Clearing Assessment Report – CPS 818

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M002 Bindoon Moora Road

26.4-30.6 SLK Tranche 4

July 2022

1862

D22#738170

Contents

Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Senior Environment Officer	Rev A	12-Jul-2022
Reviewer:	Senior Environment Officer	Rev A	21/07/2022

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 project, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

2 SCOPE

2.1 Project Scope

Project Name: M002 Bindoon Moora Road 26.4-30.6 SLK Tranche 4

Project Purpose / Components: In 2018, MRWA Wheatbelt region proposed to widen Bindoon-Moora Road (SLK 26.4 to 30.6) as part of the Blackspot program in response to a number of fatalities and serious crashes within recent years. The proposal also included an upgrade to the Mogumber-Yarawindah Road/Mogumber West Road intersection (SLK 40.3) to improve user efficiency and safety.

The scope of the original Proposal was to widen the seal to 10m, and clear up to 2.9 ha of vegetation, with an estimated 21.5-23.5m wide Proposal area. 35 DBH trees were mapped within the Proposal area. This Proposal was assessed by DWER and offset requirements specified.

The Region now proposes to descope this Proposal and widen the seal to 9m (nominally 1m sealed shoulder) and remain within the existing formation. Only five trees are proposed to be cleared to allow for delivery of this descoped Proposal.

The aim of the Proposal is to improve road user safety by attempting to reduce the frequency and severity of crashes.

The proposed clearing undertaking using CPS 818 is: 0.015 ha

The proposed temporary clearing undertaking using CPS 818 is: Nil

Proposal Location(s): The Proposal area is located on Bindoon Moora Road between 28.2 and 30.0 SLK, approximately 28 km north of the townsite of Bindoon, within the Shire of Chittering (as shown in Figure 1).

- GDA: 50J 409682 6556403
- Latitude: -31.19014
- Longitude: 116.052676

The proposed clearing footprint of five trees is described below:

Tree No.	SLK	Proposed works
1	28.18 LHS	Remove tree – Marri (*C. calophylla*). Site inspection noted 12m high, no observable hollows. Degraded.
2	29.72 RHS	Removal of one trunk of two trunked tree – York Gum *(E. loxophleba)* Site inspection noted 6m high, no observable hollows. Completely degraded.
3	29.88 RHS	Removal of one live trunk and two dead trunks of multi trunk tree – York Gum. Site inspection noted 10m high and no observable hollows. Completely degraded.
4	29.95 LHS	Remove tree – York Gum. Site inspection noted 8-10m high, no observable hollows, three trunk tree severely affected by white ants. Completely degraded.
5	29.96 RHS	Remove tree – Wandoo (*E .wandoo)*. Site inspection noted 8-10m high, no observable hollows, four trunk tree. Degraded.

2.2 Assessment Report Scope

The desktop Study assessment area, see Figure 2, is confined to a local area of a 10 km radius.

Figure 1: Proposal Area

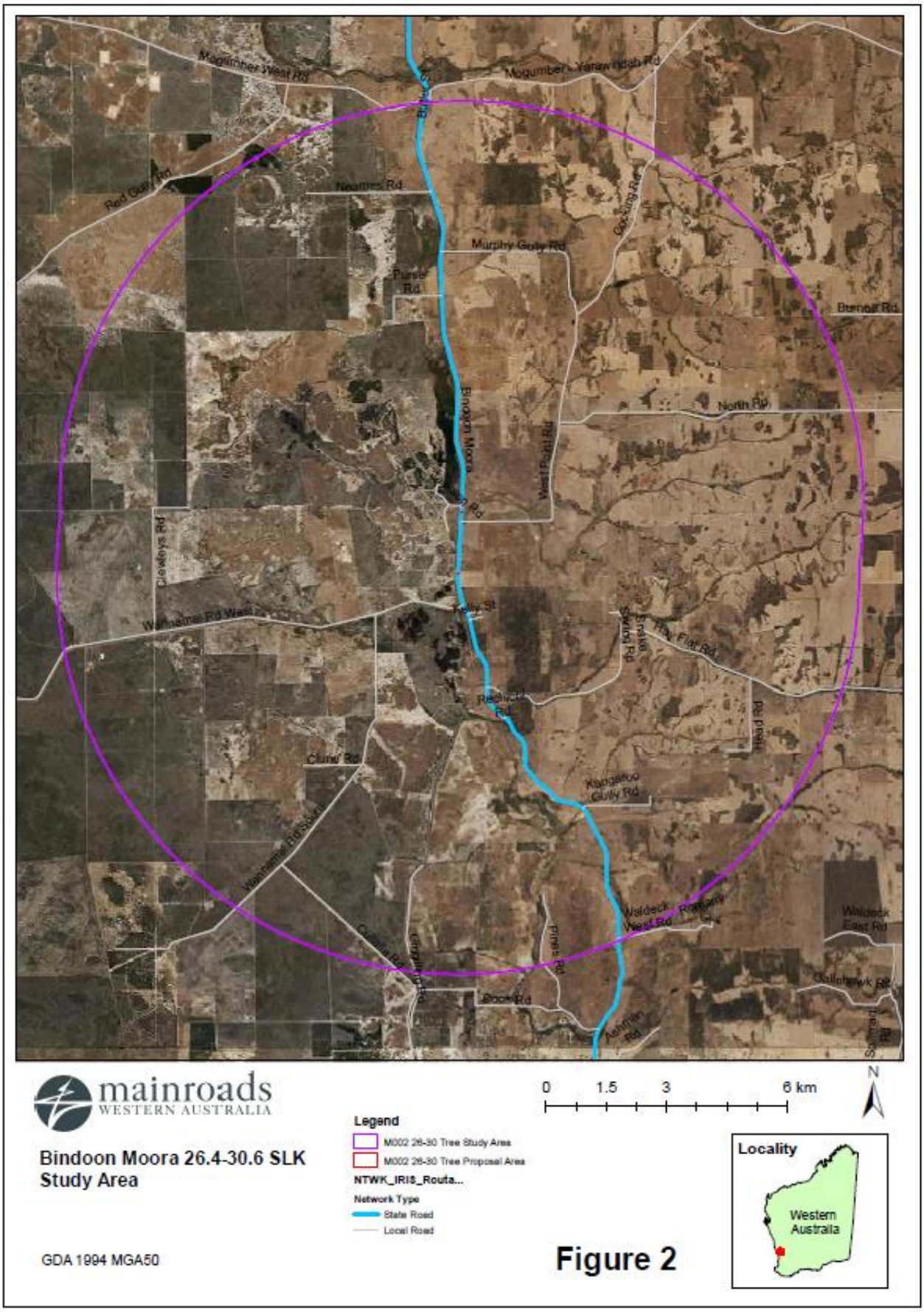

Figure 2: Study Area

2.3 Alternatives to clearing

As the Proposal is to widen the seal to 9m (nominally 1m sealed shoulder) and remain within the existing formation which will require the removal of five trees due to their closeness to the road, no alternatives to clearing exist.

