Native Vegetation Clearance

Wimmera Highway Abattoir Upgrade Data Report

Clearance under the *Native Vegetation Regulations 2017*

15 October 2021

Prepared by Hayley Merigot – EBS Ecology (NVC Accredited Consultant)

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Version 3

Prepared by EBS Ecology for Greenhill Pty Ltd

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Cover photograph: Photo looking west along Wimmera Highway towards the abattoir.

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Glossary and abbreviations

Aus.	Australia
BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia (maintained by DEW)
DAWE	Department of Agriculture, Water and the Environment (Commonwealth)
DEW	Department for Environment and Water (South Australia)
EBS	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
Greenhill	Greenhill Pty Ltd
ha	Hectare(s)
IBRA	Interim Biogeographical Regionalisation of Australia
km	Kilometre(s)
NatureMaps	Initiative of DEW that provides a common access point to maps and geographic information about South Australia's natural resources in an interactive online mapping format
NPW Act	*National Parks and Wildlife Act 1972*
NV Act	*Native Vegetation Act 1991*
NVC	Native Vegetation Council
PMST	Protected Matters Search Tool (under the EPBC Act; maintained by DAWE)
Project	Wimmera Highway Abattoir Intersection Upgrade
Project Area	Abattoir Intersection Upgrade on Wimmera Highway, Hynam
SA	South Australia(n)
Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches
SEB	Significant Environmental Benefit
SRZ	Tree structural root zone
sp.	Species
ssp.	Sub-species
STAM	Scattered Tree Assessment Method
TEC	Threatened Ecological Community
TPZ	Tree Root Protection Zone

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Application information

Table 1. Application details.

Applicant:	Department for Infrastructure and Transport (DIT)		
Key contact:			
Landowner:	The crown		
Site Address:	Naracoorte Abattoir intersection upgrade along the Wimmera Highway, Hynam		
Local Government Area:	Naracoorte Lucindale Council	**Hundred:**	Jessie
Title ID:	Road reserve	**Parcel ID**	Road reserve

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance is required for the upgrade of the Naracoorte Abattoir intersection on the Wimmera Highway to facilitate safer traffic movement.
Native Vegetation Regulation:	Regulation 12, Schedule 1: Clause 32 – Works on behalf of Commissioner of Highways
Description of the vegetation under application:	0.4670 hectares (ha) of native vegetation consisting of: • **A1**: 0.3120 ha of *Eucalyptus camaldulensis* closed woodland; • **A2**: 0.0104 ha of *E. camaldulensis* and *E. leucoxylon* open woodland with exotic understorey; and • **A3**: 0.0605 ha of *E. leucoxylon* and *E. camaldulensis* woodland. **118 scattered trees to be cleared**, consisting of: • 90 *E. camaldulensis*, • 28 *E. leucoxylon*.
Total proposed clearance – area (ha) and/or number of trees:	0.4670 ha of native vegetation and 118 scattered trees are proposed to be cleared.
Level of clearance:	Level 4 (escalated from level 3)
Overlay (Planning and Design Code):	Native Vegetation Overlay
Map of proposed clearance area:	
Mitigation Hierarchy:	***Avoidance*** - Avoidance of vegetation for the widening of the road is limited to the safety standards for the upgrade of the intersection. Where

	possible, the Project has limited the design plans to avoid vegetation. For example, although 14 trees (7 scattered trees, and 7 in native vegetation patch) that are important habitat for Red-tailed Black-Cockatoos are proposed to be cleared, 20 sensitive trees have been avoided based on early design reviews and engagement between EBS and DIT (see Appendix 1 for sensitive trees within the Project Area). ***Minimization –*** The intersection has been designed to impact on the minimum amount of vegetation practical as allowed by safety requirements. Although not in the impact area, due to the presence of Threatened Ecological Communities that may occur within the construction area, measures will also be taken to ensure that no impact during construction will occur by avoiding the tree root protection zone (TPZ) and by ensuring the area is protected by fencing during construction where appropriate. Ensure that the design and construction method minimises impacts to all vegetation, avoiding the tree structural root zone (SRZ) as a priority, but also avoiding the TPZ wherever feasible. All vegetation removal and pruning works are to be undertaken by a suitably qualified arboricultural contractor and in accordance with *AS 4373 Pruning of Amenity Trees*. ***Rehabilitation or restoration –*** The intersection upgrade is permanent land clearance that is unlikely to be rehabilitated or restored. ***Offset –*** The adverse impacts to native vegetation that cannot be avoided or minimised will be offset through the achievement of a Significant Environmental Benefit that outweighs the proposed impact.
SEB Offset proposal	Payment of **$95,857.00** which includes an administration fee of **$4,997.28** (including GST).

1. Purpose of clearance

1.1. Description

EBS Ecology (EBS) were engaged by Greenhill Pty Ltd on behalf of the Department for Infrastructure and Transport (DIT) to deliver the planning and design works for the Naracoorte Abattoir intersection upgrade along the Wimmera Highway, Hynam (the Project). The Project involves the clearance of 0.467 ha of vegetation and 118 scattered trees along the Wimmera Highway (Figure 1). The vegetation consists of 0.467 ha of highly modified Woodland/ forest vegetation and the scattered trees include *E. camaldulensis* (River Red Gum) and *E. leucoxylon* (South Australian Blue Gum).

Objectives

EBS were engaged to undertake a flora and fauna assessment for the proposed intersection upgrade including the following project components:

- Undertake a desktop assessment of the likelihood of occurrence and status of threatened flora and fauna protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *National Parks and Wildlife Act 1972* (NPW Act);
- Assess native vegetation within the Project Area for clearance using the Native Vegetation Council (NVC) endorsed Bushland Assessment Method (BAM) and Scattered Trees Assessment Method (STAM); and
- Calculate the Significant Environmental Benefit (SEB) offset requirements based on the impact footprint.

This report presents findings of the desktop assessment; in addition to results of the BAM and STAM required for assessing trees proposed for clearance under the *Native Vegetation Regulations 2017*.

1.2. Background

Current and surrounding land use

The area to the north of the Project Area is predominantly private land associated with the Teys abattoir and is used for intensive livestock management (feedlot and holding pens). The area to the south of the Project Area is mostly privately owned farming land, with a residence located adjacent to Burgess Rd and a quarry and loading facility behind that to the south.

The Project Area consists predominantly of highly modified woodland/forest vegetation with little or no understorey components along the Wimmera Highway. Small areas of planted amenity vegetation were recorded on the northern side of the Wimmera Highway within the Teys abattoir site, however, most vegetation to be removed is on public road reserve.

Administrative Boundaries

The Project Area occurs within the Naracoorte Lucindale Council Area, Limestone Coast Landscape Management Region, Jessie Hundreds and Robe County.

Bioregions

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The bioregions are further refined into subregions and environmental associations. The Project Area is located in the Murray Darling Depression IBRA Bioregion, Wimmera IBRA Subregion and Kybybolite IBRA Environmental Association.

Approximately 4% (132,999 ha) of the Wimmera IBRA Subregion and approximately 4% (2841 ha) of the Kybybolite IBRA Environmental Association is mapped as remnant native vegetation. Of this 10% (609 ha) and 15% (454 ha) is formally conserved.

1.3. General location map

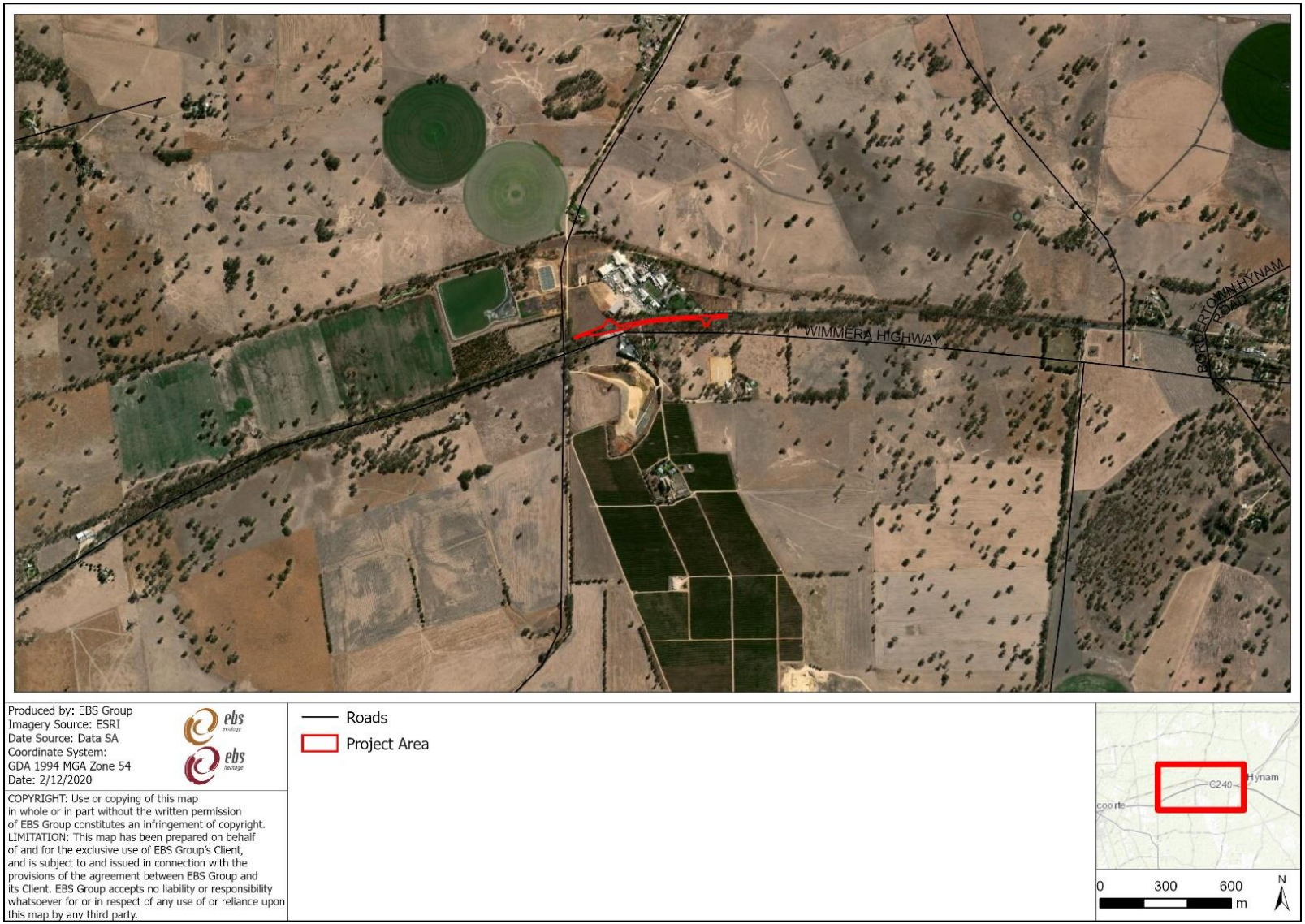

Figure 1. Location and extent of the Project Area along the Wimmera Highway in the south east of South Australia.

