'calculator'. The calculator indicated that the allocation of 44.81 hectares of Very Good to Excellent vegetation within Reserve 4181 is adequate to counterbalance the significant residual impacts upon 2.04 hectares of Kwongkan Shrublands and 5.56 hectares of Carnaby's cockatoo habitat from the proposed clearing.

Justification used for values in the offsets calculator for Reserve 4181 can be found in Appendix 1. This is consistent with the WA Environmental Offsets Policy September 2011.

The remaining habitat within Reserve 4181 may be banked for future authorised clearing. It should be noted that use of the banked offset sites will not be automatically accepted in every instance. In each case, the Shire must demonstrate how the offset counterbalances the significant residual impacts of the associated clearing.

The location of the reserve to be used as an offset site is shown in Figure 4, in context of the application area.



**Figure 4: Offset site (shaded in red) in context of application area (outlined in blue)**

Figure 5 below illustrates the remaining banked offset in reference to the offset site associated with counterbalancing the significant residual impacts upon Carnaby's cockatoo foraging habitat and Kwongkan Shrublands from the proposed clearing. The 44.81 hectare offset, in addition to the remaining banked portion (64.91 ha), will be recorded in the WA Offsets Register. It should be noted that the vegetation within this banked offset is in Very Good to Excellent condition and contains vegetation mapped as Beard vegetation association 7048: banksia scrub-heath on coastal plain in the Esperance Plains region.

The proposed offset is considered suitable to counterbalance the significant residual impacts to Carnaby's cockatoo foraging habitat and Kwongkan Shrublands TEC, due to the presence of 92.46 hectares of Kwongkan Shrublands, of which 88 hectares is in excellent condition and 4 hectares is considered to be in degraded condition. Kwongkan Shrublands also provides foraging habitat for Carnaby's cockatoo.