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
Steepen batter slopes	The widened seal is proposed to stay within the existing road formation. Batters will be steepened as required to achieve the target seal width.
Installation of safety barriers	The five trees are too close to the road to allow for the safe and effective use of safety barriers.
Alignment to one side of existing road	The widened seal is proposed to stay within the existing road formation which occurs on either side of the seal.

2.5 Approved Policies and Planning Instruments

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.3), Main Roads has also had regard to the below instruments.

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 (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, August 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 section 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 Flora and Vegetation Survey

The Bindoon Moora Road Widening North of Wannamal Biological Survey was conducted between 9 - 25 November 2018 by CoTerra. The survey area included the Bindoon Moora Road between SLK 26.2 and SLK 30.8 and the Bindoon Moora Road and Mogumber Yarawindah Road intersection between SLK 40.1 and SLK 40.6.

Section 3.1.1 contains the summary of the survey.

3.1.1 Summary of Biological Survey

- Two hundred and fourteen native flowering plant taxa and one native fern taxon were recorded in the survey area. Fifty-two weed species were also recorded in the survey area. Two were Declared Pest species listed under the *Biosecurity and Agriculture Management Regulations 2013* (DPIRD, 2019), **Asparagus asparagoides* and **Moraea flaccida*;
- No Threatened Flora were recorded;
- One Priority taxa was recorded in the Bindoon Moora Road SLK 26.2 and SLK 30.8 survey area - *Synaphea rangiferops* (Priority 2);
- Vegetation condition ranged between 'Completely degraded' to 'Very good', with the majority (approximately 76%) in a 'Completely degraded' to 'Degraded condition'; and
- No TECs or PECs occur within the survey area.

3.2 Fauna Survey

The Bindoon Moora Road Widening North of Wannamal Fauna Survey was conducted on 5 December 2018 by Greg Harewood on behalf of CoTerra.

Section 3.2.1 contains the summary of the survey.

3.2.1 Summary of Fauna Survey

- Survey area consists of a mosaic of cleared or partly cleared areas and areas of remnant native vegetation. The native remnants are generally dominated by wandoo (Eucalyptus wandoo). Other sections contain marri (*Corymbia calophylla*) woodland, York gum (*Eucalyptus loxophleba*) and sheoak (*Allocasuarina spp.*) woodland, sheoak (*Allocasuarina spp.*) and jam (Acacia acuminata) woodland, sheoak (*Allocasuarina spp.*) low open forest and some wetland areas with paperbark (Melaleuca spp.) low open woodland/scrub;
- The black cockatoo habitat assessment identified a total of 78 trees with a diameter at breast height (DBH) of >50 cm (>30 cm for wandoo) within the 9.4 ha survey area. The majority of these trees were not observed to contain hollows of any size;
- Hollows were present in 28 trees, but most of these hollows were assessed as being unsuitable for black cockatoos to use for nesting (e.g. entrance too small, hollow too small or an

unfavourable orientation). However, four (4) were determined at the time to be possibly suitable based on the presence of a hollow or possible hollow of a suitable size and orientation;

- One of these suitable hollows was confirmed as being in use by Carnaby's Black Cockatoos for breeding with a female perching near the hollow's edge at the time of the survey. This hollow is located in a wandoo on the western side (LHS) of the road at SLK 28.92;
- Marri woodland is more common along some sections of the Bindoon-Moora Road survey area and this represents the best quality foraging habitat present but again the extent of this vegetation unit is limited and would also amount to less than 1 ha in total. It is to a certain extent supplemented by areas of sheoak, but overall, this species also is limited in extent and appeares to be of poor quality (small stunted specimens with little fruit);
- The only evidence of black cockatoo foraging within the Bindoon-Moora Road widening survey area was a small amount of chewed marri fruit attributed to foraging by the Forest Red-tailed Black Cockatoos;
- No existing roosting trees (trees used at night by black cockatoos to rest) were identified during the survey period;
- No evidence of any other fauna species of conservation significance utilising the survey area was found during the site reconnaissance survey;
- Overall fauna habitat values at the survey area have been severely compromised by the removal of a significant proportion of the original native vegetation and the degradation of remnant patches. Natural attributes have been diminished and much of the survey area would now only be utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats; and
- Despite the lack of biodiversity, the area still retains some value for fauna species, and provides habitat for some species of conservation significance (e.g. black cockatoos) though the extent of habitat suitable for these species is relatively limited in extent and fragmented which limits its overall value.

3.3 Targeted Black Cockatoo Habitat Assessment

Western Ecological were commissioned to undertake a targeted Black Cockatoo habitat assessment of Bindoon-Moora Road between SLK 26.4 and 30.6 on the 10th of August 2021.

Section 3.3.1 contains the summary of this assessment.

Strategen JBS&G were also commissioned to undertake a Black Cockatoo habitat assessment of Bindoon-Moora Road between SLK 26.4 and 30.6 in November 2021.

Section 3.3.2 contains the summary of this assessment.

3.3.1 Summary of habitat assessment

There was relatively little vegetation within the survey area and even less of that vegetation was considered potential foraging habitat. The most extensive foraging habitat in the survey area are Marri trees which are considered high quality foraging habitat as the nuts are the preferred food of the FRTBC. Marri and its nuts are also considered high quality foraging habitat for Carnaby's Cockatoo as they are known to forage on what is considered a relatively high energy source of food (Cooper et al. 2002). The remaining potential foraging habitats in the survey area are considered low quality and in addition are represented by very small areas.

3.3.2 Summary of habitat assessment

There was approximately 0.73 ha of habitat recorded within the Survey area. Foraging species dominant within the Survey area are Marri (*Corymbia calophylla),* Wandoo *(Eucalyptus wandoo),* York gum *(Eucalyptus loxophleba),* Rock Sheok *(Allocasuarina huegeliana)* and Grass Tree/Balga (*Xanthorrhoea preissii)*.

Based on the composition, structure and condition of the vegetation assessed, the foraging habitat for Carnaby's Cockatoo identified within the Survey area was classified as moderate foraging value for Marri habitat and low to moderate foraging value for Wandoo, York gum and Rock Sheoak habitats.

Based on the composition, structure and condition of the vegetation assessed, Marri habitat within the Survey area was classified as moderate foraging value for Forest Red-tailed Black Cockatoo.

The key results from the Black cockatoo habitat survey were:

- 0.29 ha of moderate quality Carnaby's Cockatoo foraging habitat recorded within the Survey area;
- 0.44 ha of low to moderate quality Carnaby's Cockatoo foraging habitat recorded within the Survey area;
- 0.29 ha of moderate quality Forest Red-tailed Black Cockatoo foraging habitat recorded within the Survey area (occurring in the same habitat as the moderate quality Carnaby's Cockatoo foraging habitat).