1.4. Details of the proposal

The proposed clearance area for the Naracoorte Abattoir Intersection upgrades include the removal of 0.467 ha of native vegetation and 118 scattered trees along the Wimmera Highway. The Project Area extends along the Wimmera Highway on either side of the road from the junction of Biggins Rd, to approximately 600 metres (m) past the Naracoorte abattoir (Figure 1).

1.5. Approvals <u>required</u> *or* <u>obtained</u>

Native Vegetation Act 1991 **(NV Act) -** Where the NV Act applies, native vegetation must not be cleared unless approval is granted by the Native Vegetation Council in accordance with *Section 29* of the Act or it is permitted under Division 5 of the *Native Vegetation Regulations 2017*. This legislation is principally in place to provide incentives and assistance for the preservation and enhancement of native vegetation, to control the clearance of native vegetation and establish SEB (offset) areas or payments to be achieved to offset the clearance.

Native vegetation refers to any naturally occurring local plant species that is indigenous to South Australia, from small ground covers and native grasses to large trees and water plants. It also includes naturally occurring regrowth and in certain circumstances, dead trees (DEW, 2020). Regardless of the species, native vegetation protected under the NV Act does not include planted specimens.

Environment Protection and Biodiversity Conservation Act 1999 **(EPBC Act)** - The EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000* provide a legal framework to protect and manage Nationally and Internationally important flora, fauna, ecological communities and heritage places – defined in the Act as Matters of National Environmental Significance (MNES).

Any action that has, will have, or is likely to have a significant impact on MNES requires referral under the EPBC Act. Substantial penalties apply for undertaking an action that has, will have, or is likely to have a significant impact on a MNES without approval.

Planning, Development and Infrastructure Act 2016 **(DPI Act) –** The DPI Act repeals the *Development Act 1993* and provides for matters that are relevant to the use, development and management of land and buildings, including by providing a planning system to regulate development within the State, rules with respect to the design, construction and use of buildings, and other initiatives to facilitate the development of infrastructure, facilities and environments that will benefit the community.

National Parks and Wildlife Act 1972 **(NPW Act) -** Native plants and animals in South Australia are protected under the NPW Act. It is an offence to take a native plant or protected animal without approval. Threatened plant and animal species are listed in Schedules 7 (Endangered species), 8 (Vulnerable species) and 9 (Rare species) of the Act. Persons must not:

- Take a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve or any other Crown land;
- Take a native plant of a prescribed species on private land;
- Take a native plant on private land without the consent of the owner (such plants may also be protected by the NV Act);

- Take a protected animal or the eggs of a protected animal without approval;
- Keep protected animals unless authorised to do so; and
- Use poison to kill a protected animal without approval.

Conservation rated flora and fauna species listed on Schedules 7, 8, or 9 of the NPW Act may occur within the Project Area. Persons must comply with the conditions imposed upon permits and approvals.

Landscape South Australia Act 1991

The *Landscape South Australia Act 2019* replaces the NRM Act, which enables the establishment of new regional landscape boards and reform natural resource management in South Australia. The aim is to deliver effective water management, pest plant and animal control, soil and land management and support for broader sustainable primary production programs. The new Act was assented to by the Governor of South Australia in November 2019 and came into effect on July 1 2020.

- transport of declared weeds under the *Landscapes South Australia Act 2019*, and
- *Aboriginal Heritage Act 1988* if any sites, objects or remains are uncovered during the works.

Other legislative approvals may be required.

1.6. Native Vegetation Regulation

The Project is considered to be permitted under the following regulation:

Regulation 12(32)—Works on behalf of Commissioner of Highways

Clearance of vegetation incidental to work being undertaken by or on behalf of the Commissioner of Highways (other than repair or maintenance work of a kind referred to in Part 1 clause 2).

2. Method

2.1. Desktop assessment

A desktop assessment was undertaken to determine the potential for any threatened flora and fauna species, and Threatened Ecological Communities (TECs) (both Commonwealth and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

2.1.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 21 July 2020 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DAWE 2020). Only species and TECs identified in the PMST report that are likely or known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area.

2.1.2. BDBSA data extract

A data extract from the Biological Database of South Australia (BDBSA) was obtained from NatureMaps to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 21 July 2021; DEW 2020). The BDBSA is comprised of an integrated collection of species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia and the Australasian Wader Study Group, which meet the Department for Environment and Water's (DEW) standards for data quality, integrity and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

2.1.3. Likelihood of occurrence

The criteria for the likelihood of occurrence of threatened species within the Project Area are described in Table 3.

Table 3. Criteria for the likelihood of occurrence of threatened species within the Project Area.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provides limited habitat or feeding resources for the species. Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provide no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

2.2. Flora assessment

The flora assessment was undertaken by NVC accredited EBS Consultant Stuart Collard with assistance from Ecologist Brad Bianco from the 4th to the 6th August 2020 in accordance with the Bushland Assessment Method (BAM) (NVC 2020a) and Scattered Tree Assessment Method (STAM) (NVC 2020c).

2.2.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft *et al.* 2007, 2008a, 2008b, 2009; Milne and Croft 2012; Milne and McCallum 2012). The BAM used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with BDBSA records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheet. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

2.2.2. Scattered Tree Assessment Method

The STAM is derived from the *Scattered Tree Clearance Assessment in South Australia: Streamlining, Guidelines for Assessment and Rural Industry Extension* report (Cutten and Hodder 2002). The STAM is suitable for assessing scattered trees in the following instances:

- Individual scattered trees (i.e. canopy does not overlap). The spatial distribution of trees may vary from approaching what would be considered their original distribution (pre-European) through to single isolated trees in the middle of a paddock; or
- Dead trees (when a dead tree is considered native vegetation); or
- Clumps of trees (contiguous overlapping canopies) if the clump is small (approximately <0.1 ha); and
- For both scattered trees and clumps:
    - The ground layer comprises wholly or largely of introduced species;
    - Some scattered colonising native species may be present, but represent <5% of the ground cover; and
    - The area around the trees consists of introduced pasture or crops.

Details of the scattered tree Point Scoring System are outlined in the *Scattered Tree Assessment Manual* (NVC 2020c).

The numbers of uncommon and threatened scattered tree using fauna species entered into the Scattered Tree Scoresheet were calculated by cross-referring the BDBSA data extract (see Section 2.1.2) and the lists of scattered trees using fauna in the *Scattered Tree Assessment Manual* (NVC 2020). The resource use of each species identified was considered when determining each tree's suitability for threatened fauna species (e.g. species that only use hollows in scattered trees were only assigned to scattered trees containing hollows).

2.3. Fauna assessment

Fauna surveys were conducted in conjunction with the flora assessments along the site. All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the native vegetation assessment were recorded. Potential fauna refuge sites, such as hollows, were noted as an indication of availability of suitable habitat. Particular attention was paid to identifying habitat for threatened species. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound or sign) and habitat were recorded.

3. Assessment outcomes

3.1. Vegetation assessment

3.1.1. General description of the vegetation, the site and matters of significance

Three native vegetation associations were mapped as a result of the field survey at the site (Figure 2, Figure 3, Figure 4 & Figure 5):

- A1: *Eucalyptus camaldulensis +/- E. leucoxylon* Closed Woodland (Table 4);
- A2: Open *E. camaldulensis* Woodland +/- Exotic understorey (Table 5);
- A3: *E. leucoxylon +/- E. camaldulensis* Woodland (Table 6);

The Project Area consists of a gently undulating plain of tertiary sand/limestone, sand and clay with local ferruginous cappings and scattered low dunes. The vegetation across the Project Area consisted predominantly if highly modified woodland/forest vegetation with little or no understorey components. There were ten native and 35 exotic plant species recorded across the Project Area.

Vegetation Association A1 consists of mature trees with many trees with hollows present. The understorey is predominantly weed species. Vegetation Association A2 has a predominantly weedy understorey with some native grasses and small shrubs. There are individuals of *E. camaldulensis* scattered within the Project Area and a low number of trees with hollows present. Vegetation Association A3 consists of mature trees of *E. leucoxylon* and *E. camaldulensis* with minimal hollows and a high weed grass plant diversity and cover. No threatened flora species were detected during the field survey.