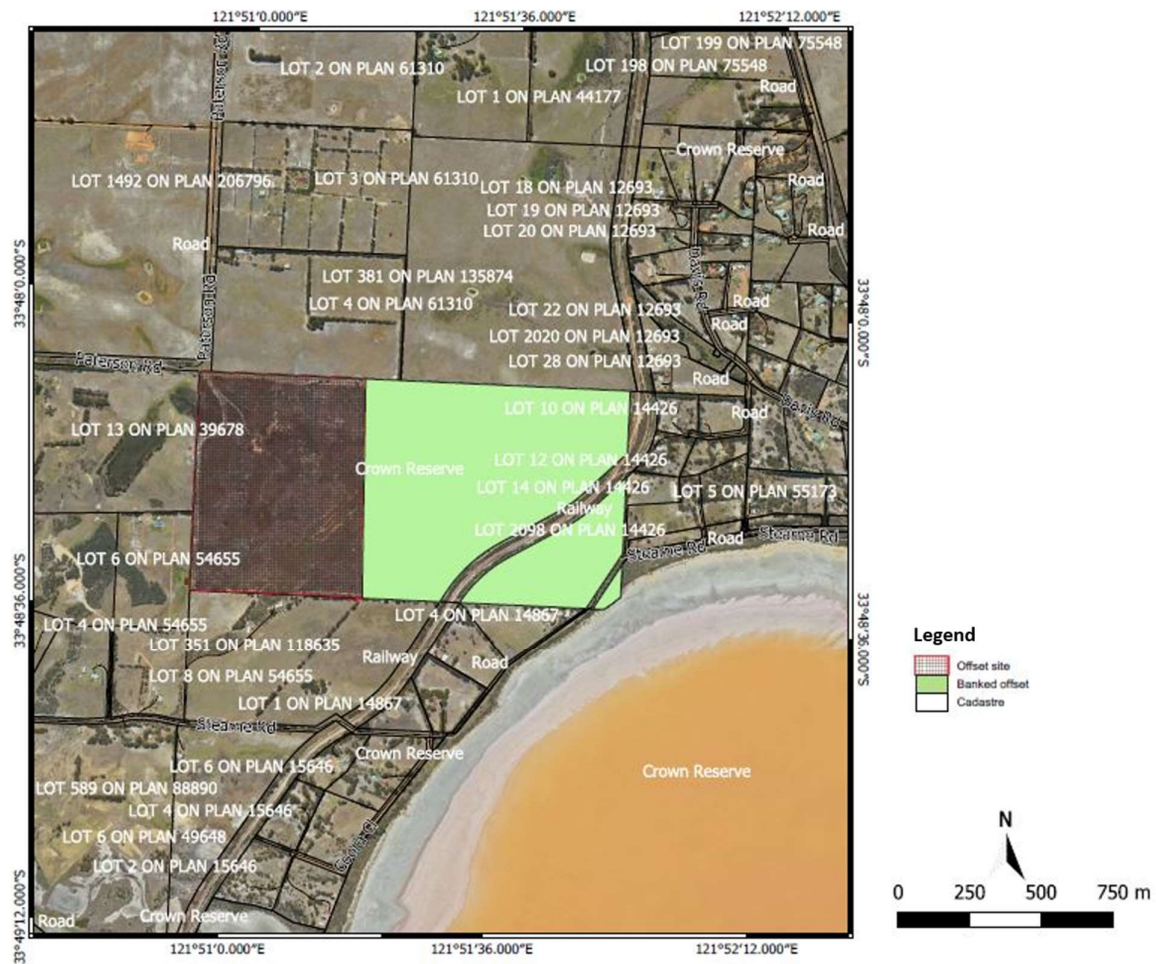


Figure 5: Crown Reserve 4181 approved offset area (44.81 ha) and banked offset (64.91 ha)

## 6. References

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Shire of Esperance (2019b) Application form and supporting documents for the Clearing Permit application CPS 8400/1. (DWER Ref: A1771610).

Shire of Esperance (2019c) Targeted Flora Report CPS 8400/1 Neds Corner Rd Reconstruction from South Coast Hwy to Yerritup Rd (DWER Ref: A1860889).

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## 7. GIS Databases:

- Aboriginal Sites of Significance
- CPS Areas applied to clear
- DBCA Managed Estate
- Directory of Important Wetlands
- Geomorphic Wetlands
- Groundwater salinity
- Hydrography, hierarchy
- Hydrography, linear
- Land Degradation datasets
- SAC Bio Datasets (accessed August 2019)
- Soils, Statewide
- Topographic contours
- TPFL
- WAHerb Data
- WA TEC PEC Boundaries

## 8. Appendix 1: Justification of values used in the EPBC offsets calculator

### Crown Reserve 4181 – offset associated with counterbalancing the significant residual impacts to Carnaby's cockatoo foraging habitat and Kwongkan Shrublands TEC

Calculator Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	1.2% - afforded to Carnaby's cockatoo habitat and Kwongkan Shrublands TEC, both listed as endangered under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	5.56 hectares of Carnaby's Cockatoo foraging habitat and 2.06 hectares of Kwongkan Shrublands within application area. This is based on a flora and vegetation survey undertaken by the applicant.
<i>Quality of impacted area (habitat/community)</i>	The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	The vegetation within the application area ranges from Very Good to Degraded (Keighery 1994) condition, this has been averaged to be in Good condition.
<i>Time over which loss is averted (habitat/community)</i>	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	The proposed offset would change the purpose of the reserve to conservation in perpetuity therefore the maximum 20 years is applied.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	The process for changing the vesting from common reserve to conservation is expected to occur within one year.
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	44.81 hectares of vegetation in Very Good to Excellent condition at Reserve 4181 is required to offset 100% of the significant residual impacts from the proposed clearing of Carnaby's cockatoo foraging habitat and Kwongkan shrublands TEC.
<i>Start quality (habitat/community)</i>	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	The native vegetation within Reserve 4181 is in Very Good to Excellent (Keighery 1994) condition.
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	Same values as Start Quality. It is expected that over the foreseeable future (20 years), the current condition of the site will not deteriorate in the absence of a change in land tenure.
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	Same values as Start Quality. The condition of the vegetation is unlikely to change in the presence of a change in land tenure.
<i>Risk of loss (%) without offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	20% - the proposed offset area is vested as common reserve. Risk of loss higher due to the proximity of the proposed offset area to tourist areas.

<i>Risk of loss (%) with offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	Securing the land parcel within conservation estate should reduce the risk of loss to 10%. The risk of catastrophic events (fire, dieback etc.) remain.
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	There is a high level of confidence that the conservation covenant will mitigate the risk of loss.
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	There is a high level of confidence that the offset site would remain in at its current quality if managed for conservation.
<i>% of impact offset</i>	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	100% - to completely offset significant residual impact.