Suitable foraging habitat for both Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo is present within the Survey area. This is largely in the form of large Marri and Wandoo retained within the road reserve. Other secondary food sources (shrubs) are largely absent due to historical clearing and weed invasion. Given this, the quality of foraging was scored low to moderate and moderate.

As the foraging habitat within the Survey area represents less than 0.01% of the total remnant vegetation within the local area (15 km radius), the significance of the food source is considered low.

3.4 Black Cockatoo hollow assessment

Tony Kirkby was commissioned to undertake an assessment of a known nesting tree, last surveyed in 2018, at Bindoon Moora Road at SLK 28.92. The assessment was undertaken on the 5 September 2021.

Section 3.4.1 contains the summary of the assessment.

3.4.1 Summary of Black Cockatoo hollow assessment

The tree contains two hollows, both of which show chewing at the entrance. The hollows are approximately 1 m apart and are likely to lead to the same nest chamber. Judging from the chewing at the entrances the hollow is still viable and was probably used in the last breeding season in 2020 - 2021.

3.5 Dieback Survey

Glevan Consulting were commissioned to undertake a Phytophthora Dieback occurrence assessment of Bindoon-Moora Road between SLK 26.4 and 30.6.

Section 3.5.1 contains the summary of the survey.

3.5.1 Summary of dieback survey

- No Phytophthora Dieback infestations were observed during the assessment. A protectable uninterpretable area comprising 3.2 ha and one unprotectable uninterpretable area, comprising 9 ha were identified and mapped. An unprotectable uninfested area comprising 0.3 ha was also identified and mapped. The remaining 20.6 ha was excluded from the assessment due to being degraded or void of vegetation;
- Several areas exhibiting evidence of vegetation decline were observed within the study area. The decline was characterised by clustered or scattered *Banksia sessilis* and *Banksia squarrosa* deaths and was not consistent with that typically associated with Phytophthora Dieback. Two of these areas were sampled and both produced a negative result;
- The majority of the study area was classified as excluded and unprotectable due to being degraded or devoid of vegetation. This includes the section adjacent to Lake Wannamal Nature Reserve, which featured vegetation dominated by *Allocasuarina huegeliana* with little or no understorey. It was also noted that there is a train line running parallel to Bindoon-Moora Road which effectively acts as a barrier and would almost certainly prevent the spread of disease (should it be present) from the proposal area into the nature reserve;
- An unprotectable uninfested area and an unprotectable uninterpretable area were mapped during the assessment. The uninfested area was only 0.3 ha in size and not contiguous with a larger area of uninfested vegetation. The uninterpretable area was too narrow to be considered protectable; and
- There are 2 Clean on Entry (COE) points, associated with protectable uninterpretable area located within the study area. Vehicles and machinery will need to be inspected and cleaned where necessary, prior to entering the protectable areas.

4 VEGETATION DETAILS

4.1.1 Regional Vegetation Description

The Proposal area lies within the Mogumber System of the Dale Botanical Subdistrict and was mapped as 'Marri and/or Wandoo woodland (E. *calophylla-E. wandoo*)' (Beard, 1981), where Marri-Wandoo woodland occupied the plateau and upper slopes, with York Gum (*Eucalyptus loxophleba*) on the lower slopes. On lateritic ridges and breakaways, woodlands tend to open out with the development of a dense sclerophyllous understorey, mostly dominated by Banksia spp. (formerly Dryandra spp.).

The Proposal area comprises approximately 5 trees (0.015 ha) of native vegetation. CoTerra (2020) identified three vegetation units in the Proposal area, as described below:

- Cc - C*orymbia calophylla* open forest over *Acacia saligna* tall open shrubland over *Xanthorrhoea preissii* open shrubland
- El - *Eucalyptus loxophleba* subsp. *loxophleba* low woodland with *Melaleuca viminea* subsp. *viminea* scattered shrubs
- ErCo - *Eucalyptus rudis* subsp. *rudis* scattered trees over *Casuarina obesa* low closed forest over *Melaleuca viminea* subsp. *viminea* scattered tall shrubs **Ehrharta longiflora, *Bromus diandrus* closed grassland.

The condition of the mapped vegetation units listed above, ranged from 'Degraded' for the El and ErCo units and 'Good to Degraded' for the Cc unit.

Tables 2 and 3 provide details of the Pre-European Vegetation Association with the Proposal area and the remaining extents of this association.

Table 2. Summary of Proposal area's Mapped Pre-European Vegetation Associations

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 4 described as a Medium woodland; marri & wandoo' (Government of Western Australia, 2019).	Clearing of up to 0.015 ha for seal widening on Bindoon-Moora.	Degraded to Good-Degraded condition (EPA 2016)	Vegetation description and condition determined from CoTerra (2020).

Table 3. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 4	**Statewide**	1,054,279	284,102	26.96	23.85
	IBRA Bioregion Jarrah Forest	1,022,712	277,087	27.09	23.81
	IBRA Sub-region Northern Jarrah Forest	614,200	197,903	32.22	30.56
	Local Government Authority Shire of Chittering	54,209	13,971	25.77	4.88

4.1.2 Vegetation Complexes and Representation

Vegetation Complexes within the Proposal area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Native vegetation complexes as described by Heddle et al. (1980) within the Proposal area comprise:

- Wannamal Complex: Dandaragan Plateau- Lateritic Uplands: ('Mixture of low shrubland of *Melaleuca* spp. and open woodland of *Eucalyptus wandoo – E. loxophleba'*).

Table 4. Vegetation Complexes (Heddle/Mattiske) within the Proposal area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Wannamal Complex	2,492	1,263	50.70

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the Proposal's proposed clearing 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 proposed clearing is not or not likely to be at variance with one or more of the 10 Clearing Principles.

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

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

Vegetation Units and Condition

The Proposal requires the clearing of 0.015 ha of native vegetation (5 trees) along both sides of Bindoon Moora Road in the Shire of Chittering. Coterra (2020) identified three vegetation units, described as follows:

- Cc - *Corymbia calophylla* open forest over *Acacia saligna* tall open shrubland over *Xanthorrhoea preissii* open shrubland;
- El - *Eucalyptus loxophleba* subsp. *loxophleba* low woodland with *Melaleuca viminea* subsp. *viminea* scattered shrubs;
- ErCo - *Eucalyptus rudis* subsp. *rudis* scattered trees over *Casuarina obesa* low closed forest over *Melaleuca viminea* subsp. *viminea* scattered tall shrubs **Ehrharta longiflora, *Bromus diandrus* closed grassland.