Thirty-five of the scattered trees to be impacted and an additional 44 trees within BAM A1 are considered to be important habitat trees for Red-tailed Black-Cockatoos (*Calyptorhynchus banksii graptogyne*) due to the presence of medium to large hollows or as they are a large tree (circumference > 2 m) with or without hollows (referred to as sensitive trees – see Appendix 1 for the locations of sensitive trees within the Project Area).

The scattered tree scoresheet and the photo file of scattered trees are provided in Attachments 1 & 5 respectively. The BAM scoresheets are provided as Attachments 2, 3 & 4.

3.1.2. Details of the vegetation associates/scattered trees proposed to be impacted

Table 4. Summary of VA1.

Vegetation Association	A1: *Eucalyptus camaldulensis +/- E. leucoxylon* Closed Woodland.				
					
General description	Predominantly *Eucalyptus sp.* woodland with exotic understorey.				
Threatened species or community	A desktop survey found several nationally and State listed fauna species which are likely to have preferred habitat within this vegetation association (See EBS 2020 for more details): **EPBC Act** - *Calyptorhynchus banksii graptogyne* (South-eastern Red-tailed Black-Cockatoo) (Endangered ; SA: Endangered); - *Delma impar* (Striped Legless Lizard) (Vulnerable; SA: Endangered); - *Grantiella picta* (Painted Honeyeater). **NPW Act** - *Trichosurus vulpecula* (Common Brushtail Possum) (SA: Rare); - *Myiagra inquieta* (Restless Flycatcher) (SA: Rare); - *Zanda funerea whiteae* (Yellow-tailed Black Cockatoo) (SA: Vulnerable).				
Landscape context score	1.12	**Vegetation Condition Score**	24.80	**Conservation significance score**	1.10
Unit biodiversity Score	30.55	**Area (ha)**	0.312	**Total biodiversity Score**	9.53

Table 5. Summary of VA2.

Vegetation Association	A2: Open *Eucalyptus camaldulensis* Woodland +/- Exotic understorey.				
					
General description	Predominantly Eucalypt Woodland with exotic understorey.				
Threatened species or community	A desktop survey found several Nationally and state listed fauna species which are likely to have preferred habitat within this vegetation association (see EBS 2020 for more details): **<u>EPBC Act</u>** - *Calyptorhynchus banksia graptogyne* (South-eastern Red-tailed Black-Cockatoo) (Endangered ; SA: Endangered); - *Delma impar* (Striped Legless Lizard) (Vulnerable; SA: Endangered); - *Grantiella picta* (Painted Honeyeater). **<u>NPW Act</u>** - *Trichosurus vulpecula* (Common Brushtail Possum) (SA: Rare); - *Myiagra inquieta* (Restless Flycatcher) (SA: Rare); - *Zanda funerea whiteae* (Yellow-tailed Black Cockatoo) (SA: Vulnerable).				
Landscape context score	1.14	**Vegetation Condition Score**	20.67	**Conservation significance score**	1.10
Unit biodiversity Score	25.92	**Area (ha)**	0.01037	**Total biodiversity Score**	0.27

Table 6. Summary of VA3.

Vegetation Association	A3: *Eucalyptus leucoxylon +/- E. camaldulensis* woodland.				
					
General description	Predominantly Eucalypt Woodland with exotic understorey.				
Threatened species or community	A desktop survey found several Nationally and state listed fauna species which are likely to have preferred habitat within this vegetation association (see EBS 2020 for more details): **<u>EPBC Act</u>** - *Calyptorhynchus banksia graptogyne* (South-eastern Red-tailed Black-Cockatoo) (Endangered ; SA: Endangered); - *Delma impar* (Striped Legless Lizard) (Vulnerable; SA: Endangered); - *Grantiella picta* (Painted Honeyeater). **<u>NPW Act</u>** - *Trichosurus vulpecula* (Common Brushtail Possum) (SA: Rare); - *Myiagra inquieta* (Restless Flycatcher) (SA: Rare); - *Zanda funerea whiteae* (Yellow-tailed Black Cockatoo) (SA: Vulnerable).				
Landscape context score	1.14	**Vegetation Condition Score**	19.66	**Conservation significance score**	1.10
Unit biodiversity Score	24.66	**Area (ha)**	0.0605	**Total biodiversity Score**	1.49

Table 7. Details of the 118 scattered trees proposed to be impacted.

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Comments
399	*Eucalyptus camaldulensis var camaldulensis*	1	12.6		48		0.45	
400	*Eucalyptus leucoxylon ssp leucoxylon*	1	11.2		28		0.29	
401	*E. leucoxylon ssp leucoxylon*	1	12		43		0.44	
402	*E. leucoxylon ssp leucoxylon*	1	1		1		0.03	
403	*E. leucoxylon ssp leucoxylon*	1	0.6		1		0.03	
404	*E. leucoxylon ssp leucoxylon*	1	7.5		29		0.22	
405	*E. camaldulensis var camaldulensis*	1	13	1	59		0.64	
406	*E. leucoxylon ssp leucoxylon*	1	11.8		34		0.36	
407	*E. leucoxylon ssp leucoxylon*	1	15.4		55		0.64	
409	*E. leucoxylon ssp leucoxylon*	1	11		32		0.32	
410	*E. camaldulensis var camaldulensis*	1	19.8	5	178		4.87	
411	*E. camaldulensis var camaldulensis*	1	16.2		62		0.99	
412	*E. leucoxylon ssp leucoxylon*	1	14.8		25		0.34	
413	*E. leucoxylon ssp leucoxylon*	1	3.7		7		0.06	
414	*E. leucoxylon ssp leucoxylon*	1	17.8		76		1.38	
415	*E. leucoxylon ssp leucoxylon*	1	13.8		51		0.55	
416	*E. leucoxylon ssp leucoxylon*	1	12.6		61		0.58	
417	*E. leucoxylon ssp leucoxylon*	1	10.8		20		0.21	
418	*E. leucoxylon ssp leucoxylon*	1	18.4		86		2.04	
419	*E. leucoxylon ssp leucoxylon*	1	6		17		0.12	
420	*E. leucoxylon ssp leucoxylon*	1	17.6	2	75		2.10	
421	*E. leucoxylon ssp leucoxylon*	1	11.2		23		0.24	
422	*E. leucoxylon ssp leucoxylon*	1	11.5		42		0.42	
423	*E. leucoxylon ssp leucoxylon*	1	16.8		70		1.23	
424	*E. leucoxylon ssp leucoxylon*	1	9.6		19		0.19	
425	*E. leucoxylon ssp leucoxylon*	1	4		7		0.06	
426	*E. leucoxylon ssp leucoxylon*	1	4.5		13		0.09	
427	*E. leucoxylon ssp leucoxylon*	1	5		11		0.08	
428	*E. leucoxylon ssp leucoxylon*	1	9.5		29		0.26	
429	*E. leucoxylon ssp leucoxylon*	1	4		8		0.06	
430	*E. leucoxylon ssp leucoxylon*	1	11		27		0.27	
431	*E. leucoxylon ssp leucoxylon*	1	11.6		21		0.24	
433	*E. camaldulensis var camaldulensis*	1	13.6		58		0.54	
434	*E. camaldulensis var camaldulensis*	1	14		69		0.63	
435	*E. camaldulensis var camaldulensis*	1	7.2		14		0.11	
436	*E. camaldulensis var camaldulensis*	1	12.2		23		0.24	
437	*E. camaldulensis var camaldulensis*	1	12.5		52		0.47	
438	*E. camaldulensis var camaldulensis*	1	5.5		8		0.07	
439	*E. camaldulensis var camaldulensis*	41	10.5		31		0.27	

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Comments
440	*E. camaldulensis var camaldulensis*	1	17.2	4	110	100	3.29	
441	*E. camaldulensis var camaldulensis*	1	17.6		108		1.99	
442	*E. camaldulensis var camaldulensis*	1	17	1	45		1.01	
443	*E. camaldulensis var camaldulensis*	1	8	1	47	100	0.50	
444	*E. camaldulensis var camaldulensis*	1	20.6	1	55		1.35	
445	*E. camaldulensis var camaldulensis*	1	19		61		1.13	
446	*E. camaldulensis var camaldulensis*	1	19.5		53		1.06	
447	*E. camaldulensis var camaldulensis*	1	9	1	43	100	0.41	
448	*E. camaldulensis var camaldulensis*	1	23	3	172		6.43	
449	*E. camaldulensis var camaldulensis*	1	13.6	3	80	100	1.24	
450	*E. camaldulensis var camaldulensis*	1	19.6	2	121		3.81	
451	*E. camaldulensis var camaldulensis*	1	17.6	2	62		1.25	
452	*E. camaldulensis var camaldulensis*	1	16	3	52	100	1.03	
453	*E. camaldulensis var camaldulensis*	1	14.8		49		0.52	
454	*E. camaldulensis var camaldulensis*	1	22.2		126		3.33	
455	*E. camaldulensis var camaldulensis*	1	20.8	2	64		1.99	
456	*E. camaldulensis var camaldulensis*	1	18.6	3	90		2.21	
457	*E. camaldulensis var camaldulensis*	1	22	1	83		2.49	
458	*E. camaldulensis var camaldulensis*	1	21	3	91		2.47	
459	*E. camaldulensis var camaldulensis*	1	21.9	2	121		3.68	
460	*E. camaldulensis var camaldulensis*	1	19.8	1	118		3.32	
461	*E. camaldulensis var camaldulensis*	1	18.5	3	120		2.54	
462	*E. camaldulensis var camaldulensis*	1	18.6		54		1.03	
463	*E. camaldulensis var camaldulensis*	1	15.4		37		0.45	
465	*E. camaldulensis var camaldulensis*	1	15.6		24		0.32	
467	*E. camaldulensis var camaldulensis*	5	13.2	1	68	100	1.07	
469	*E. camaldulensis var camaldulensis*	1	15.8		96		1.29	

