



# Clearing Assessment Report – CPS 818

*We're working for  
Western Australia.*

Brookton Hwy (H052) seal widening  
SLK 203.27 - 250.91

August 2021

EOS 2342

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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	<b>Environmental Officer</b>	Draft v1	28/ 05/2021
Reviewer:	<b>Senior Environment Officer</b>	Rev 0	30/6/2021
Author:	<b>Senior Environmental Officer</b>	Draft v2	12/07/2021
Author:	<b>Senior Environmental Officer</b>	Rev 1	9/08/2021
Author	<b>Senior Environmental Officer</b>	Rev 2	23/09/2021
Author	<b>Senior Environmental Officer</b>	Rev 2	28/09/2021

## 1 PURPOSE

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

The CAR outlines the key activities associated with the proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the proposal using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

## 2 SCOPE

### 2.1 Proposal Scope

**Proposal Name:** Brookton Highway (H052) Seal Widening 203.27-250.91 SLK

**Proposal Purpose / Components:** This proposal is a component of the larger regional safety improvements project being undertaken across the Wheatbelt and other regions.

Main Roads will be widening Brookton Highway (H052) by undertaking low-cost seal widening on the existing cleared formation. The road will be widened approximately 0.5m either side, to establish a uniform 10 m seal width.

To facilitate the seal widening, six culverts will also be extended by 1.2–2.4 m.

**The proposed clearing undertaking using CPS 818 is :** 2.79 ha

**The proposed temporary clearing undertaking using CPS 818 is:** None.

**Proposal Location:** The Proposal is located on Brookton Highway (H052) between SLK 203.27-250.91 in the Shire of Corrigin and Shire of Kondinin (Figure 1).

The Proposal is bound by the Corrigin and Kondinin town centres and involves a 8 m wide works area from the Brookton Highway road centreline (proposal area) comprising 29.7 ha. The proposal also considers the removal or retention of Suitable DBH Trees that are on the border (within 8 m of the road centreline) of the of the sealing/widening works. Trees proposed to be removed following ground truthing have been included within the proposal area.

The Proposal extent is presented in Figure 1.

The following term has been used in this CAR:

- *Proposal area:* This area represents the area of disturbance for the proposed widening and sealing works, and six locations for culvert extensions. The Proposal area comprises 29.7 ha, and the proposal will require up to 2.79 ha of vegetation clearing to accommodate the proposed works. This also includes the removal of 32 Suitable DBH Trees.

### 2.2 Assessment Report Scope

The assessment area is confined to a local area of a 20 km from Brookton Highway 155–250 SLK. An area bigger than the Proposal extent. The assessment area has informed the desktop assessment provided by ecologia (2021) for the proposal.

Figure



**Figure 1**  
**Brookton Highway (203.27-250.91 SLK) Seal Widening and Culvert Extensions**  
 Proposal Location

**Legend**

- Culvert locations
- Proposal Area

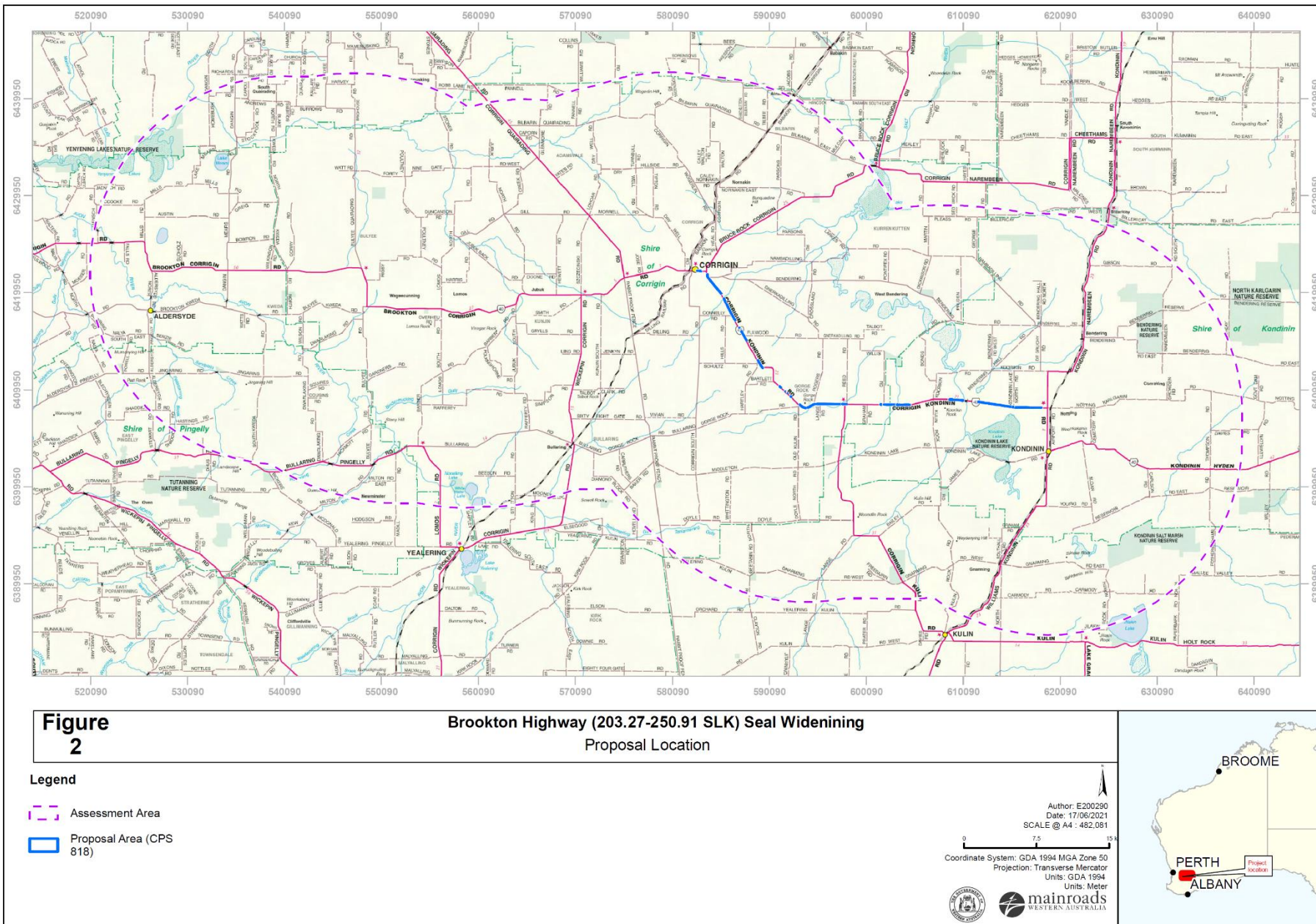
Author: E200290  
 Date: 9/07/2021  
 SCALE @ A4 - 1:65,000

0 2.5 5 km

Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Transverse Mercator  
 Units: GDA 1994  
 Units: Meter



Document Path: E:\wheatbe@STATE\H052 Brookton Highway\140 - 250\G10\H052 Brookton Hwy - SLK 140-250 - Proposal Location V2.mxd



Document Path: E:\Wheatbelt\STATE\H052 Brookton Highway\140 - 250\GIS\H052 Brookton Hwy - SLK 140-250 - Study Area V1.mxd

### **2.3 Alternatives to clearing**

This proposal is a component of the larger regional safety improvements proposals being undertaken across the Wheatbelt and other regions. The works involve sealing within the existing maintenance zone or extending up to 0.5 m outside the maintenance zone where locations do not meet the 10 m by 10 m road formation. There are no alternatives to clearing for the road widening and sealing of the existing road formation.