CoTerra (2020) assessed the condition of these vegetation units, with the El and ErCo units considered to be in a 'Degraded' condition and the Cc unit considered to be in a 'Degraded to Good' condition. The results of the assessment are summarised below:

- 0.012 ha of vegetation in a 'Degraded' condition; and
- 0.003 ha of vegetation in a 'Good to Degraded' condition.

On 5 July 2022, a site assessment of the five trees by a Main Roads Senior Environmental Officer determined that all of the trees are in a Completely Degraded to Degraded condition, due to the absence of native under-storey/mid-storey vegetation adjacent to each of the trees, and the abundance of introduced weed species.

According to the Main Roads GIS layer, the Proposal area is not located within an Environmentally Sensitive Area (ESA).

Threatened and Priority Ecological Communities and Flora Species

Five Threatened and Priority Ecological Communities were mapped as occurring in the desktop Study area, which consisted of:

- Banksia Dominated Woodlands of the Swan Coastal Plain – BC Act (Priority 3), EPBC listed (Endangered);
- Banksia ilicifolia woodlands – BC Act (Priority 3), EPBC listed (Endangered);
- Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs – BC Act (Priority 1), EPBC listed (Endangered);
- Herb rich saline shrublands in clay pans – BC Act (Vu), EPBC listed (Endangered); and
- Swan Coastal Plain *Banksia attenuata - Banksia menziesii* woodlands – BC Act (Priority 3), EPBC listed (Endangered).

CoTerra (2020) did not identify any vegetation representative of a TEC or PEC within the Proposal area. The Proposal is not expected to impact on any TEC or PEC occurrence within the local area.

CoTerra reported 89 significant flora species were likely to occur within a 10 km study area. A detailed flora and vegetation survey, including targeted searches for significant species was undertaken by Coterra and identified one priority species, *Synaphea rangiferops* (P2) in the Bindoon Moora Road SLK 26.2 and 30.8 survey area, with the closest *Synaphea rangiferops* individual being recorded 350m south of Tree 1.

No threatened flora species were recorded within the Proposal area and based on the survey effort and assessment of habitats present, none are considered likely or possible to occur.

Reserves and Linkages

According to the DBCA Lands and Waters GIS layer (Figure 5), two conservation reserves occur close to the Proposal area - Betts Nature Reserve (Class A) occurs 700m south of Tree 1, and Lake Wannamal Nature Reserve (Class A) occurs 200m north west of Tree 2 and 80m west of Trees 3-5. Both reserves occur on the western side of the rail reserve that borders the road reserve. As works are proposed to remain within the road reserve maintenance zone, then it is unlikely that the Proposal will impact on these reserves.

It is considered likely that the vegetation within these reserves is in a better condition than that within the Proposal area and is representative of higher quality remnant native vegetation within the local area.

CoTerra (2020) identified that Bindoon Moora Road provides a north-south linkage through an area that has been subject to clearing for farmland. The Proposal will necessitate the removal of five trees from the maintenance zone within the road reserve. Considering the relatively small amount of vegetation to be removed, and noting the presence of both Betts and Lake Wannamal Nature Reserve, it is unlikely that the Proposal will significantly impact the function of Bindoon Moora Road reserve as a linkage within the regional area.

Fauna

The desktop assessment identified 22 significant fauna species as potentially occurring within the Proposal area. Overall fauna habitat values within the survey area have been severely compromised by the removal of a significant proportion of the original native vegetation and the degradation of remnant patches (Harewood 2018). Black Cockatoos, specifically Forest Red-tailed Black Cockatoo (FRTBC) and Carnaby's Cockatoo, were the only conservation significant species recorded within the survey area (Harewood, 2018).

The Proposal area is within the modelled distribution and breeding range of Carnaby's Cockatoo, but outside of the modelled distribution of FRTBC.

The Proposal area contains one suitable DBH tree (those greater than 500 mm DBH) which will be removed (Tree 1 at 28.18 SLK). Harewood (2018) recorded 78 suitable DBH trees within the survey area, of which four had hollows assessed as suitable for use by black cockatoos. One of these trees (a Wandoo at 28.92 SLK) had a large hollow supporting a breeding pair of Carnaby's Cockatoo – this tree will not be removed. No other trees within the Proposal area were assessed as containing suitable hollows.

The Proposal will require the clearing of 0.015 ha and 0.003 ha of moderate to low-moderate quality foraging habitat for Carnaby' Cockatoo and FRTBC, respectively. The foraging habitat comprises of:

- 0.003 ha of Marri (*Corymbia calophylla*) - moderate quality foraging;
- 0.002 ha of Wandoo (*Eucalyptus wandoo),* - low-moderate quality foraging, and
- 0.010 ha of York gum (*Eucalyptus loxophleba*). - low-moderate quality foraging.

Foraging evidence was observed only within the small occurrences of Marri within the survey area and were attributed to FRTBC (Harewood, 2018). No foraging evidence was recorded by Western Ecological (2021). Strategen JBS&G (2021) reported that the significance of the food source in the survey area is considered low. Strategen JBS&G did not record any evidence of any other fauna species of conservation significance utilising the survey area during its site reconnaissance survey. Further, the Main Roads Senior Environmental Officer did not observe any Threatened or Priority Fauna during their site inspection on 5 July 2022.

Overall fauna habitat values within the Proposal area have been severely compromised by the removal of a significant proportion of the original native vegetation and the degradation of remnant patches. Natural attributes have been diminished and much of the Proposal area would now only be utilised by generally common and widespread fauna species, with the exception of black cockatoos, with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats.

Assessed Outcome:
Proposal clearing is not likely to be at variance to this Principle.

Methodology
CoTerra (2020)
DBCA GIS Shapefiles
Government of WA (2019)
Harewood (2018)
Strategen JBS&G (2021)

(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

Harewood (2018) identified a broad mix of fauna habitats comprised of a mosaic of wandoo (*Eucalyptus wandoo*, marri (*Corymbia calophylla*) woodland, York gum (*Eucalyptus loxophleba*) and sheoak (A*llocasuarina* spp.) woodland, sheoak (*Allocasuarina* spp.) and jam (*Acacia acuminata*) woodland, sheoak (*Allocasuarina* spp.) low open forest and some wetland areas with paperbark (*Melaleuca* spp.) low open woodland/scrub.

Desktop assessment identified 203 fauna species occurring within the desktop Study area, comprised of 18 mammals (including six bat species), 111 bird, 63 reptile and 11 frog species. Of these species identified, 22 are of conservation significance. Of the species identified only Carnaby's Cockatoo and FRTBC were recorded in the survey area (Harewood, 2018; Western Ecological, 2021) and these are discussed further below. No evidence of any other fauna species of conservation significance utilising the survey area was found during the site reconnaissance survey. Harewood (2018) considered Peregrine Falcon (*Falco peregrinus*) as 'Possibly' occurring in the survey area. The Peregrine Falcon was not observed but it has the potential to utilise the air space associated with the Proposal area. Western Ecological (2021) also confirmed that the survey area is outside of the current documented distribution of the Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*).