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score	Comments
470	*E. camaldulensis var camaldulensis*	1	10.6		30		0.27	
471	*E. camaldulensis var camaldulensis*	1	9.4		27		0.22	
472	*E. camaldulensis var camaldulensis*	1	18.6	2	164		3.87	
473	*E. camaldulensis var camaldulensis*	1	10		59		0.44	
477	*E. camaldulensis var camaldulensis*	1	22.8	8	154		5.94	
479	*E. camaldulensis var camaldulensis*	1	19.2	8	140	100	4.07	
480	*E. camaldulensis var camaldulensis*	1	22.2		106		2.43	
481	*E. camaldulensis var camaldulensis*	1	19.2	2	110	100	2.50	
	TOTAL	**118**		**65**			108.22	

3.1.3. Site map showing areas of proposed impact

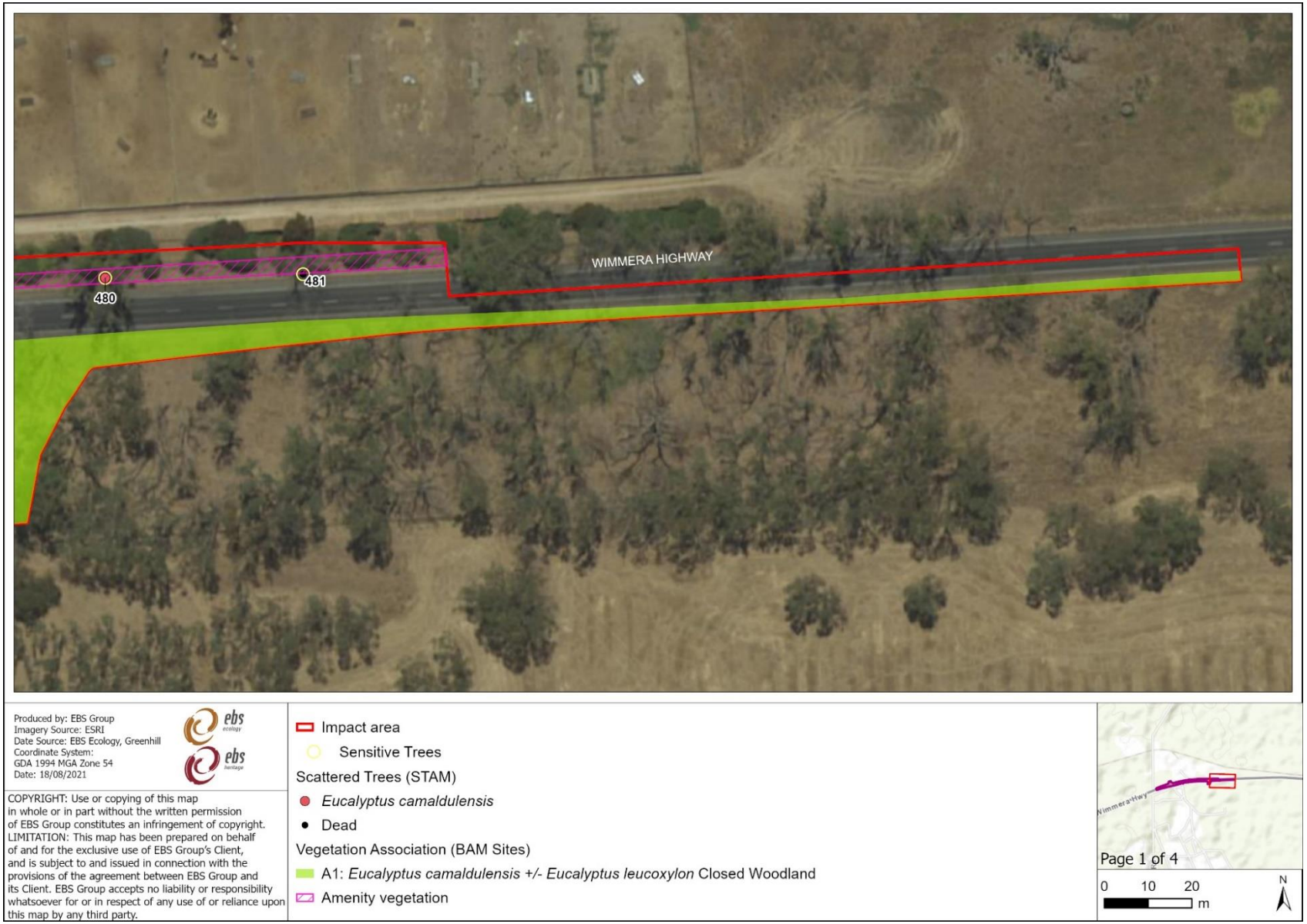

Figure 2. Vegetation within the Project Area comprising native patches, groups, and scattered trees (Map 1 of 4).

Figure 3. Vegetation within the Project Area comprising native patches, groups, and scattered trees (Map 2 of 4).

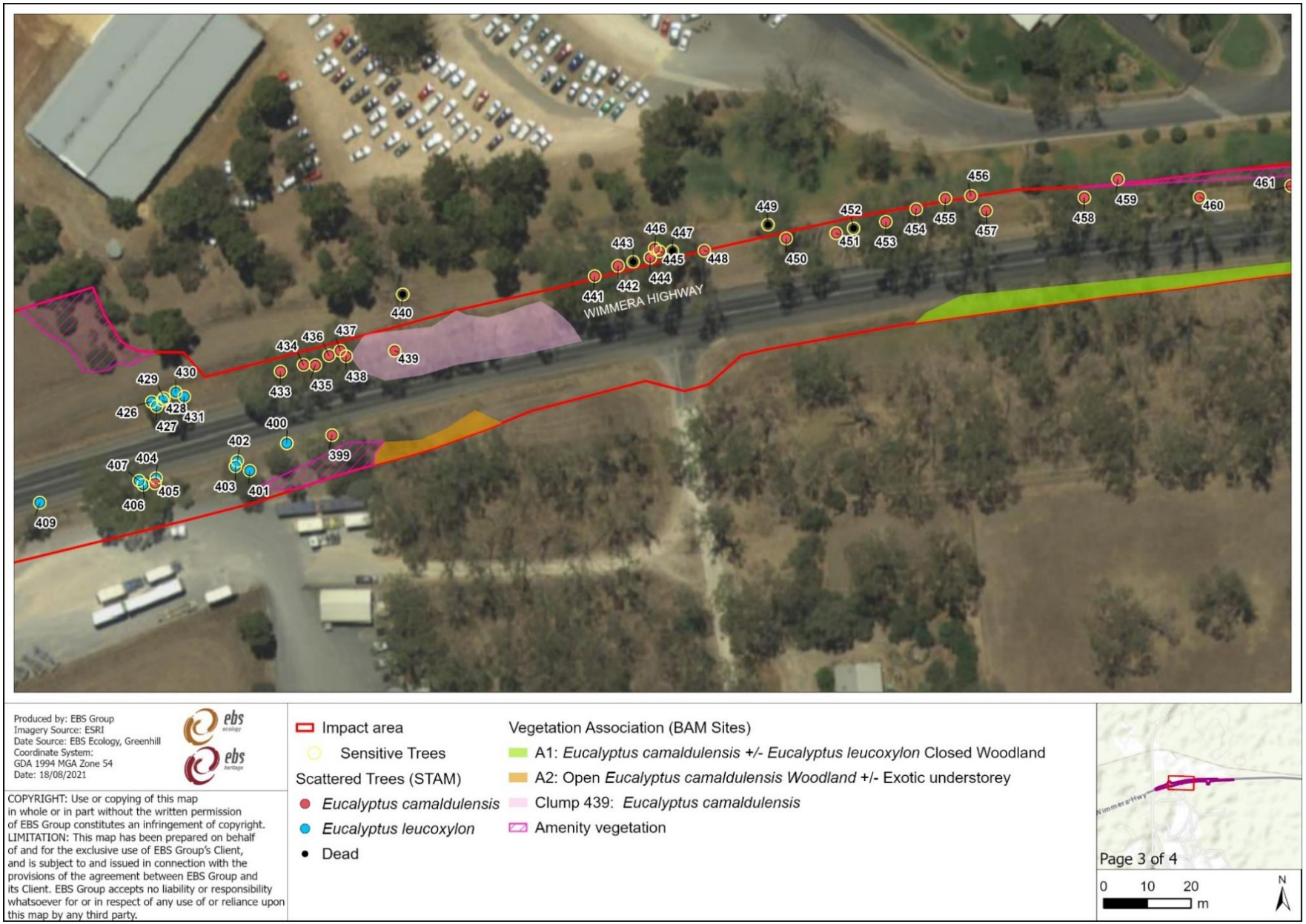

Figure 4. Vegetation within the Project Area comprising native patches, groups, and scattered trees (Map 3 of 4).

Figure 5. Vegetation within the Project Area comprising native patches, groups, and scattered trees (Map 4 of 4).

3.2. Threatened species assessment

3.2.1. Matters of National Environmental Significance

There are three MNES relevant to the Project Area, consisting of three Listed Threatened Ecological Communities (TEC):

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (Endangered);
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia (Endangered); and
- Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions (Plains Mallee Box TEC) (Critically Endangered).

The PMST report lists the three communities as "may occur" and are considered highly unlikely to occur within the Project Area as they are not present in the area or adjacent to the Project Area as indicated by the South Australian vegetation mapping (NatureMaps 2021) or the Project Area does not contain the relevant species that constitute any of the TECs and therefore, the project is unlikely to impact on these communities.