### **2.4 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts**

The design and management measures implemented to avoid and minimise the clearing impacts by the proposal are provided in Table 1.

**Table 1: Measures undertaken to Avoid, Minimise, Reduce and Manage the Project Clearing Impacts**

Design or Management Measure	Discussion and Justification
<b>Steepen batter slopes</b>	<p>The chosen work method of profiling and exsitu stabilisation of the road shoulders will mean that there will be limited intrusion into the adjacent verge, almost all of the work to form and seal the shoulders being able to be done from the roadway. There are no high fills along this road and so there is no benefit in steepening roadside batter slopes. However where the table drains need to be re-formed, such as at locations where the culverts need to be extended, the cut batter slopes on the back side of the drains can be formed steeper to lessen the clearing required to form the drains.</p>
<b>Installation of safety barriers</b>	<p>For a number of close trees within 8 metres of the road centreline the road formation, seal and traffic lane width does not provide enough shoulder width to accommodate a safety barrier and the required deflection distance, and so these trees will need to be removed both for safety and clearance for construction plant purposes. .</p> <p>For trees located 10 metres or more from the road centreline these will be retained.</p> <p>Determinations were made for trees located between 7 and 8 metres from the road centreline with the following considerations:</p> <ul style="list-style-type: none"> <li>a) To retain with less than desirable clearance to the trafficked way unprotected;</li> <li>b) To retain with an additionally widened shoulder and install guardrail;</li> <li>c) Reduce the targeted total seal width to 8 or 9 metres so as to retain a wider buffer between the edge of the seal and the tree(s).</li> </ul> <p>Factors that will be considered is whether it is an isolated tree or quite a number over a length of road, the latter justifying the cost of the guardrail or the lesser safety benefit of the narrower seal.</p> <p>At the Corrigin townsite entry the seven (9) Suitable DBH Trees will be retained despite being closer than 8 metres from the road centreline because of the lower speed zone in this town entry.</p>
<b>Alignment to one side of existing road</b>	<p>Not applicable as the works are being undertaken on the existing formation and within the maintenance areas, i.e. there's no realignment or adding of additional traffic lanes involved.</p>
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas</b>	<p>Not applicable as the works are being undertaken on the existing formation and within the maintenance areas, i.e. there's no realignment or adding of additional traffic lanes involved.</p>

Design or Management Measure	Discussion and Justification
<b>Installation of kerbing</b>	As the works are for the most part being done on the existing rural open road highway raised formation and within the existing maintenance zone, incorporating kerbing would not provide any material benefit in lessening the construction footprint but would significantly add to the cost of the works.
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	The design is already very simple, with works outside of the existing road formation footprint and maintenance zone kept to a minimum.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	All the works are contained to the existing cleared areas other than the localised clearing needed for the shoulder/formation width and culvert extensions.
<b>Drainage modification</b>	Existing roadside table drains are being retained or reformed slightly further from the road where the shoulders have needed to be locally widened or the culverts extended. Any clearing needed to accommodate this will be minimised via steepened backslopes and not extending culverts further than necessary to achieve a safe offset of the headwalls from the edge of the trafficked way.

## 2.5 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the *Environmental Protection Act 1986* (EP Act) and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

Main Roads has considered matters using the below instruments in accordance with s. 51O of the EP Act.

### **Other Legislation of relevance for assessment of clearing and planning/other matters**

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA)
- *Town Planning and Development Act 1928*

### **Environmental Protection Policies**

- *Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992;*
- *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011*

### **Other Relevant policies and guidance documents:**

- Environmental Offsets Policy (GoWA 2011)
- A guide to the assessment of applications to clear native vegetation (DER 2014)
- Procedure: Native vegetation clearing permits (DWER 2019)
- Environmental Offsets Guidelines (GoWA 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020)
- Approved conservation advice under s. 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice - EPA

## 3 SUMMARY OF SURVEYS

### 3.1 Biological Survey

Main Roads Western Australia (Main Roads) commissioned ecologia Environment (ecologia) in 2020 to undertake a biological survey of the survey area (covering 376.14 ha) on Brookton Highway between 155 and 202.66 and SLK 203.27 and 250.91 to delineate key flora, fauna, soil, groundwater and surface water conservation values and potential sensitivity to impact. The assessment also involved a government database and literature review of environmental values within 20 km of the survey area to inform the field investigation.

The detailed flora and vegetation survey was conducted by three ecologia botanists over 10 days between the 9th – 13th November and 16th – 20th November 2020. The survey was completed in accordance with the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, primarily by sampling vascular plant species within bounded quadrats.

Section 3.1.1 contains the summary of the survey.

Appendix 1 contains the Main Roads reference item numbers for the biological survey report and associated shapefiles for ecologia (2021).

#### 3.1.1 Summary of Biological Survey

The following summary presents findings applicable to the proposal area (203.27–250.91 SLK) and local area (155–202.66 SLK).

##### Flora and Vegetation

A total of 355 vascular plant taxa representing 59 families and 172 genera were recorded within the survey area. No Threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or *Biodiversity Conservation Act 2016* (BC Act).

Eight DBCA listed Priority species were recorded within the survey area: *Acacia sclerophylla* var. *teretiuscula* (P1), *Banksia dallanneyi* subsp. *agricola* (P2), *Banksia rufa* subsp. *obliquiloba* (P3), *Beaufortia burbridgeae* (P3), *Daviesia nudiflora* subsp. *drummondii* (P3), *Daviesia uncinata* (P3), *Eucalyptus erythronema* subsp. *inornata* (P3), and *Calothamnus brevifolius* (P4). Twenty-eight introduced plant species were recorded, two of which (*Asparagus asparagoides* and *Echium plantagineum*) are listed as Declared Pests on the Western Australian Organism List (WAOL), and *A. asparagoides* is further classified as a Weed of National Significance (WONS). Only *Acacia sclerophylla* var. *teretiuscula* (P1), *Banksia dallanneyi* subsp. *agricola* (P2) were identified within the proposal area. No Declared Pests on the on the WAOL or weeds listed as WONS was identified within the proposal area.

Hierarchical agglomerative clustering was conducted using floristic data from 103 quadrats and relevés. Based on this classification, 12 vegetation types were characterised and mapped within the survey area, only eight (including Parkland Cleared and Revegetation) occur within the proposal area. The survey area consists primarily of plains and low hills dominated by *Eucalyptus* mid open woodlands, *Allocasuarina* shrublands and woodlands, mallee woodlands, and *Tecticornia* samphire shrublands on saline flats. Except for vegetation corresponding to the 'Eucalypt Woodlands of the Western Australian Wheatbelt' TEC, none of the vegetation types were assessed as corresponding to any National or State listed TEC or PEC. One vegetation type (Sh02) potentially supports the Threatened species *Grevillea scapigera* west of the Corrigan townsite within the Corrigin Nature Reserve but this species was not recorded within the survey area. This species was previously recorded adjacent to the entrance to the Corrigin Airstrip in 2009/10. The location of these records was searched during the survey, however the species could not be relocated.