Overall fauna habitat values within the survey area have been severely compromised by the removal of a significant proportion of the original native vegetation and the degradation of remnant patches. Natural attributes have been diminished and much of the proposal area would now only be utilised by generally common and widespread fauna species, with non-specific requirements which allow them to persist in disturbed/highly disturbed habitats (with the exception of black cockatoos discussed below) (Harewood, 2018).

As the Proposal area comprises of five trees, the likely habitat values primarily relate to avian fauna. Black cockatoos, specifically FRTBC and Carnaby's Cockatoo, were the only conservation significant species recorded within the survey area (Harewood, 2018).

Black Cockatoo

The Proposal area contains one suitable DBH tree (those greater than 500 mm DBH) which will be removed (Tree 1 at 28.18 SLK). Harewood (2018) recorded 78 suitable DBH trees within the survey area, of which four had hollows assessed as suitable for use by black cockatoos. One of these trees (a Wandoo at 28.92 SLK) had a large hollow supporting a breeding pair of Carnaby's Cockatoo – this tree will not be removed. None of the five trees within the Proposal area were assessed as containing hollows.

The Proposal will require the clearing of 0.015 ha and 0.003 ha of moderate to low-moderate quality foraging habitat for Carnaby' Cockatoo and FRTBC, respectively. The foraging habitat comprises of:

- 0.003 ha of Marri (*Corymbia calophylla*) - moderate quality foraging;
- 0.002 ha of Wandoo (*Eucalyptus wandoo),* - low-moderate quality foraging; and
- 0.010 ha of York gum (*Eucalyptus loxophleba*). - low-moderate quality foraging.

Foraging evidence was observed only within the small occurrences of Marri within the survey area and were attributed to FRTBC (Harewood, 2018). No foraging evidence was recorded by Western Ecological (2021). Strategen JBS&G (2021) reported that the significance of the food source in the survey area is considered low.

No evidence of any other fauna species of conservation significance utilising the survey area was recorded during the site reconnaissance survey.

The EPA (2019) identifies the importance of retaining foraging habitat which occurs in proximity to identified roosting and nesting habitat, noting individuals of Carnaby's Cockatoo may forage in areas up to 12 km from identified roosting and nesting habitats. When considered at the regional context, remnant native vegetation mapping (DPIRD, 2019) intersected with DBCA (2018) Carnaby's Cockatoo foraging areas data, indicates that more than 10,800 ha (3,149 ha Jarrah IBSA and 7,662 ha SCP IBSA) of mapped

Carnaby's Cockatoo foraging habitat occurs within 10 km of the Proposal area (Figures 3 and 5). Five nature reserves surround the Proposal area, namely:

- Betts Nature Reserve – located 80 m to the west of the Trees 3-5;
- Boonanarring Nature Reserve - located 10 km south west of the Proposal area;
- Lake Wannamal Nature Reserve - located 700m south of Tree 1;
- Mogumber Nature Reserve - located 6 km north of the Proposal area;
- Udumung Nature Reserve - located 11.5 km south-east of the Proposal area.

Clearing as a result of the Proposal represents a 0.0001% reduction in available foraging habitat within 12 km. It is considered likely that higher quality foraging habitat occurs within the five reserves in proximity to and within the local area. Furthermore, large areas of banksia woodland exist approximately 6 km north of the Proposal area, adjacent to Mogumber Road. A number of these sites have been utilised as offset sites. Considering this, the loss of 0.015 ha of moderate and low-moderate quality foraging habitat, and one suitable DBH tree with no known suitable hollows, will not lead to a significant decrease in the local black cockatoo population.

With regards to FRTBC, foraging residue attributable to this species has been recorded within the proposal area (Harewood, 2018). While noting this, it is considered that the clearing of 0.3 ha of vegetation is unlikely to result in a significant impact to the species. No known breeding for Forest Red-tailed Black Cockatoos was recorded within the Proposal area. The closest known breeding site is approximately 13 km west of the proposal area in the Boonanarring Nature Reserve (DPaW, 2015). While it is accepted that the Proposal area contains habitat suitable for foraging for FRTBC, its removal will not result in significant impact to the population.

Regional data records held by DBCA (2018) identify the nearest confirmed roosting site for Carnaby's Cockatoo is located 23 km east from the proposal area, on the northern edge of the Department of Defence Bindoon Training Area. Harewood (2018) in their assessment of the site did not observe any evidence of roosting within the Proposal area. Noting this, the Proposal will not impact on a night roosting site. Furthermore, given the distance of the Proposal area from the closest known roost site, the Proposal is unlikely to contain significant habitat supporting a roost.

In considering the above, foraging habitat to be cleared is not considered to be high quality or abundant. Although the presence of a confirmed nesting tree makes any foraging habitat surrounding that tree and within 6 km important in potentially supporting breeding success of Carnaby's Cockatoo, due to the minor nature of clearing and the amount of similar or better quality foraging habitat in the local area, clearing associated with the Proposal is unlikely to be at variance with this Principle.

Assessed Outcome:
Proposal clearing is not likely to be at variance to this Principle.

Methodology
CoTerra (2020)
DBCA GIS Shapefiles
EPA (2016, 2019)
Harewood (2018)
Strategen JBS&G (2021)

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

Proposed clearing is not at variance to this Principle

No threatened flora species were recorded within the Proposal area and based on the survey effort and assessment of habitats present, none are considered likely or possible to occur.

Assessed Outcome:
Proposal clearing is not at variance to this Principle.

Methodology
CoTerra (2020)
DBCA GIS shapefiles

(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 at variance to this Principle

CoTerra (2020) did not identify any vegetation in the Proposal area considered as representative of a State listed Threatened Ecological Community.

Assessed Outcome:
Proposal clearing is not at variance to this Principle.

Methodology
CoTerra (2020)
DBCA GIS shapefiles

(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

The Proposal is located within the north-western boundary of the Northern Jarrah Forest subregion of the Jarrah Forest biogeographic region. Vegetation Association 4 retains 27.0% of its pre-European extent at the Statewide scale, 27.09% at the IBRA bioregion scale, 32.22 at a Sub-region scale and 25.77% at a LGA level (Government of Western Australia, 2019) as shown in the tables below.

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).

At the local scale (10 km), approximately 37% (13,000 ha) of remnant native vegetation remains (Figure 4).

The vegetation within the Proposal area is further mapped as Heddle vegetation complex 'Wannamal' which retain approximately 50.7 per cent of its pre-European vegetation extent.