3.2.2. Threatened Flora and Fauna

EPBC Act

Fauna

The desktop assessment identified seven fauna species listed as threatened under the EPBC Act as potentially occurring within the Project Area (Table 8):

- *Calyptorhynchus banksii graptogyne* (Red-tailed Black-Cockatoo) (Endangered; SA: Endangered);
- *Delma impar* (Striped Legless Lizard) (Vulnerable; SA: Endangered);
- *Grantiella picta* (Painted Honeyeater) (Vulnerable; SA: Rare);
- *Lathamus discolor* (Swift Parrot) (Critically Endangered; SA: Endangered);
- *Litoria raniformis* (Southern Bell Frog) (Vulnerable; SA: Vulnerable);
- *Miniopterus orianae bassanii* (Southern Bent-wing Bat) (Critically Endangered: SA: Endangered);
- *Rostratula australis* (Australian Painted Snipe) (Endangered; SA: Endangered).

The Red-Tailed Black Cockatoo (RTBC) (*Calyptorhynchus banksii graptogyne*) was recorded from the PMST search as "known to breed" in the 5 km search area. The RTBC breeds in eucalypt hollows in south-eastern South Australia and south-western Victoria. Most nests have been found in dead trees, especially Red Gums (*E. camaldulensis*) but also South Australian Blue Gums (*E. leucoxylon*) and Stringybarks (*E. baxteri & E. arenacea*), but RTBC's may still breed in large hollows within live trees. The Red-tailed Black Cockatoo's potential breeding habitat in South Australia includes dead trees with large hollows (>15cm diameter) in the area south of Bordertown and east of Lucindale. Nests typically occur within 5 km of stringybark woodland that is of at least 5 ha in size and has a seed crop (W. Emison, unpublished data). There is one large patch of stringybark vegetation approximately 5 km from the Project Area. Since the Project Area contains large trees with large hollows (dead or alive) it cannot be ruled out that these may be used as breeding habitat. However, given that there are no records of RTBC breeding within trees in the Project Area, the proposed clearance is unlikely to have a significant impact on RTBCs.

The Striped Legless Lizard (*Delma impar*) is known to occur in areas which have, or once had, native grasslands or grassy woodlands (including derived grasslands). The Project Area does not represent a native grassland but may have been. However, there are no records of this species within 5 km of the Project Area since 1995.

The Painted Honeyeater (*Grantiella picta*) is found in dry open forests and woodlands and is strongly associated with mistletoe. It may also be found along rivers, on plains with scattered trees and on farmland with remnant vegetation. This species is typically a vagrant to South Australia, although there is vegetation within the Project Area which may provide perching habitat. Important populations of this species are in New South Wales and select areas of Victoria and Queensland, therefore, the vegetation within the Project Area is unlikely to be considered important habitat for this species.

Swift Parrots (*Lathamus discolor*) are also occasional visitors to South Australia, typically occurring further east. They are found in dry sclerophyll forests and woodlands, suburban parks and gardens and flowering fruit trees. However, as there are no recent records within 5 km of the Project Area since 1995, it is unlikely that the vegetation within the Project Area constitutes important habitat for this species.

The Southern Bent Wing Bat (*Miniopterus orianae bassanii*) is associated with the availability of foraging areas and proximity to suitable roosting caves. Primary habitat is predominantly woodlands near large natural wetlands, river basins and agricultural areas (Churchhill 1998). The Project Area is not located near known roosting caves and therefore, is unlikely to constitute important habitat for this species.

The Australian Painted Snipe (*Rostratula australis*) inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands. No aquatic habitat is present within the Project Area.

Three species listed as Migratory were assessed as "Likely to occur" within 5 km of the Project Area: *Apus pacificus* (Fork-tailed Swift); *Gallinago hardwickii* (Latham's Snipe); and *Myiagra cyanoleuca* (Satin Flycatcher). The Project Area does not represent important habitat for these species, therefore, clearance of trees within the Project Area is unlikely to impact these species.

Flora

The desktop assessment identified five flora species listed as threatened under the EPBC Act as potentially occurring in the Project Area (Table 9).

- *Caladenia formosa* (Elegant Spider-orchid) (Vulnerable; SA: Vulnerable);
- *Caladenia tensa* (Greencomb Spider-orchid) (Endangered; SA: Endangered);
- *Dipodium campanulatum* (Bell-flower Hyacinth Orchid) (Endangered; SA: Vulnerable);
- *Dodonaea procumbens* (Trailing Hop-bush) (Vulnerable; SA: Vulnerable)
- *Senecio psilocarpus* (Swamp Fireweed) (Vulnerable; SA: Vulnerable)

All EPBC Act listed threatened flora species were assessed as unlikely to occur within the Project Area as the understorey is heavily degraded and several species are typically found in healthy woodland systems (*Caladenia formosa*, *Caladenia tensa* and *Dipodium campanulatum*) or does not have suitable habitat within the Project Area (*Dodonaea procumbens* and *Senecio psilocarpus*).

NPW Act

Fauna

An additional five fauna species listed threatened under the NPW Act were assessed as potentially occurring in the Project Area, including three bird species and one mammal species (Table 8):

- *Turnix varius varius* (Painted Buttonquail) (Rare);
- *Myiagra inquieta* (Restless Flycatcher) (Rare);
- *Trichosurus vulpecula* (Common Brushtail Possum) (Rare);
- *Zanda funerea whiteae* (Yellow-tailed Black Cockatoo) (Vulnerable);
- *Burhinus grallarius* (Bush Stone-curlew) (Rare).

Scats from what is thought to be the Common Brushtail Possum (*Trichosurus vulpecula*) were observed during the field survey. The Project Area is likely to provide habitat for this nocturnal species, based recent local records (within 5 km of the Project Area), and the presence of suitable food plants and hollows. If individuals of this species use the trees in the Project Area as foraging habitat, there may be some localised impact on the population, particularly if large hollow-bearing trees are removed or modified. Nocturnal spotlight surveys would verify the presence of this species. It is recommended that large hollow-bearing trees should be avoided where possible to reduce adverse impacts on this species.

The Restless Flycatcher (*Myiagra inquieta*) was observed within the area during the field survey.

Flora

One additional flora species listed as threatened under the NPW Act was assessed as potentially occurring in the Project Area (Table 9):

- *Eucalyptus fasciculosa* (Pink Gum) (Rare).

This species was not observed during the field survey.

A full list of fauna and flora species observed during the field survey is provided in Appendix 2 & 3 and the locations of flora and fauna species identified in the BDBSA 5 km search is provided in Appendix 4.

For more information see the Wimmera Highway Abattoir Flora and Fauna Report (EBS 2020).

Table 8. Likelihood of occurrence of threatened species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Species (common name)	NP&W Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Birds						
Apus pacificus (Fork-tailed Swift)		Mi	5	Likely to occur	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	Unlikely – typically marine, unlikely to use any habitat within the Project Area.
Burhinus grallarius (Bush Stone-curlew)	R		1	2004	The range of this species in south-eastern Australia is now largely confined to grassy woodlands and farmland. While this species occurs in all mainland states, its range has declined drastically in south-eastern Australia.	Unlikely – Project Area does not contain suitable habitat.
Calyptorhynchus banksii graptogyne (South-eastern Red-tailed Black-Cockatoo)	E	EN	3, 5	2003, Known to occur	Inhabit a wide variety of habitats, especially forests and woodlands dominated by eucalypts or casuarinas (BirdLife Australia 2021).	Highly likely – Recent records within the area
Gallinago hardwickii (Latham's Snipe)		Mi	5	Likely to occur	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). Latham's Snipe occurs in temperate and tropical regions of Australia.	Unlikely – no suitable habitat within the Project Area.
Grantiella picta (Painted Honeyeater)	R	VU	5	Likely to occur	Found in dry open forests and woodlands and is strongly associated with mistletoe. It may also be found along rivers, on plains with scattered trees	Possible – suitable habitat, however, no recent records and

					and on farmland with remnant vegetation (BirdLife Australia 2021).	vagrant to South Australia.
Lathamus discolour (Swift Parrot)	E	CE	5	Likely to occur	Found in dry sclerophyll forests and woodlands, suburban parks and gardens and flowering fruit trees. They roost communally, often in the same tree each night. They are almost always in trees, only coming to ground to drink (BirdLife Australia 2021).	Unlikely – No nearby records, although some suitable habitat.
Myiagra cyanoleuca (Satin Flycatcher)		Mi	5	Likely to occur	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe, 2011).	Possible – vagrant species.
Myiagra inquieta (Restless Flycatcher)	R		4	2020	Found in open forests and woodlands and is frequently seen in farmland (BirdLife Australia 2021).	Known – species observed in Project Area during field assessment
Rostratula australis (Australian Painted Snipe)	E	EN	5	Likely to occur	Inhabits many different types of shallow, brackish or freshwater terrestrial wetlands, especially temporary ones which have muddy margins and small, low-lying islands (BirdLife Australia 2021).	Unlikely – unsuitable habitat
Turnix varius varius (Painted Buttonquail)	R		3	2011	Temperate and eastern tropical forests and woodlands form the habitats of this species. They appear to prefer closed canopies with some understory and deep leaf litter on the ground (BirdLife Australia 2021).	Unlikely – no suitable habitat within the Project Area.
Zanda funereal whiteae (Yellow-tailed Black Cockatoo)	V		3	2011	Inhabits a variety of habitat types, but favours eucalypt woodland and pine plantations (BirdLife Australia 2021).	Likely – recent nearby records.
Reptiles						
Delma impar (Striped Legless Lizard)	E	V	5	Likely to occur	Potential habitat for the Striped Legless Lizard includes all areas which have, or once had, native	Possible – No nearby recent records, but

					grasslands or grassy woodlands (including derived grasslands) (DAWE 2021).	suitable habitat exists in Project Area.
Amphibians						
Litoria raniformis (Southern Bell Frog)	V	VU	5	Likely to occur	Found mostly amongst emergent vegetation, including *Typha sp*. (bullrush), *Phragmites sp*. (reeds) and *Eleocharis sp.* (sedges), in or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds and farm dams.	Unlikely – no recent records and no suitable habitat within the Project Area.
Mammals						
Miniopterus orianae bassanii (Southern Bent-wing Bat)	E	CE	5	Likely to occur	Associated with the availability of foraging areas and proximity to suitable roosting caves. Primary habitat is predominantly woodlands near large natural wetlands, river basins and agricultural areas (Churchhill 1998).	Unlikely – Project Area not located near roosting caves. No nearby records.
Trichosurus vulpecula (Common Brushtail Possum)	R		1	2005	Open dry eucalypt forest, woodlands, and suburban areas (AoLA 2021).	Likely – possible scats found during survey. Recent records and suitable habitat exists in Project Area.
Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps, 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others NP&W Act; E= Endangered, V = Vulnerable, R= Rare EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable						