The eucalypt woodlands occurring within the survey area are typically dominated by ten eucalypt species that are classified as key indicators of the Eucalypt Woodlands TEC: *Eucalyptus kondininensis* (Kondinin blackbutt), *Eucalyptus longicornis* (red morrel), *Eucalyptus loxophleba* subsp. *loxophleba* (York gum), *Eucalyptus occidentalis* (flat-topped yate), *Eucalyptus salicola* (salt gum), *Eucalyptus salmonophloia* (salmon gum), *Eucalyptus salubris* (gimlet), *Eucalyptus sargentii* subsp. *sargentii* (salt river gum), *Eucalyptus urna* (merrit), *Eucalyptus wandoo* subsp. *wandoo* (wandoo). Fifty-nine eucalypt woodland patches within the survey area were assessed as the Eucalypt Woodlands TEC, with a total extent of 33.8 ha within the survey area (8.99% of the survey area)

### **Fauna and Fauna Habitat**

Six habitat types were identified within the survey area, which are considered generally common in the Wheatbelt and are not restricted to the survey area. In general, habitat types within the survey area were assessed as generally in 'Degraded' to 'Very Good' condition, with grassy weed infestations present along the roadside, impacts from introduced fauna species and clearing identified as the primary factors contributing to lower condition ratings. Large areas of road and verge have been cleared to facilitate previous infrastructure development and have been subsequently rehabilitated.

Low intensity fauna sampling was undertaken, and fauna recorded were generally common and not restricted to either survey area. A total of 38 vertebrate fauna species were recorded, including three reptiles, eight mammals and 27 birds. Seven introduced species were recorded: horses, sheep, European cattle, rabbit, little corella, rock pigeon and the red fox. No Threatened, Specially Protected or Priority fauna species were recorded during the current survey.

Twenty-five significant vertebrate species were identified from the desktop assessment. Of these, the peregrine falcon and western quoll have previously been recorded within the survey area, but not in the proposal area. The red-tailed phascogale, Carnaby's cockatoo and malleefowl were assessed as 'Likely' to occur and the western mouse, western brush wallaby and western rosella were allocated a post-survey likelihood of occurrence rating of 'Possible' within the wider survey area. The approximate extent of potential red-tailed phascogale habitat within the survey area was 65.03 ha (17.29% of total area); however, habitat identified within the survey area was generally low-quality with negligible understorey.

### **Black Cockatoo Assessment**

A total of 2,035 trees that met the minimum DBH criteria for potential black cockatoo suitable DBH and roosting habitat trees were identified within the survey area. No trees with known nesting hollows were recorded. Thirty-three trees with suitable hollows and evidence of chew marks surrounding hollow entrances were recorded and an additional 166 trees of a suitable diameter to contained potentially suitable hollows but had no evidence of usage. Two hundred and fifty-nine trees contained hollows which were not suitable for black cockatoos and a further 1,577 trees possessed no visible hollows.

The survey area contains patches of Open Eucalypt Woodland habitat adjacent to remnant bushland and nature reserves which may be used by black cockatoos for foraging, roosting and breeding. However, no primary or secondary evidence of black cockatoos were recorded during the survey, either within the survey area or in the surrounding area. Given the appropriate timing of the survey and absence of large trees within the survey area containing known breeding hollows, it is unlikely that Carnaby's cockatoos are currently utilising the habitats identified within the survey area.

## 3.2 Detailed Black Cockatoo Assessment

Kirkby (2021) completed a detailed black cockatoo assessment survey between 16<sup>th</sup> and 17<sup>th</sup> of June 2021 for 31 Suitable DBH Trees (containing Category 2 and 3 hollows) identified by ecologia (2021) within 10 m of the Brookton Highway road center line between 203.27–250.91 SLK from Corrigin and Kondinin.

The purpose of the subsequent survey was to conduct a detailed assessment of these trees to assess their potential use for breeding by Carnaby's Cockatoo. The hollows were first inspected by Tony Kirkby from ground level with binoculars and if possible and safe (danger from feral bees and rotten/falling branches) were then inspected with a pole camera. Hollows considered by Kirkby (2021) as unsuitable for breeding (too small, wrong angle etc.) were not inspected with a pole camera. As such, only 30 trees were inspected, which contained a total of 54 hollows.

Locations of the trees assessed are provided in the detailed black cockatoo assessment report outlined in Appendix 2.

### 3.2.1 Summary of black cockatoo survey

Of the 54 hollows inspected across the 30 Suitable DBH Trees, 13 hollows had entrances which appeared to be of a suitable size and shape to be used by Carnaby's Cockatoos when viewed from ground level. The majority (41) of the hollows were considered too small for use. Three of the 41 hollows in trees had Galah's (*Eolophus roseicapilla*) present.

While many of the hollows had a suitable entrance sizes most were located at the ends of small branches which are unable to provide a suitable nest chamber.

Two out of the 30 Suitable DBH Trees assessed by ecologia (2021) were identified by Kirkby (2021) to contain the correct entrance dimensions for a suitable hollow for Carnaby's Cockatoo:

- **Salmon Gum** (-32.456739, 118.018125) contained a recently exposed, and suitably sized hollow following snapped branch. However, no signs of use.
- **Red Morrel** (-32.456947, 118.217839) contained a deep hollow in which the floor space can't be seen, with no signs of use.

Neither of these two trees had evidence of use by black cockatoos. The remaining 29 trees contained hollows not suitable for use, or had suitable entrance dimensions, but lacked the appropriate depth or internal dimensions to be used for breeding.

Carnaby's Cockatoo monitoring further east in the Hyden/Dragon Rocks during the past five breeding seasons have demonstrated no observations of black cockatoos between Brookton and Kondinin. Potentially due to a shortage of foraging habitat (Kirkby 2021).

Any hollows within the proposal area were outlined by Kirkby (2021) to unlikely be used by Carnaby's Cockatoo at the present time.

## 4 VEGETATION DETAILS

### 4.1.1 Proposal Vegetation Description

The proposal is located within the Avon Wheatbelt region and Western Mallee IBRA subregion, which is characterised by a mosaic of cleared agricultural land and patches of remnant native vegetation. In the local context, the proposal area is situated within a road reserve (of various width) surrounded by cleared paddocks and remnant vegetation.

The proposal area comprises the following eight vegetation types:

- *Tecticornia indica*, *T. pergranulata*, *T. undulata* low open samphire shrubland (**Sa01**)
- *Allocasuarina campestris* mid/tall open shrubland; *Banksia pallida*, *Gastrolobium spinosum*, *Austrostipa elegantissima* low open shrubland/grassland (**Sh03**)
- *Acacia acuminata*, *Allocasuarina campestris*, *Eucalyptus loxophleba* low open woodland; *Austrostipa elegantissima*, *Neurachne alopecuroidea*, *Dianella revoluta* low open grassland/forbland (**W01**)
- *Eucalyptus salubris*, ±*E. salmonophloia*, ±*E. longicornis* mid woodland; *Atriplex vesicaria*, *Rhagodia drummondii*, *Lycium australe* low open shrubland/grassland (**W05**)
- *Eucalyptus loxophleba*, *E. salmonophloia*, *E. wandoo*, ±*Acacia acuminata* mid woodland; *Maireana brevifolia*, *Austrostipa elegantissima*, *Rytidosperma acerosum* low open shrubland/grassland (**W07**)
- Parkland Cleared
- Revegetation.