Summary of Proposal area's Mapped Pre-European Vegetation Association

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 4 described as a Medium woodland; marri & wandoo' (Government of Western Australia, 2019).	Clearing of up to 0.015 ha for seal widening on Bindoon-Moora.	Degraded to Good-Degraded condition (EPA 2016)	Vegetation description and condition determined from CoTerra (2020)

Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 4	**Statewide**	1,054,279	284,102	26.96	23.85
	IBRA Bioregion Jarrah Forest	1,022,712	277,087	27.09	23.81
	IBRA Sub-region Northern Jarrah Forest	614,200	197,903	32.22	30.56

	Local Government Authority Shire of Chittering	54,209	13,971	25.77	4.88

Previous granted clearing permits where the application area supported vegetation that retained less than 30% of its extent but was not considered to be a 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 6851 – Approximately 5 ha of vegetation in Degraded to Completely Degraded condition in a linear shape was not considered to be a significant remnant

The condition of the mapped Vegetation Association 4 in the Proposal area is Degraded to Completely Degraded. Vegetation in the Proposal area is not considered likely to comprise significant habitat for any ecological communities, but is likely to provide foraging habitat for black cockatoos. Given the minor extent of clearing, comprising of five trees adjacent to an existing road within the maintenance zone, it is also considered that clearing of 0.015 ha is unlikely to significantly impact connectivity within other remnant vegetation in the local area or reduce the capacity of the remaining vegetation within the local area to act as an ecological linkage.

The clearing for the Proposal is not likely to have a significant impact on the remaining extent of this Vegetation Association at the subregion, LGA or local (10km) level.

Assessed Outcome:
Proposal clearing is not likely to be at variance to this Principle.

Methodology
Aerial photography
CoTerra (2020)
DBCA ad DPIRD GIS Shapefiles
EPA (2016)
Government of Western Australia (2018)

(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 not likely to be at variance to this Principle

According to Main Roads GIS Watercourse layer (Figure 3), the closest records to a watercourse from each tree were:

Tree No.	SLK	Watercourse / distance from tree
1	28.18	minor non-perennial 400m south
2	29.72	minor non-perennial 300m west
3	29.88	minor non-perennial 300m west
4	29.95	minor non-perennial 190m north west
5	29.96	minor non-perennial 190m north west

Trees 2-5 intersect with a mapped Resource Enhancement Palusplain wetland (UFI12745 (Figure 3)), although the species of trees (Wandoo and York Gum) to be removed in this area are not characteristic of watercourse/wetland vegetation.

Coterra (2020) identified three vegetation units, described as follows:

- Cc - *Corymbia calophylla* open forest over *Acacia saligna* tall open shrubland over *Xanthorrhoea preissii* open shrubland;
- El - *Eucalyptus loxophleba* subsp. *loxophleba* low woodland with *Melaleuca viminea* subsp. *viminea* scattered shrubs;

- ErCo - *Eucalyptus rudis* subsp. *rudis* scattered trees over *Casuarina obesa* low closed forest over *Melaleuca viminea* subsp. *viminea* scattered tall shrubs **Ehrharta longiflora, *Bromus diandrus* closed grassland.

Although the El and ErCo vegetation units do feature a typical wetland species (ie *Melaleuca),* the trees to be cleared are not typical wetland species. Further, the trees to be cleared are located within the maintenance zone and have been assessed as being in a Degraded to Completely degraded condition.

Assessed Outcome:
Proposal clearing is not likely to be at variance to this Principle.

Methodology
CoTerra (2020)
DWER GIS shapefiles

(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 to this Principle

The Natural Resource Management risk mapping indicates the soil of the Proposal area has a low risk of water erosion, a moderate risk of wind erosion, a low to moderate risk of salinity, and a moderate to high water logging risk.

ASRIS mapping indicates that the Proposal area is located in an area with an extremely low probability of Acid Sulphate Soils.

Given the small area of clearing (0.015 ha), the isolated 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. As construction is proposed to occur in spring-summer, this will reduce the potential for waterlogging.

Accordingly, this Proposal **is not likely** to be at variance to this Principle.

Assessed Outcome:
Proposal clearing not likely to be at variance to this Principle.

Methodology
DPIRD Natural Resource Management Information (Accessed July 2022)

(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 likely to be at variance to this Principle

According to the DBCA Lands and Waters GIS layer (Figure 5), two conservation reserves occur close to the Proposal area - Betts Nature Reserve (Class A) occurs 700m south of Tree 1, and Lake Wannamal Nature Reserve (Class A) occurs 200m north west of Tree 2 and 80m west of Trees 3-5.

The Proposal area and the reserves are separated by an adjoining rail corridor that is vegetated on each side. It is unlikely that clearing associated with the Proposal will have either a direct or indirect impact on these reserves.

Glevan Consulting, in their assessment of dieback risk within the Proposal area stated that *It was also noted that there is a train line running parallel to Bindoon-Moora Road which effectively acts as a barrier and would almost certainly prevent the spread of disease (should it be present) from the project area into the nature reserve.*

In considering the above and noting that the Proposal will be subject to Main Roads standard management actions to ensure any risks to adjacent vegetation (via dust emissions or introduction/spread of weeds or dieback) are minimised as far as practicable, it is not likely that the proposed clearing will be at variance to this Principle.

Assessed Outcome:
Proposal clearing not likely to be at variance to this Principle.

Methodology
DBCA GIS shapefiles

(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 to this Principle

The Proposal area does not intersect with any mapped watercourses. The Proposal will require clearing of five trees located within the existing maintenance zone.

Given the degraded nature of the vegetation present, the clearing of this small amount of vegetation is unlikely to cause a deterioration in the quality of surface or underground water. In addition, Contract documentation will incorporate management actions to ensure potential indirect and short-term impacts, such as sedimentation and erosion, are managed.

The Proposal area is more than 10km from a Public Drinking Water Source Area, 1.2km east of a surface water area proclaimed under the RIWI Act, and immediately east of the Gingin Groundwater Area. Proposal activities are unlikely to impact on these areas as works will remain within the maintenance zone.

Dewatering is not proposed and no change to groundwater level or quality is anticipated from the removal of the trees. Standard operational controls will be implemented with regard to potential spill risks.

Given no dewatering or major drainage modifications are likely to be required and the scale of clearing is relatively minor and linear in nature, no deterioration of surface or underground water levels or quality is expected to result from clearing.

Assessed Outcome:
Proposal clearing not likely to be at variance to this Principle.

Methodology
DWER GIS shapefiles
CoTerra (2020)

(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 to this Principle

This Proposal proposes to clear 0.015 ha of vegetation over an approximately 2 km stretch of road.

Wannamal (10 km east of the Proposal area) receives an average rainfall of 580mm per year (Bureau of Meteorology Australia, 2022), predominantly from May to October.

The Natural Resource Management risk mapping indicates the flood hazard is low for tree 1, but high for trees 2-5, due to their location over the mapped Resource Enhancement Palusplain wetland.