Table 9. Likelihood of occurrence of threatened flora species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Species (common name)	NP&W Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Caladenia formosa (Elegant Spider-orchid)	V	VU	5	Likely to occur	Found in heathy woodlands, woodlands that are well-drained with sandy soils. It grows in flat country with low, shrubby understory (DAWE 2020).	Unlikely – Project Area understorey too degraded.
Caladenia tensa (Greencomb Spider-orchid)	E	EN	5	Likely to occur	Various associations, including Cypress Pine / Yellow Gum Woodland, Pine / Box woodland, mallee-heath sites, healthy woodland and mallee woodland, generally with rock outcrops (DAWE, 2020).	Unlikely – Project Area understorey too degraded.
Dipodium campanulatum (Bell-flower Hyacinth Orchid)	V	EN	3	2009	Occurs in the southeast of SA along the Naracoorte Range. Most known populations in SA have been recorded north of Penola CP. Typically found in Stringybark (*Eucalyptus baxteri/arenacea*) or occasionally SA Blue Gum (*E. leucoxylon*) grassy/heathy woodland over well-drained sandy soils. Associated understorey species include various wattles (*Acacia sp.*), Bracken Fern (*Pteridium esculentum*), Cranberry Heath (*Astroloma humifusum*) and Magenta Storks Bill (*Pelargonium rodneyanum*).	Unlikely – Project Area understorey too degraded.
Dodonaea procumbens (Trailing Hop-bush)	V	VU	5	Likely to occur	This species grows in low-lying, often winter-wet areas in woodland, low open forests, heathland and grasslands, on sands and clays (Duretto 1999).	Unlikely – No suitable habitat within Project Area.
Eucalyptus fasciculosa (Pink Gum)	R		3	2012	Often in poorer sandy soils, in woodland or as an emergent in low shrublands. Commonly associated with *E. baxteri, E. cosmophylla, E. diversifolia, E.*	Likely – nearby recent records.

					leptophylla and *E. leucoxylon* (Nicolle, 2013)	
Senecio psilocarpus (Swamp Fireweed)	V	VU	5	Likely to occur	This species occurs on high-quality herb-rich wetlands on plains. A tree canopy is absent from most sites, or rarely, River Red Gum (*Eucalyptus camaldulensis*) is the overstorey species in a woodland formation. The understorey is rich in grasses and sedges and miscellaneous aquatics. The more easterly populations grow in grey to black silty clay soils whereas the westerly populations grow on peatier soils (Belcher & Albrecht, 1994).	Unlikely – No suitable habitat within Project Area.
Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps, 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others NP&W Act; E= Endangered, V = Vulnerable, R= Rare EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable						

3.3. Cumulative impacts

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.

The direct impact of the Project is the removal of 0.467 ha of native vegetation and 118 scattered trees.

Potential indirect impacts of the Project include:

- Tree root zone impacts;
- Structural root zone impacts;
- Dust generation, which may impact surrounding vegetation; and
- Noise generation, which may impact fauna species in the area.

It is unlikely that the Project will alter the hydrology (e.g. raised or lowered water table, flooding, impounding water or reduced water supply) and impact of the condition or health of the native vegetation being retained in surrounding areas.

3.4. Addressing the Mitigation Hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.

a) Avoidance – outline measures taken to avoid clearance of native vegetation

Avoidance of vegetation for the widening of the road is limited to the safety standards for the upgrade of the intersection. Where possible, the Project has limited the design plans to avoid vegetation. For example, although 14 trees that are important habitat for Red-tailed Black Cockatoos are proposed to be cleared, 20 sensitive trees have been avoided based on early design reviews and engagement between EBS and DIT (see Appendix 1 for sensitive trees within the Project Area).

b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).

The intersection has been designed to impact on the minimum amount of vegetation practical as allowed by safety requirements. Although not in the impact area, due to the presence of Threatened Ecological Communities that may occur within the construction area, measures will also be taken to ensure that no impact during construction will occur by avoiding the TP) and by ensuring the area is protected by fencing during construction where appropriate. Ensure that the design and construction method minimises impacts to all vegetation, avoiding the SRZ as a priority, but also avoiding the TPZ wherever feasible. All vegetation removal and pruning works are to be undertaken by a suitably qualified arboricultural contractor and in accordance with *AS 4373 Pruning of Amenity Trees*.

c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.

The intersection upgrade is permanent land clearance that is unlikely to be rehabilitated or restored.

d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.

The NVC will only consider an offset once avoidance, minimization and restoration have been documented and fulfilled. The SEB Policy explains the biodiversity offsetting principles that must be met.

The adverse impacts to native vegetation that cannot be avoided or minimised will be offset through the achievement of a SEB that outweighs the proposed impact.

3.5. Principles of Clearance (Schedule 1, *Native Vegetation Act 1991*)

The Native Vegetation Council will consider Principles 1(b), 1(c) and 1(d) when assigning a level of Risk under Regulation 16 of the Native Vegetation Regulations. The Native Vegetation Council will consider all the Principles of clearance of the Act as relevant, when considering an application referred under the *Planning, Development and Infrastructure Act 2016*.

Table 10. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
Principle 1(b) – significance as a habitat for wildlife	Relevant information A total of 37 native bird species and 4 introduced bird species were recorded in the Project Area during the fauna assessment. There were seven EPBC listed threatened species identified as potentially occurring within the Project Area as they had recorded observations since 1995 within 5 km of the Project Area: - *Calyptorhynchus banksii graptogyne* (Red-tailed Black-Cockatoo) (Australia (Aus.): Endangered; SA: Endangered); - *Delma impar* (Striped Legless Lizard) ((Aus.: Vulnerable; SA: Endangered); - *Grantiella picta* (Painted Honeyeater) ((Aus.: Vulnerable; SA: Rare); - *Lathamus discolor* (Swift Parrot) ((Aus.: Critically Endangered; SA: Endangered); - *Litoria raniformis* (Southern Bell Frog) ((Aus.: Vulnerable; SA: Vulnerable); - *Miniopterus orianae bassanii* (Southern Bent-wing Bat) ((Aus.: Critically Endangered: SA: Endangered); - *Rostratula australis* (Australian Painted Snipe) (Endangered; SA: Endangered). Of these, one was identified as highly likely to occur within the Project Area, *Calyptorhynchus banksii graptogyne* (Red-tailed Black-Cockatoo). There were four state listed threatened species identified as potentially occurring within the Project Area: - *Turnix varius varius* (Painted Buttonquail) (South Australia (SA): Rare); - *Myiagra inquieta* (Restless Flycatcher) (SA: Rare); - *Trichosurus vulpecula* (Common Brushtail Possum) (SA: Rare); - *Zanda funerea whiteae* (Yellow-tailed Black Cockatoo) (SA: Vulnerable). The Restless Flycatcher was observed within the Project Area during the field survey and scats believed to be from the Common Brushtail Possum were observed within the Project Area. The Yellow-tailed Black Cockatoo was assessed as likely to occur within the Project Area. Patches; Threatened Fauna Score – A1 = 0.1 A2 = 0.1 A3 = 0.1 Unit biodiversity Score –

	A1 = 30.55 A2 = 25.92 A3 = 24.66 Trees; Fauna Habitat Score – 1.8 Biodiversity Score – various across 118 trees (between 0.03 – 5.94)
	Assessment against the principles Seriously at Variance - Patches A1, A2 and A3 and all scattered trees
	Moderating factors that may be considered by the NVC Is the clearance likely to: • Lead to a long-term decrease in the size of a population; • Reduce the area of occupancy of the species; • Fragment an existing population into two or more populations; • Adversely affect habitat critical to the survival of a species; • Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; • Result in invasive species that are harmful to a threatened species becoming established in the threatened species habitat; and • Interfere with the recovery of the species.
Principle 1(c) – plants of a rare, vulnerable or endangered species	Relevant information No threatened plant species were recorded for the site or may have been present but undetectable at the time of assessment, due to the highly degraded nature of the Project Area. Threatened Flora Score(s) – 0 (all trees)
	Assessment against the principles Not at variance
	Moderating factors that may be considered by the NVC N/A
Principle 1(d) – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered	Relevant information No threatened communities under the EPBC Act or threatened ecosystems under the DEW Provisional list of threatened ecosystems are present within the clearance area. Threatened Community Score – 1
	Assessment against the principles Not at variance
	Moderating factors that may be considered by the NVC N/A

Principles of Clearance (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.

3.6. Risk assessment

The level of risk associated with the application

Table 11. Summary of the level of risk associated with the application.