Approximately 88% of the proposal area is already cleared. The condition of the remaining areas of native vegetation range between 'completely degraded' to 'Very Good to Excellent' (ecologia 2021).

Table 2 provides a summary of the vegetation condition within the proposal area:

**Table 2: Vegetation condition of the proposal area**

Condition	Area (ha)	% total proposal area
Very Good to Excellent	0.03	0.10%
Very Good	0.46	1.56%
Good to Very Good	1.05	3.52%
Good	0.48	1.62%
Degraded	1.03	3.46%
Completely Degraded to Degraded	0.01	1.33%
Completely Degraded	0.39	0.03%
Cleared	26.3	88.4%
<b>Total Area (ha)</b>	<b>29.7</b>	

The proposed works predominately (88.4%) occur within the cleared areas of the existing maintenance zone of Brookton Highway. Roadside vegetation within the proposal area has been mapped predominately in 'Good to Very Good', 'Very Good' and 'Degraded' condition. The proposed clearing of 2.79 ha is restricted to vegetation directly adjacent to an existing road and cleared maintenance zone and will be affected by edge effects. Consequently, the proportion of vegetation in Good or better condition is likely to be lower than the vegetation condition mapping indicates.

**Tables 3 and 4** provide details of the Pre-European Vegetation Associations with the proposal area and the remaining extents of these associations.

**Table 3: Summary of Mapped Pre-European Vegetation Associations in proposal area**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
<b>Vegetation Association 8</b> described as medium woodland; salmon gum & gimlet	Clearing of up to 2.79 ha for road widening and reconstruction on GEH.	Very Good to Excellent - Completely Degraded (ecologia 2021)	Vegetation description and condition determined from biological survey (ecologia 2021) in accordance with EPA guidelines.
<b>Vegetation Association 955</b> described as mosaic: shrublands; scrub-heath (South East Avon) / Shrublands; <i>Allocasuarina campestris</i> thicket			
<b>Vegetation Association 959</b> described as succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire			
<b>Vegetation Association 1023</b> described as medium woodland; York gum, wandoo & salmon gum ( <i>Eucalyptus salmonophloia</i> )			

**Table 4: Pre-European Vegetation Representation – Shire of**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 8</b>	<b>Statewide</b>	694,638.14	346,425.77	49.87	6.77
	<b>IBRA Bioregion</b> Avon Wheatbelt	356,571.81	50,340.31	14.12	1.22
	<b>IBRA Bioregion</b> Mallee	56,422.47	19,504.27	34.57	28.34
	<b>IBRA Sub-region</b> Merredin	353,871.79	49,941.57	14.11	1.23
	<b>IBRA Sub-region</b> Katanning	2,700.02	398.74	14.77	-
	<b>IBRA Sub-region</b> Western Mallee	41,336.05	4,417.85	10.69	2.19
	<b>Local Government Authority</b> Shire of Corrigin	4,197.38	529.94	12.63	-
	<b>Local Government Authority</b> Shire of Kondinin	388.41	9.91	2.55	-
<b>Veg Assoc No. 955</b>	<b>Statewide</b>	139,324.02	15,281.57	10.97	1.30
	<b>IBRA Bioregion</b> Avon Wheatbelt	120,564.93	12,900.72	10.70	0.91
	<b>IBRA Bioregion</b> Mallee	18,759.09	2,380.85	12.69	3.79
	<b>IBRA Sub-region</b>	84,863.54	8,076.72	9.52	

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
	Merredin				
	<b>IBRA Sub-region</b> Katanning	35,701.39	4,824.00	13.51	0.96
	<b>IBRA Sub-region</b> Western Mallee	18,759.09	2,380.85	12.69	3.79
	<b>Local Government Authority</b> Shire of Corrigin	27,299.83	2,663.91	9.76	0.39
	<b>Local Government Authority</b> Shire of Kondinin	2,933.02	222.21	7.58	-
<b>Veg Assoc No.</b> 959	<b>Statewide</b>	13,092.41	5,666.37	43.28	14.22
	<b>IBRA Bioregion</b> Avon Wheatbelt	4,863.72	2,573.50	52.91	16.44
	<b>IBRA Bioregion</b> Mallee	8,228.69	3,092.87	37.59	12.91
	<b>IBRA Sub-region</b> Merredin	4,853.32	2,572.51	53.01	16.48
	<b>IBRA Sub-region</b> Katanning	10.41	1.00	9.58	-
	<b>IBRA Sub-region</b> Western Mallee	8,228.69	3,092.87	37.59	12.91
	<b>Local Government Authority</b> Shire of Corrigin	1,975.34	868.75	43.98	7.59
	<b>Local Government Authority</b> Shire of Kondinin	2,384.25	912.54	38.27	-
<b>Veg Assoc No.</b> 1023	<b>Statewide</b>	71,035.87	51,221.57	72.11	29.00
	<b>IBRA Bioregion</b> Avon Wheatbelt	1,522,680.40	165,123.60	10.84	1.13
	<b>IBRA Bioregion</b> Mallee	63,990.29	4,654.38	7.27	0.55
	<b>IBRA Sub-region</b> Merredin	398,944.17	26,714.63	6.70	0.74
	<b>IBRA Sub-region</b> Katanning	1,123,736.23	138,408.96	12.32	1.27
	<b>IBRA Sub-region</b> Western Mallee	63,990.29	4,654.38	7.27	0.55
	<b>Local Government Authority</b> Shire of Corrigin	196,862.70	14,949.44	7.59	0.70
	<b>Local Government Authority</b> Shire of Kondinin	25,884.03	1,846.19	7.13	0.09

Source: Adapted from GoWA (2019) Vegetation Statistics

## 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the proposed clearing of up to 2.79 ha is likely to have a significant impact on the environment, the proposal was assessed against the ten Clearing Principles (Environmental Protection Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER’s ‘A Guide to the Assessment of Applications to Clear Native Vegetation’ and other relevant CPS Decision Reports prepared by DWER.

The assessment has determined that the proposed clearing is ‘not at variance’ with principles (a), (c), (d), (h), (i), (j); is ‘not likely to be at variance’ with principles (b), (e), (g) and is ‘at variance’ with principle (f).