According to DPIRDs Natural Resource Soil Information, Tree 1 is located in the Yarawindah System, described as dissected lateritic plateau with rolling to undulating low hills and undulating rises; loamy gravel, loamy earth, loamy duplex, some rock; weathered schist and some gneiss. Trees 2-5 are located in the Wannamal System, described as alluvial plain and fans; Brown and red loamy earths, Yellow/brown sandy duplexes, loamy duplexes. Both of these soil systems do have some infiltration capacity, thus reducing the risk of flooding.

Given the minor nature of the clearing, the moderate annual rainfall, the relatively flat topography of the Proposal area and that works are proposed to be conducted during the spring-summer months, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding. The clearing of five trees will not result in an increase the incidence or intensity of flooding events.

Assessed Outcome:
Proposal clearing not likely to be at variance to this Principle.

Methodology
DPIRD Natural Resource Management Information (Accessed July 2022)

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*
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles. Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to: i. a minor non-perennial watercourse(s); ii. a wetland(s) classed as a multiple use management category wetland(s); and/or iii. a wetland that is not a defined wetland; the preparation of an Assessment Report, as required by condition 6(e), is not required.	**No**	No further action required.
2. 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.	**No**	No further action required.
3. The project involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
4 a. Proposal is within Region that: - Has rainfall greater than 400mm and - Is South of the 26th parallel and - Works are in 'Other than dry conditions' and - Works have potential for **uninfested** areas to be impacted	**No**	Glevan Consulting (2021) has undertaken a dieback assessment. No known occurrences of dieback where observed. Dieback management measures will be incorporated in Contract documentation.
4b. Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	**No**	No further action required.
5. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	**No**	No further action required.
6. 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.	**No**	No further action required.

7 STAKEHOLDER CONSULTATION

Main Roads is not required to undertake stakeholder consultation in accordance with CPS 818/15 Condition 8.

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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10 APPENDICES