Total clearance	No. of trees	118
	Area (ha)	0.476 ha
	Total biodiversity Score	119.51
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1 (b)
Risk assessment outcome		Level 4 (Escalated from Level 3)

4. Clearance summary

Clearance Area(s) Summary table

Block	Site	Species diversity score	Threatened Ecological community	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1	8	1	0	0.1	30.55	0.3118	9.53	1			10.23	$7,243.62	$398.40
A	2	3	1	0	0.1	25.92	0.01037	0.27	1			0.28	$202.90	$11.16
A	3	3	1	0	0.1	24.66	0.0605	1.49	1			1.57	$1,125.96	$61.93
						Total	**0.476**	**11.29**				**12.08**	**$8,572.48**	**$471.49**

Scattered trees Summary table

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
399	1	1.8	0	0.45	1	0.47	$360.61	
400	1	1.8	0	0.29	1	0.30	$227.76	
401	1	1.8	0	0.44	1	0.46	$353.32	
402	1	1.8	0	0.03	1	0.03	$21.91	
403	1	1.8	0	0.03	1	0.03	$20.44	
404	1	1.8	0	0.22	1	0.23	$173.14	
405	1	1.8	0	0.64	1	0.67	$507.92	
406	1	1.8	0	0.36	1	0.37	$284.12	
407	1	1.8	0	0.64	1	0.67	$509.52	
409	1	1.8	0	0.32	1	0.33	$252.66	
410	1	1.8	0	4.87	1	5.12	$3,890.49	
411	1	1.8	0	0.99	1	1.04	$788.73	
412	1	1.8	0	0.34	1	0.36	$274.72	
413	1	1.8	0	0.06	1	0.06	$46.79	
414	1	1.8	0	1.38	1	1.45	$1,101.43	
415	1	1.8	0	0.55	1	0.58	$440.04	
416	1	1.8	0	0.58	1	0.61	$460.45	
417	1	1.8	0	0.21	1	0.22	$170.81	
418	1	1.8	0	2.04	1	2.14	$1,626.63	
419	1	1.8	0	0.12	1	0.13	$96.77	
420	1	1.8	0	2.10	1	2.20	$1,672.81	
421	1	1.8	0	0.24	1	0.26	$194.92	
422	1	1.8	0	0.42	1	0.44	$336.89	
423	1	1.8	0	1.23	1	1.29	$979.44	
424	1	1.8	0	0.19	1	0.20	$148.34	

425	1	1.8	0	0.06	1	0.06	$48.69	
Tree or Cluster ID	**Number of trees**	**Fauna Habitat score**	**Threatened flora score**	**Biodiversity score**	**Loss factor**	**SEB Points required**	**SEB Payment**	**Admin Fee**
426	1	1.8	0	0.09	1	0.09	$69.05	
427	1	1.8	0	0.08	1	0.09	$66.90	
428	1	1.8	0	0.26	1	0.27	$204.88	
429	1	1.8	0	0.06	1	0.07	$51.20	
430	1	1.8	0	0.27	1	0.29	$217.41	
431	1	1.8	0	0.24	1	0.25	$189.01	
433	1	1.8	0	0.54	1	0.57	$434.04	
434	1	1.8	0	0.63	1	0.67	$506.08	
435	1	1.8	0	0.11	1	0.12	$90.09	
436	1	1.8	0	0.24	1	0.25	$191.37	
437	1	1.8	0	0.47	1	0.50	$377.44	
438	1	1.8	0	0.07	1	0.08	$57.79	
439	41	1.8	0	0.27	1	11.71	$8,903.70	
440	1	1.8	0	3.29	1	3.45	$2,623.37	
441	1	1.8	0	1.99	1	2.09	$1,589.25	
442	1	1.8	0	1.01	1	1.06	$804.68	
443	1	1.8	0	0.50	1	0.52	$396.66	
444	1	1.8	0	1.35	1	1.42	$1,077.33	
445	1	1.8	0	1.13	1	1.19	$903.69	
446	1	1.8	0	1.06	1	1.12	$848.76	
447	1	1.8	0	0.41	1	0.43	$329.29	
448	1	1.8	0	6.43	1	6.75	$5,131.00	
449	1	1.8	0	1.24	1	1.31	$992.58	
450	1	1.8	0	3.81	1	4.00	$3,044.76	
451	1	1.8	0	1.25	1	1.32	$1,000.51	
452	1	1.8	0	1.03	1	1.09	$826.09	
453	1	1.8	0	0.52	1	0.55	$416.36	
454	1	1.8	0	3.33	1	3.50	$2,657.90	
455	1	1.8	0	1.99	1	2.09	$1,589.25	
456	1	1.8	0	2.21	1	2.32	$1,765.28	
457	1	1.8	0	2.49	1	2.61	$1,985.96	
458	1	1.8	0	2.47	1	2.60	$1,973.31	
459	1	1.8	0	3.68	1	3.86	$2,934.67	
460	1	1.8	0	3.32	1	3.49	$2,651.88	
461	1	1.8	0	2.54	1	2.66	$2,024.83	
462	1	1.8	0	1.03	1	1.08	$818.52	
463	1	1.8	0	0.45	1	0.47	$356.51	
465	1	1.8	0	0.32	1	0.33	$252.04	
467	5	1.8	0	1.07	1	5.61	$4,266.13	
469	1	1.8	0	1.29	1	1.35	$1,027.95	
470	1	1.8	0	0.27	1	0.28	$212.08	
471	1	1.8	0	0.22	1	0.23	$176.03	
472	1	1.8	0	3.87	1	4.07	$3,092.89	

473	1	1.8	0	0.44	1	0.47	$355.06	
Tree or Cluster ID	**Number of trees**	**Fauna Habitat score**	**Threatened flora score**	**Biodiversity score**	**Loss factor**	**SEB Points required**	**SEB Payment**	**Admin Fee**
477	1	1.8	0	5.94	1	6.24	$4,746.00	
479	1	1.8	0	4.07	1	4.28	$3,250.67	
480	1	1.8	0	2.43	1	2.55	$1,939.07	
481	1	1.8	0	2.50	1	2.62	$1,992.89	
	118			**108.22**		**113.64**	**$82,287.24**	**$4,525.79**

Totals summary table

	Total Biodiversity score	**Total SEB points required**	**SEB Payment**	**Admin Fee**	**Total Payment**
Application	119.51	125.72	$90,859.72	$4,997.28	$95,857.00

Economies of Scale Factor	0.5
Rainfall (mm)	549

5. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

☐ Establish a new SEB Area on land owned by the proponent.

☐ Use SEB Credit that the proponent has established.

☐ Apply to have SEB Credit assigned from another person or body.

☐ Apply to have an SEB to be delivered by a Third Party.

☒ Pay into the Native Vegetation Fund.

PAYMENT SEB

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

Greenhill proposes to achieve the SEB by paying into Native Vegetation Fund. The total SEB payment required for the clearance of 0.476 ha of native vegetation and 118 scattered trees is $95,857.00 which includes an administration fee of $4,997.28 (including GST).

6. References

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7. Appendices

Appendix 1: Maps of sensitive trees within the Project Area.

Figure 6. Location of impacted and sensitive trees within the Project Area (Map 1 of 5). *Draft Map to be updated.

Figure 7. Location of impacted and sensitive trees within the Project Area (Map 2 of 5). *Draft Map to be updated.

Figure 8. Location of impacted and sensitive trees within the Project Area (Map 3 of 5). *Draft Map to be updated.

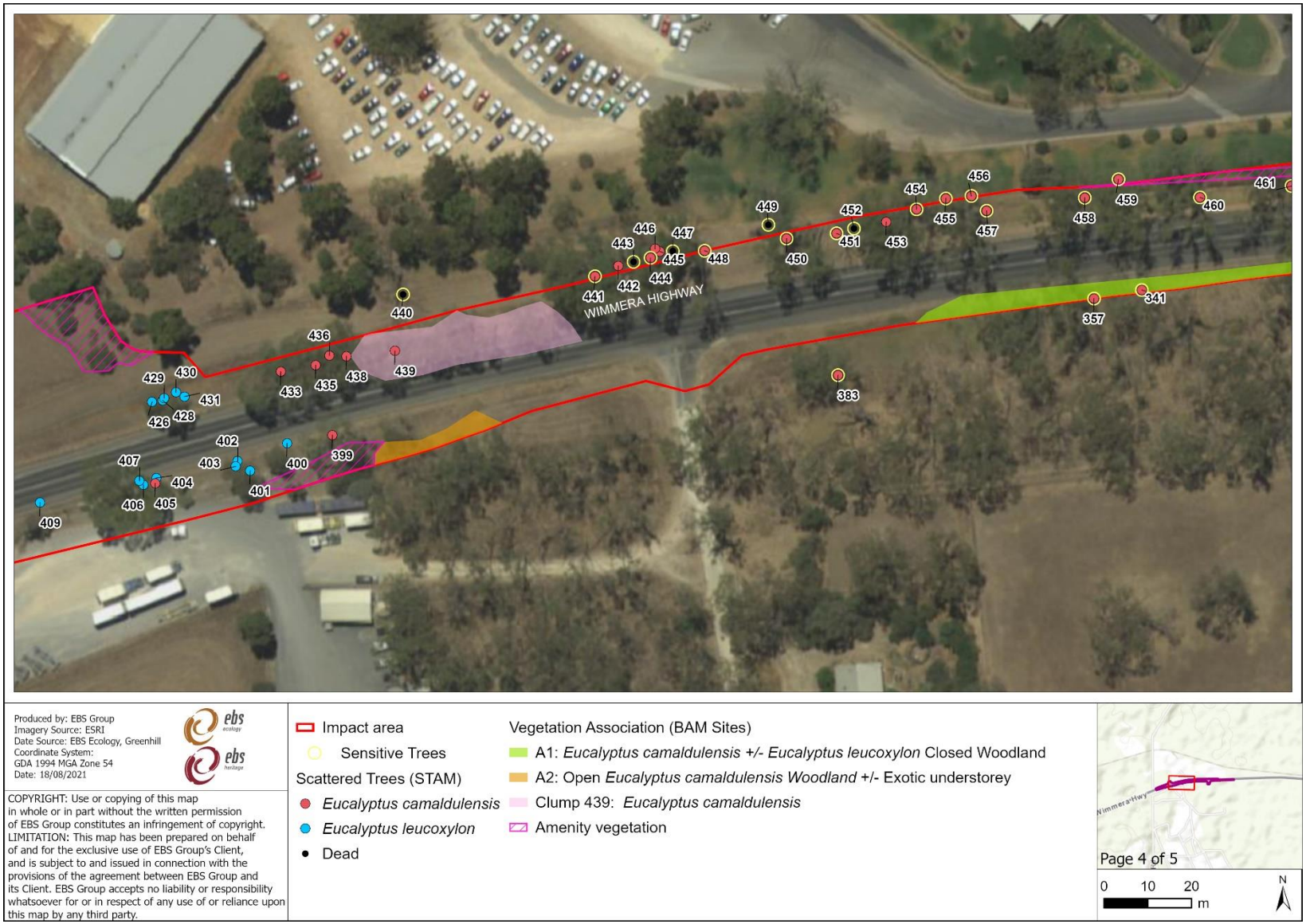


Figure 9. Location of impacted and sensitive trees within the Project Area (Map 4 of 5). *Draft Map to be updated.