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

<b>Proposed clearing is not at variance to this Principle</b>
<p>The proposal requires the clearing of 2.79 ha of vegetation (of which 2.38 ha is in Degraded or better condition) within a proposal area of 29.7 ha. Approximately 90% of the proposal area is already cleared or highly disturbed and the remaining areas of native vegetation range between ‘Very Good to Excellent’ and ‘Completely Degraded’ condition (ecologia 2021).</p> <p>The proposal area comprises the following seven vegetation types (ecologia 2021):</p> <ul style="list-style-type: none"> <li>• <i>Tecticornia indica</i>, <i>T. pergranulata</i>, <i>T. undulata</i> low open samphire shrubland (<b>Sa01</b>)</li> <li>• <i>Allocasuarina campestris</i> mid/tall open shrubland; <i>Banksia pallida</i>, <i>Gastrolobium spinosum</i>, <i>Austrostipa elegantissima</i> low open shrubland/grassland (<b>Sh03</b>)</li> <li>• <i>Acacia acuminata</i>, <i>Allocasuarina campestris</i>, <i>Eucalyptus loxophleba</i> low open woodland; <i>Austrostipa elegantissima</i>, <i>Neurachne alopecuroidea</i>, <i>Dianella revoluta</i> low open grassland/forbland (<b>W01</b>)</li> <li>• <i>Eucalyptus salubris</i>, ±<i>E. salmonophloia</i>, ±<i>E. longicornis</i> mid woodland; <i>Atriplex vesicaria</i>, <i>Rhagodia drummondii</i>, <i>Lycium australe</i> low open shrubland/grassland (<b>W05</b>)</li> <li>• <i>Eucalyptus loxophleba</i>, <i>E. salmonophloia</i>, <i>E. wandoo</i>, ±<i>Acacia acuminata</i> mid woodland; <i>Maireana brevifolia</i>, <i>Austrostipa elegantissima</i>, <i>Rytidosperma acerosum</i> low open shrubland/grassland (<b>W07</b>)</li> <li>• Parkland Cleared</li> </ul> <p>Two Eucalyptus-dominated woodland vegetation types (W05 and W07) were inferred to align with the EPBC Act-listed Wheatbelt Woodlands TEC and State equivalent (Priority 3) Eucalypt Woodlands PEC (ecologia 2021). A total of 0.98 ha of this ecological community within the proposal area and an additional 33.8 ha outside of the proposal area in the mapped survey area by ecologia (2021).</p> <p>According to Department of the Environment (DotE, 2015), there is an estimated 930,075.8 ha of Eucalypt Woodlands TEC remaining in the Wheatbelt as of 2014. A comparison of DBCA’s TEC spatial database against DAFWA remnant vegetation spatial mapping indicates up to 8716.5 ha of Wheatbelt Woodlands TEC potentially occurs within 10 km of the proposal area. The proposed clearing represents &lt;0.001% of the total remaining extent of Wheatbelt Woodlands TEC in the Wheatbelt, and approximately 0.01% of the extent in the surrounding 10 km.</p> <p>At the local scale, the potential clearing of up to 0.98 ha of Wheatbelt Woodlands TEC represents approximately 0.63% of the extent mapped within the ecologia (2021) survey area. Aerial and ground level imagery indicates approximately 156.17 ha of Eucalypt woodlands occurs beyond the survey area where vegetation is contiguous with mapped Eucalypt Woodlands TEC. The total extent of the TEC adjacent to this section of Brookton Highway, based on ecologia (2021) vegetation mapping and desktop extrapolation, is therefore approximately up to 190 ha (illustrated in Appendix 1). Consequently, the proposed clearing of 0.98 ha is more likely to represent approximately 0.52% of the local extent. Given the clearing will be confined to a narrow, linear strip of vegetation either side of Brookton Highway between 203.27-250.91 SLK, and will not lead to significant community decline or fragmentation, the proposed clearing is not likely to have a significant impact on this community.</p>

No other Threatened or Priority ecological communities have been recorded in the proposal area (ecologia 2021).

A total of 355 vascular plant taxa representing 59 families and 172 genera were recorded within the ecologia (2021) survey area. No Threatened species listed under the EPBC Act or BC Act.

Two DBCA listed Priority species were recorded within the proposal area: *Acacia sclerophylla* var. *teretiuscula* (P1) and *Banksia dallanneyi* subsp. *agricola* (P2). No Declared Pests on the on the WAOL or weeds listed as WONS occurs within the proposal area. The Proposal will remove two (2) individuals of Priority 1 species *Acacia sclerophylla* var. *teretiuscula* and one (1) individual of Priority 2 species *Banksia dallanneyi* subsp. *agricola* which represent a regional loss of less than 1% in the State.

Low intensity fauna sampling was undertaken for the Proposal area and local area, and fauna recorded were generally common and not restricted to the ecologia (2021) survey area. A total of 38 vertebrate fauna species were recorded, including three reptiles, eight mammals and 27 birds. Seven introduced species were recorded: horses, sheep, European cattle, rabbit, little corella, rock pigeon and the red fox. No Threatened, Specially Protected or Priority fauna species were recorded at the time of the ecologia (2021) survey.

Twenty-five significant vertebrate species were identified within 20 km of the Proposal area. Of these, the peregrine falcon and western quoll have previously been recorded within the ecologia (2021) survey area. The red-tailed phascogale, Carnaby's cockatoo and malleefowl were assessed as 'Likely' to occur and the western mouse, western brush wallaby and western rosella were allocated a post-survey likelihood of occurrence rating of 'Possible'. The key area where these species may occur are Corrigin Nature Reserve, 2 km east of the proposal area (only identified as likely and possible within the greater survey area). The approximate extent of potential red-tailed phascogale habitat within the survey area was 65.03 ha (17.29% of total area); however, habitat identified within the survey area was generally low-quality with negligible understorey. There was no evidence of any breeding activity from conservation significant fauna at the time of the fauna survey and were not directly observed during opportunistic searches. Vegetation within the proposal area is potentially suitable for these species, however the likelihood of these species using this vegetation is considered low, as discussed in principle (b)

A total of 85 Suitable DBH Trees identified by ecologia (2021) occur within the proposal area suitable for Carnaby's Cockatoo, none of which contain suitable breeding hollows that have been used by black cockatoos (Kirkby 2021). There has been no evidence of observations or breeding activities by Carnaby's Cockatoo recorded over the past five breeding seasons in the local area (Kirkby 2021).

Based on the above, the proposed clearing is not at variance to this principle.

**Methodology**

- DBCA (2020)
- DotE (2015)
- Ecologia (2021)
- GIS Database:
  - Wheatbelt TEC
  - Remnant Vegetation
  - Threatened and Priority Fauna

**(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 indigenous to Western Australia.**

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

**Comment**

- Five habitat types have been recorded in the proposal area (ecologia 2021):
- Acacia Shrubland

- Allocasuarina Shrubland
- Open Eucalypt Woodland
- Revegetated Road Verge
- Cleared (parkland)

Ecologia (2021) also recorded Cleared (other) and Cleared (road/ verge) as providing very little habitat value to fauna.

Ecologia (2021) identified the following seven conservation significant fauna species known to occur or may occur within 20 km of the proposal area:

- Western rosella (*Platycercus icterotis xanthogenys*) (Priority 4)
- Western mouse (*Pseudomys occidentalis*) (Priority 4)
- Carnaby's Cockatoo (*Calyptorhynchus latirostris* – Endangered)
- Chuditch (*Dasyurus geoffroii* – Vulnerable)
- Malleefowl (*Leipoa ocellata* – Vulnerable)
- Peregrine falcon (*Falco peregrinus* – Other specially protected fauna)
- Red-tailed phascogale (*Phascogale calura* – Species of special conservation interest (conservation dependent fauna).

A level 1 fauna assessment over the proposal area did not record any evidence of these species occurring in the proposal area or surrounding vegetation (ecologia 2021).