Appendix	Title
Appendix 1	Constraints Mapping

Appendix 1: Constraints Mapping

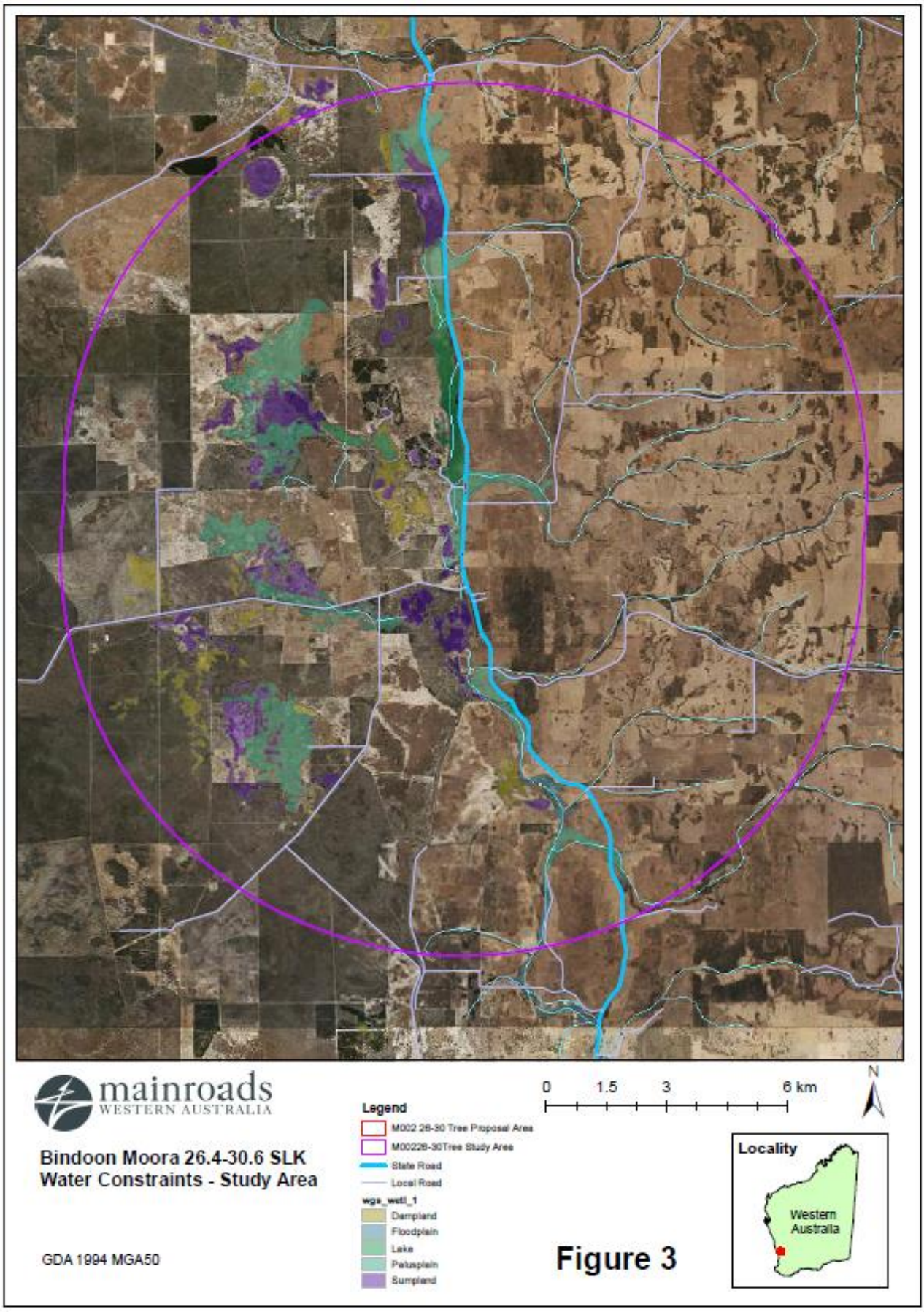

Figure 3: Water Constraints

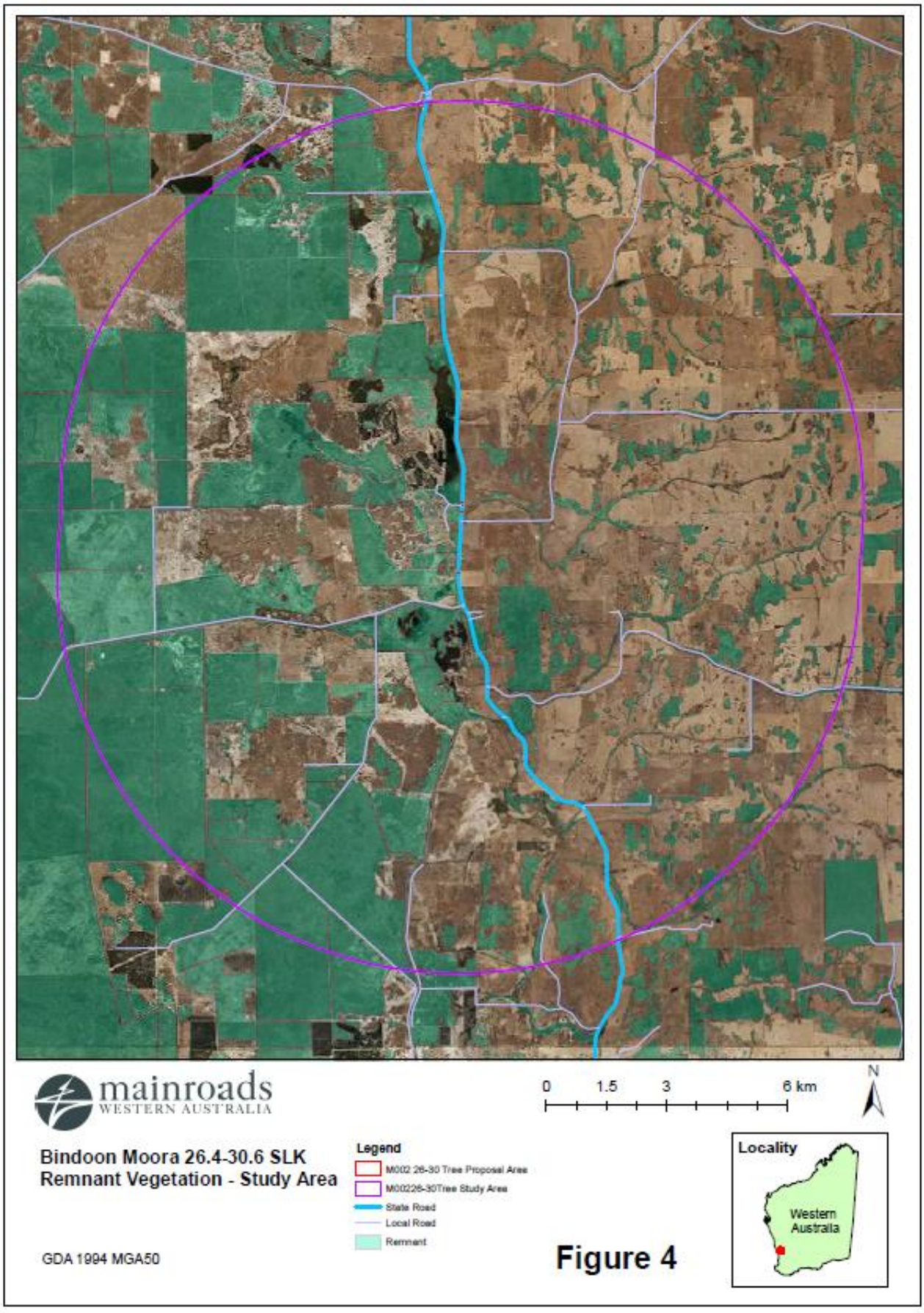

Figure 4: Remnant Vegetation

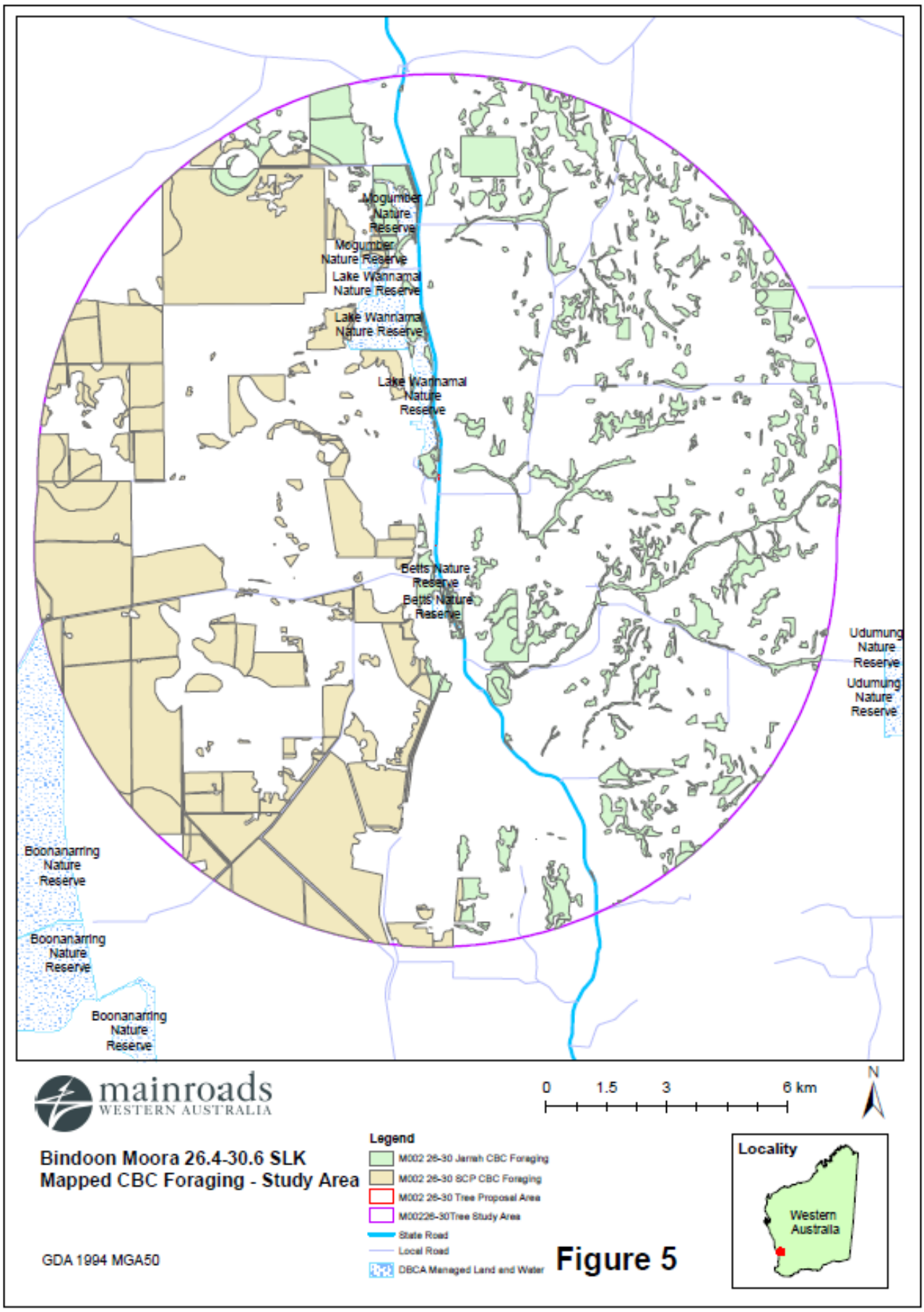

Figure 5: DBCA Reserves and Carnaby's Black Cockatoo Foraging Habitat