Figure 10. Location of impacted and sensitive trees within the Project Area (Map 5 of 5). *Draft Map to be updated.

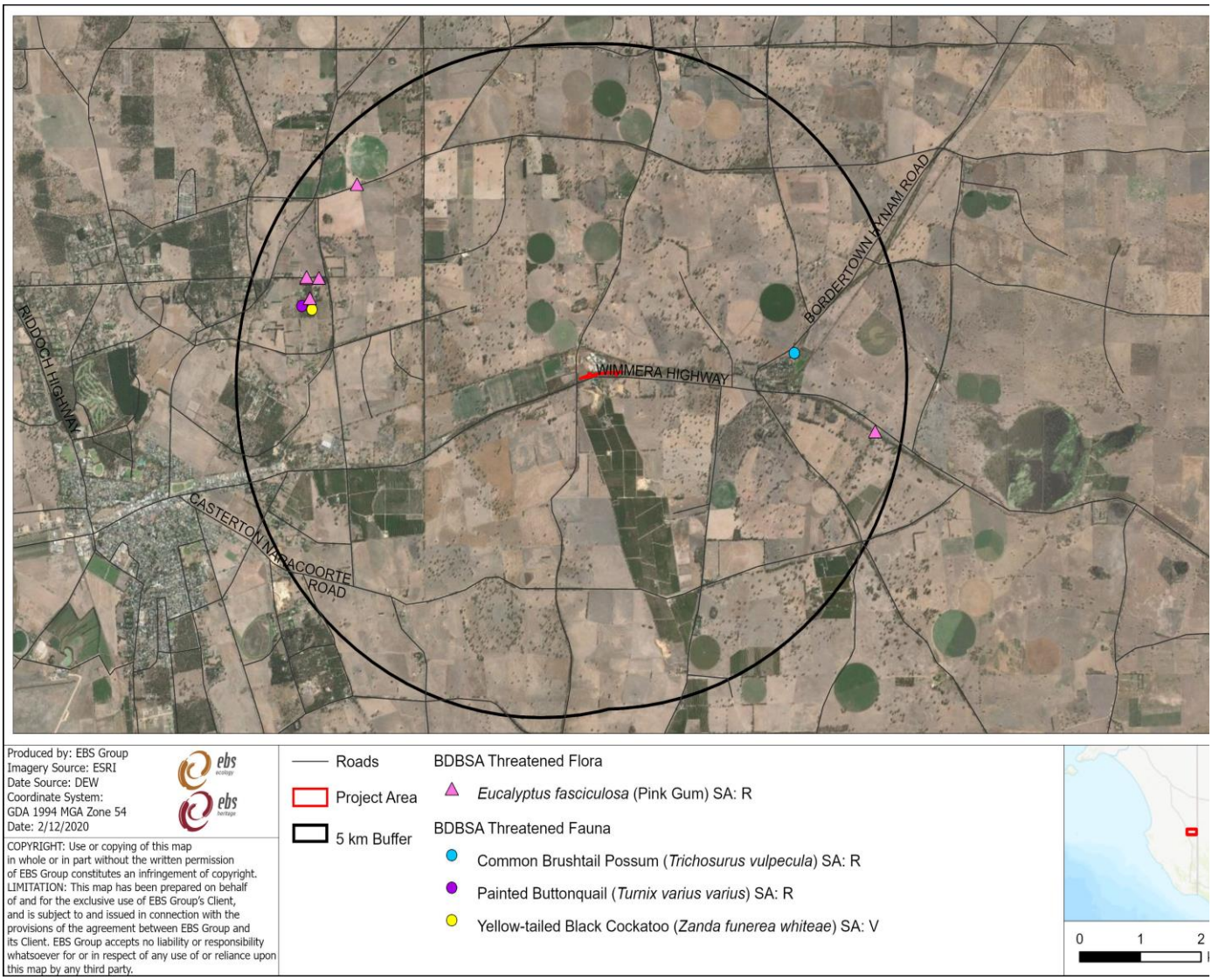
Appendix 2: Fauna species list observed during the field survey.

Species Name	**Common name**	Introduced
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	
Anthochaera carunculata	Red Wattlebird	
Cacatua galerita	Sulphur-crested Cockatoo	
Cacatua sanguinea sanguinea	Little Corella	
Caligavis chrysops	Yellow-faced Honeyeater	
Carduelis carduelis	European Goldfinch	*
Chroicocephalus novaehollandiae	Silver Gull	
Colluricincla harmonica	Grey Shrikethrush	
Corvus tasmanicus	Forest Raven	
Dacelo novaeguineae	Laughing Kookaburra	
Daphoenositta chrysoptera	Varied Sittella	
Dicaeum hirundinaceum	Mistletoebird	
Eolophus roseicapilla	Galah	
Glossopsitta concinna	Musk Lorikeet	
Gymnorhina tibicen	Australian Magpie	
Haliastur sphenurus	Whistling Kite	
Hirundo neoxena	Welcome Swallow	
Malurus cyaneus	Superb Fairywren	
Manorina melanocephala	Noisy Miner	
Melithreptus brevirostris	Brown-headed Honeyeater	
Melithreptus lunatus	White-naped Honeyeater	
Milvus migrans	Black Kite	
Myiagra inquieta	Restless Flycatcher	
Ocyphaps lophotes	Crested Pigeon	
Pachycephala pectoralis	Australian Golden Whistler	
Pardalotus striatus	Striated Pardalote	
Parvipsitta porphyrocephala	Purple-crowned Lorikeet	
Passer domesticus	House Sparrow	*
Petrochelidon nigricans	Tree Martin	
Phylidonyris novaehollandiae	New Holland Honeyeater	
Platycercus elegans	Crimson Rosella	
Psephotus haematonotus	Red-rumped Parrot	
Rhipidura albiscapa	Grey Fantail	
Rhipidura leucophrys	Willie Wagtail	
Smicrornis brevirostris	Weebill	
Sturnus vulgaris	Common Starling	*
Trichoglossus haematodus	Rainbow Lorikeet	
Turdus merula	Common Blackbird	*
Vanellus miles	Masked Lapwing	
Zosterops lateralis	Silvereye	

Appendix 3. Flora Species List observed during the field survey

Species Name	Common name	Introduced
Acacia saligna	Golden Wreath Wattle	*
Acaena novae-zelandiae	Biddy-biddy	
Agapanthus sp.	Agapanthus	*
Amyema miquellii	Box Mistletoe	
Arctotheca calendula	Cape Weed	*
Asparagus asparagoides f.	Bridal Creeper	*
Asphodelus fistulosus	Onion Weed	*
Austrostipa sp.	Spear Grass	
Avena barbata	Bearded Oat	*
Bromus diandrus	Great Brome	*
Cenchrus clandestinus	Kikuyu	*
Cynoglossum australe	Australian Hound's-tongue	
Dactylis glomerata	Cocksfoot	*
Ehrharta calycina	Perennial Veldt Grass	*
Elymus repens	Couch	*
Eucalyptus camaldulensis	River Red Gum	
Eucalyptus leucoxylon	SA Blue Gum	
Euphorbia terracina	False Caper	*
Fumaria capreolata	White-flower Fumitory	*
Gallium sp.	Bedstraw	*
Geranium sp.	Native Geranium	
Juncus sp.	Native Rush	
Lactuca serriola f.	Prickly Lettuce	*
Lysimachia arvensis	Pimpernel	*
Malva parviflora	Small-flower Marshmallow	*
Marrubium vulgare	Horehound	*
Medicago sp.	Medic	*
Melicytus angustifolius ssp. divaricatus	Tree Violet	
Moraea sp.	Thread Iris	*
Olea europaea	Olive	*
Osteospermum fruticosum	Shrubby Daisybush	*
Oxalis pes-caprae	Soursob	*
Panicum sp.	Panic Grass	*
Phalaris aquatica	Phalaris	*
Piptatherum miliaceum	Rice Millet	*
Plantago lanceolata	Ribwort	*
Rumex sp.	Dock	*
Rytidosperma sp.	Wallaby Grass	
Scabiosa atropurpurea	Pincusion	*
Sonchus oleraceus	Common Sow-thistle	*
Sparaxis sp.	Sparaxis	*
Taraxacum sp.	Dandelion	*
Urtica sp.	Nettle	*
Vicia sativa	Common Vetch	*
Vulpia sp.	Fescue	*

Appendix 4: BDBSA search results of threatened flora and fauna species within 5 km of the Project Area.



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