Western rosella (*Platycercus icterotis xanthogenys*) was identified by Ecologia (2021) as possibly occurring post survey based on old records within 20km of the proposal area and the presence of some potentially suitable habitat present (Open Eucalypt Woodland) within the proposal area. This species prefers Eucalypt and sheoak forests and woodlands. Preferred nesting sites include hollows in Marri, wandoo, salmon gum, flooded gum and York gum (ecologia 2021). The proposed removal of 0.37 ha of potential habitat (Open Eucalypt Woodland) for the western rosella is not expected to have a significant impact to this species as this habitat type is locally and regionally common.

Western mouse (*Pseudomys occidentalis*) (Priority 4) was identified by old records of species within 20 km of the proposal area, with some suitable habitat present within proposal area. This species shows a preference for long unburnt habitat. Vegetation may be variable and includes dense and sparse shrubland, mallee and woodlands. Quondong and sedges are thought to be important habitat requirements of this species. This species was identified by ecologia (2021) as a 'Possible' to occur within the mapped survey area. However, all habitat types within the proposal area, represent potential habitat for this species. As these habitat types not restricted to the proposal area and are considered by ecologia (2021) as generally common at a local level, impacts from clearing associated with the Proposal are expected to be low for this species.

The Open Eucalypt Woodland habitat type adjacent to remnant bushland and nature reserves may be used by black cockatoos for foraging, roosting and breeding and is considered by ecologia (2021) as potential suitable foraging habitat for Carnaby's Cockatoo. No *Banksia*, *Dryandra*, *Hakea* or *Grevillea* species (known foraging and common food items for black cockatoos) were recorded as dominant within the proposal area during the vegetation survey. Up to 1.53 ha of potential foraging habitat for Carnaby's Cockatoo is within the proposal area. The proposal area will also remove up to 32 Suitable DBH trees, none of which were identified to contain any breeding values to Carnaby Cockatoo.

The proposal area is located within the modelled breeding range of Carnaby's Cockatoo (DSEWPaC, 2012). A known Carnaby's cockatoo breeding area occurs approximately 16 km south of the proposal area. No confirmed roosts or breeding areas have been recorded within the proposal area (ecologia 2021). The approximate extent of potential Carnaby's cockatoo breeding, roosting and foraging habitat within the proposal area is 1.53 ha (2.71% of total mapped area by ecologia [2021]). No primary or secondary evidence of black cockatoos were recorded during the ecologia (2021), either within the survey area or in the surrounding area. Given the appropriate timing of the survey and absence of large trees within the survey area containing known breeding hollows, it is not expected that Carnaby's cockatoos are currently utilising breeding and roosting habitat identified within the proposal area. A subsequent detailed black cockatoo assessment confirmed that black cockatoos have not been using the proposal area or local area for breeding over the past breeding seasons (Kirkby 2021).

There are also a number of reserves adjacent to the proposal area e.g. George Rock Nature Reserve, Paperbark Nature Reserve and Kondinin Lake Nature Reserve which may contain suitable Open Eucalyptus Woodland habitat in better condition. Noting the lack of Carnaby's Cockatoo activity in the local area, the vegetation proposed to be cleared is not considered to form significant habitat for Carnaby's Cockatoo and removal of Suitable DBH Trees that do not contain use of breeding by Carnaby Cockatoos, no significant impacts are expected for the species.

The database search identified several historical observations of Malleefowl within 20 km of the proposal area, with no recent records (most dating back to 1990). The majority of nearby records (within 5 km) are those within or near nature reserves such as Unnamed Reserve (R 16196) and Morton Nature Reserve (R31360).

*Allocasuarina* Shrubland, *Acacia* Shrubland and Open Eucalypt Woodland within the proposal area encompass sandy substrates and leaf litter which provide suitable habitat for this species; however, these habitat types are not restricted to the proposal area. There was no evidence of breeding recorded at the time of the fauna survey within the proposal area or adjacent in vegetation. The proposed removal of 0.40 ha of potential Malleefowl habitat is not expected to have any impacts on the species as:

- no evidence of breeding activity (i.e. mounds) was recorded during the ecologia (2021) biological survey;
- clearing comprises a relatively thin strip of vegetation along either side of the Brookton Highway where noise and vibration effects would deter breeding activity;
- feral predators such as the red fox occur in the local area
- vegetation with similar habitat value occurs in the local area.

Chuditch can occur in the Goldfields and Wheatbelt, albeit in lower densities (DEC 2012). There was no evidence of this species within the proposal area at the time of the survey (ecologia 2021) and the species has been historically recorded in 1979 approximately 8.8 km west of the proposal area. Chuditch may utilise the Open Eucalypt Woodland present within the proposal area, however given prospective habitat was generally restricted to small patches of low-quality habitat, feral predator control within the proposal area was absent, the linear nature of the proposed clearing adjacent to the road, and the habitat present likely forms a small part of any individual's home range, it is not expected that habitat identified within the proposal area is capable of supporting a population of western quolls. There are large areas of remnant vegetation in the local area that will provide higher quality habitat, which directly adjoins the proposal area, and various patches of native vegetation in proximity to Brookton Highway. It is noted from the biological survey that there is approximately 45 ha of similar Open Eucalypt Woodlands habitat within the mapped extent of the local area. Therefore, significant impacts to this species or habitats are not expected.

No sightings or secondary evidence were recorded for Red-tailed phascogales during the biological survey by ecologia (2021), however one previous record was identified within 20 km of the proposal area (recorded dated in 1963). Up to 1.53 ha of low quality potential habitat for this species exists within the Proposal Area. The Proposal aims to widen the existing formation and will disturb vegetation immediately adjacent to Brookton Highway. The vegetation proposed to be removed/ disturbed is not expected to support a permanent population due to the lack of recent records and scarcity of quality habitat. This species is also unlikely to use the proposal area as a corridor to move through the landscape because the vegetation lacks a vegetated understorey within 7 m of the road centerline.

Peregrine Falcon is a highly mobile species with wide distributions and would not be reliant on vegetation in the proposal area for habitat.

While the proposal area may provide some habitat value for fauna, including for conservation significant species, given the linear nature of the clearing and extent of native vegetation adjacent to the proposal area, the proposed clearing is not likely to form significant habitat for fauna.

Based on the above, the proposed clearing is not likely to be at variance to this principle.

**Methodology**

EPA (2016, 2020)

DBCA (2020)

<p>Ecologia (2021)                  GIS Database:</p> <ul style="list-style-type: none"> <li>- Wheatbelt TEC</li> <li>- Remnant Vegetation</li> <li>- Threatened and Priority Fauna</li> </ul>
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**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

<p><b>Proposal is not at variance to this Principle</b></p>
<p><b>Comment</b></p> <p>A desktop search identified 15 Threatened flora species that are known to occur within 20 km of the proposal area (DAWE, 2020; GIS Database). No historical records of Threatened flora have been previously recorded in the proposal area.</p> <p>The proposal area was traversed on foot along transects to record the distribution and abundance of any of the significant plant species. No EPBC Act or BC Act listed Threatened species were recorded within the proposal area.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this principle.</p>
<p><b>Methodology</b></p> <p>DAWE (2020)                  Ecologia (2021)                  GIS Database:</p> <ul style="list-style-type: none"> <li>- Threatened and Priority (DBCA)</li> <li>- Threatened and Priority (WA Herbarium)</li> </ul>

**(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.**

<p><b>Proposed clearing is not at variance to this Principle</b></p>
<p><b>Comment</b></p> <p>According to available databases, no TECs listed under the BC Act are known to occur within the proposal area (GIS Database). None of the vegetation types recorded in the proposal area represent a state listed TEC (ecologia 2021).</p> <p>Based on the above, the proposed clearing is not at variance to this Principle.</p>
<p><b>Methodology</b></p> <p>Ecologia (2021)                  GIS Database:</p> <ul style="list-style-type: none"> <li>- Threatened and Priority Ecological Communities (Buffered)</li> </ul>

**(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 to this Principle**

**Comment**

The proposal is located in the Avon Wheatbelt IBRA region, of which approximately 19% of pre-European vegetation extent remains (Government of Western Australia 2019). At a local scale, approximately 18% of remnant vegetation remains in the study area (20 km) (GIS Database).

The vegetation of the proposal area has been broadly mapped as the following pre-European vegetation associations (as outlined in Table 3):

- 8: Medium woodland; salmon gum and gimlet.
- 955 Mosaic: shrublands; scrub-heath (South East Avon) / Shrublands; *Allocasuarina campestris* thicket
- 959 Succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire
- 1023: Medium open woodland; Eucalypts over teatree.

The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30 per cent or more of the pre-clearing extent of each ecological community is necessary if Australia’s biological diversity is to be protected (Commonwealth of Australia 2001). With regard to the four broad vegetation associations mapped within the proposal area, vegetation associations 8, 959, 1023 retain 30% at the state level. Vegetation associations 8, 955 and 1023 have less than 30% in the Avon Wheatbelt IBRA region and Merredin subregion and all vegetation associations have less than 30% at a local government scale (except for vegetation association 959 (Table 4).

With regard to vegetation association 8, there is approximately 1,324 ha of this vegetation association remaining in the surrounding 20 km according to remnant vegetation mapping (GIS Database). Eucalypt woodland vegetation types (W05, W07) within the mapped extent of vegetation association 8 accounts for 0.37 ha of vegetation in the proposal area. This represents:

- approximately 0.03% vegetation 8 present in the study area
- <0.001% present in the statewide, Avon Wheatbelt and Mallee bioregion scale
- <0.1% present at the subregion level (Mallee, Merredin, Katanning and Western Mallee)
- <0.1% at the Shire of Corrigin, and 3.73% at the Shire of Kondinin scales.

In regards to vegetation association 955, there is approximately 3,259 ha of this vegetation association remaining in the surrounding 20 km. Shrubland vegetation types comprising the characteristic species of *Acacia* and *Allocasuarina* (W01, Sh03) within the mapped extent of vegetation association 955 accounts for 0.079 ha of vegetation in the proposal area. This represents approximately <0.002% vegetation 955 present in the study area and <0.2% of the vegetation 955 remaining extents across all statewide, bioregion, subregion and local scales.

In regards to vegetation association 959, there is approximately 3,304 ha of this vegetation association remaining in the surrounding 20 km. There are no vegetation types comprising the characteristic species of succulent steppe with sparse woodland & thicket within the proposal area, or within the mapped extent in the local area. Closely aligned vegetation type would be Sa01 characterised by *Tecticornia indica*, *Tecticornia pergranulata*, *Tecticornia undulata* low open samphire shrubland, however, this vegetation type lacks the overstorey species present in vegetation association 959. This vegetation association has 1.0 ha remaining in its current extent, is highly restricted (as there is only 10 ha of its pre-European extent present in the Katanning subregion) and is not present in the proposal area based on detailed vegetation mapping (1:6000 scale) than the broad 1:250K pre-European vegetation association mapping scale presented in the biological survey report. There are no impacts to this vegetation association from this proposal.

In regards to vegetation association 1023, there is approximately 12,284 ha of this vegetation association remaining in the surrounding 20 km. Vegetation types comprising the characteristic species of medium open woodland; Eucalypts over teatree aligns with all vegetation types within the mapped extent of vegetation association 1023. This accounts for 1.53 ha of vegetation in the proposal area. This represents 0.01% vegetation 1023 present in the study area and <0.01% of the vegetation 1023 remaining extents across all scales.

The proposed works are located within the existing maintenance zone, and clearing will occur in areas 0.5 m from the existing maintenance zone where the 10m x 10m wide formation is required. The proposed clearing is linear in nature and will result in the removal of thin strips of vegetation either side of Brookton Highway. Large areas of remnant vegetation that better represents the vegetation associations is located outside of the proposal area (based on aerial imagery). As such, the proposed clearing will not significantly diminish any vegetation corridors or linkages between larger patches of native vegetation across the landscape. The proposed clearing of 2.79 ha is restricted to vegetation directly adjacent to an existing road and cleared maintenance zone and will be affected by edge effects. Consequently, the proportion of vegetation in Good or better condition is likely to be lower than the vegetation condition mapping indicates.

The proposal area is not considered to support significant remnant vegetation within an extensively cleared landscape. Previous granted clearing permits where the application area supported vegetation that retained less than 30% of its extents but was not considered to be significant remnant by DWER are as follows:

- CPS 7978 – Approximately 10 ha of vegetation in Good to Degraded condition was not considered to be a significant remnant as the majority of the application area was in a Degraded condition.
- CPS 8385 – Approximately 1 ha of vegetation assessed as being in a Very Good to Excellent condition was not considered to be a significant remnant as the application area was less than 0.01% of the vegetation association within the IBRA region T

Therefore the proposed clearing is considered not likely to be at variance to this principle as the proposed clearing is associated adjacent to an existing road across a 40 km stretch and cleared maintenance zone affected by edge effects; as such vegetation is unlikely to represent the mapped condition in areas of good or better condition.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology**

Aerial photography

Ecologia (2021)

EPA (2016)

Government of Western Australia (2019)

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

<b>Proposed clearing is at variance to this Principle</b>
<p><b>Comment</b></p> <p>Several minor non-perennial watercourses intersect the proposal area (GIS Database). These watercourses are only expected to flow following significant rainfall events. Although no vegetation within the proposal area has been formally mapped as riparian vegetation (ecologia 2021), it is considered the proposal area under CPS 818 contains a small area (~0.02 ha) of vegetation growing in association with a watercourse based on the drainage line, saline fat and salt lake landforms. The area proposed to be cleared is minor in scale and nature, with the clearing proposed not expected to impact the values of these watercourses.</p> <p>There are no wetlands in the vicinity of the proposal area.</p> <p>Based on the above, the proposed clearing is at variance to this principle.</p>
<p><b>Methodology</b></p> <p>Ecologia (2021) DWER and DBCA shapefiles</p>

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

<b>Proposed clearing is not likely to be at variance to this Principle</b>
<p><b>Comment</b></p> <p>Topography ranges from 260–340 m ADH, across an approximately 40 km proposal area. Travelling east, the proposal area gently slopes down into the depressions, then increases in elevation towards the eastern extent of the proposal area (GIS Database). The proposal area is characterised by a gently undulating landscape with low relief to low hills and active drainage connected to remnant salt lake chains that only function in the very wet years (ecologia 2021).</p> <p>A variety of soils have been recorded in the proposal area, including sand soils, saline wet soils, shallow gravel and loamy gravel, deep sands, granite outcrop and granitic soils (ecologia 2021).</p> <p>Natural Resource Management Soil Systems and CSIRO Acid Sulphate Soils risk mapping indicates the soils of the proposal area have generally low risk of land degradation. High Probability of ASS occurrence are located at <u>three locations</u> between SLKs 237.93 to 239.7; 240.15 to 240.367; 242.095 to 243.317)</p> <p>Moderate risk of wind erosion with less than 50% of the map unit having 30-50% high to extreme wind erosion risk (GIS Database).</p> <p>Given the linear nature of the clearing and sealing of areas for road construction, the proposed clearing is not likely to lead to an appreciable increase in land degradation. Standard erosion and dust management control measures will be implemented during construction to reduce the incidence of wind erosion.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this principle.</p>
<p><b>Methodology</b></p> <p>GIS Database:</p> <ul style="list-style-type: none"> <li>- Ecologia (2021)</li> <li>- Contours – WB North 25k-100k</li> <li>- CSIRO Acid Sulphate Soils risk mapping</li> <li>- Nature Resource Management SLIP soil systems</li> </ul>

**(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.**

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b></p> <p>The proposed widening works occur within DBCA reserve George Rock Nature Reserve between SLK 222.8–223.6 due to historic errors in the cadastre.</p> <p>DBCA has confirmed that a DAS application is not necessary in this case as there is no nature reserve within the road reserve and there will be no impacts to the reserve based on the scope of works in this location.</p> <p>There are no Environmentally Sensitive Areas within the proposal area.</p> <p>The implementation of a Construction Environmental Management Plan (CEMP) will manage indirect impacts to the George Nature Rock Reserve. The CEMP will include management controls to prevent the introduction and spread of weeds, manage of hydrocarbons, prevent soil erosion and ensure clearing is contained in the approved area.</p> <p>The proposed clearing is linear in nature and will only affect a thin strip of vegetation along the edge of the nature reserve. As such, the proposed clearing will not impact on any linkages between George Rock Nature Reserve and other reserves or patches of remnant vegetation in the local area.</p> <p>Based on the above, the proposed clearing is not at variance to this principle.</p>
<p><b>Methodology</b></p> <p>Ecologia (2021)</p> <p>GIS Database:</p> <ul style="list-style-type: none"> <li>- DBCA Managed Lands</li> </ul>

**(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.**

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b></p> <p>Numerous minor non-perennial watercourses are located in the proposal area. The proposed clearing will only impact a very small area at each watercourse as part of works to upgrade the existing culverts. These activities are not expected to impact on surface water flows or quality.</p> <p>The proposal area does not occur within a Public Drinking Water Source Area (GIS Database). The proposed linear clearing of 2.79 ha of native vegetation along an existing major road is not likely to alter groundwater quality in the area.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this principle.</p>
<p><b>Methodology</b></p> <p>GIS Database:</p> <ul style="list-style-type: none"> <li>- Hydrology South</li> <li>- PDWSAs</li> </ul>

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

<b>Proposed clearing is not at variance to this Principle</b>
<b>Comment</b>

The proposal area is situated in the Swan Avon – Lockhart Catchment which drains into an area of approximately 32, 400 km<sup>2</sup>.

The proposal area averages between 371.5 mm and 332.1 mm annual rainfall respectively based on two nearby weather stations Corrigin (station 10536) and Narembeen (Station 10612).

The topography across the proposal area is gently undulating and soils of the proposal area (adjacent to the existing road infrastructure) have a low risk of waterlogging and flooding (GIS Database), except where the proposal area intersects the location of salt lakes between 328.45 and 238.8 SLK (where >70% of the map unit has a moderate to very high risk of water logging). Works in this area involve widening and sealing of the existing maintenance zone of Brookton Highway, and no culvert extensions.

Minor non-perennial watercourses intersect the proposal area and clearing within these areas (where culverts are located) be for the upgrade of existing culverts, thereby maintaining the existing flow of the watercourse.

The minor and linear nature of the clearing is not expected to result in excessive levels of surface runoff that would increase the intensity or incidence of flooding.

Based on the above, the proposed clearing is not likely to be at variance to this principle.

**Methodology**

BOM (2021)

GIS Database:

- DoW Catchment
- Hydrology South
- Natural Resource Management SLIP soil systems

## 6 ADDITIONAL ACTIONS REQUIRED

Table 5 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

**Table 5. Summary of Additional Management Actions Required by CPS 818**

Impact of Clearing	Yes/No or NA	Further Action Required
<p><b>1.</b> The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.</p>	<p><b>No</b></p>	<p>No further action required.</p> <p>Clearing is at variance to Clearing Principle (f) and no other Clearing Principle, however, the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to:</p> <ul style="list-style-type: none"> <li>(i) a minor non-perennial watercourse(s);</li> <li>(ii) a wetland(s) classed as a multiple use management category wetland(s); and/or</li> <li>(iii) a wetland that is not a defined wetland;</li> </ul> <p>As such, the preparation of an CAR (under condition 6[e]), and associated submissions (under condition 8c of CPS 818/15) is not required.</p>
<p><b>2.</b> Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.</p>	<p><b>No</b></p>	<p>No further action required.</p>
<p><b>3.</b> The project involves clearing for temporary works (as defined by CPS 818).</p>	<p><b>No</b></p>	<p>No further action required.</p>
<p><b>4 a.</b> Project is within Region that:</p> <ul style="list-style-type: none"> <li>- Has rainfall greater than 400mm and</li> <li>- Is South of the 26<sup>th</sup> parallel and</li> <li>- Works are in 'Other than dry conditions' and</li> <li>- Works have potential for <b>uninfested</b> areas to be impacted</li> </ul>	<p><b>No</b></p>	<p>Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists</p>
<p><b>4b.</b> Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?</p>	<p><b>No</b></p>	<p>No further action required.</p>
<p><b>5.</b> Main Roads has been notified by DWER or an environmental specialist that the area to be cleared</p>	<p><b>No</b></p>	<p>No further action required.</p>

Impact of Clearing	Yes/No or NA	<i>Further Action Required</i>
is susceptible to a pathogen other than dieback		
<p><b>6.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition</p>	<p><b>Yes</b></p>	<p>The proposal includes implementation of a CEMP, which will prevent the spread of weeds to adjacent areas of native vegetation.</p> <p>As the surrounding vegetation has been mapped in some areas in Good or better condition, herbicide treatment will occur once every year for five years after clearing activities for the proposal have finished.</p> <p>Records of annual weed control must be recorded in EOS Compliance Tab</p>

## 7 STAKEHOLDER CONSULTATION

Stakeholder consultation is not required as the proposed clearing of 2.79 ha is not likely to be 'at variance' or 'maybe at variance' with the Clearing Principles. Submissions are not required to be sought if the clearing is at variance or may be at variance to only Clearing Principle (f) and no other Clearing Principles, and the area of the proposed clearing at variance is less than 0.5 hectares and the Clearing Principle (f) impacts only relate to:

- (iv) a minor non-perennial watercourse(s);
- (v) a wetland(s) classed as a multiple use management category wetland(s); and/or
- (vi) a wetland that is not a defined wetland.

## 8 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum.

## 9 REFERENCES

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