Native Vegetation Clearance

Long Valley Road Overtaking Lane

Data Report

Clearance under the *Native Vegetation Regulations 2017*

24 October 2022

Prepared by H. Merigot – EBS Ecology (NVC Accredited Consultant)

Native Vegetation Clearance Long Valley Road Overtaking Lane Data Report

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Cover photograph: Remnant *Eucalyptus camaldulensis* within the Project Area.

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Glossary and abbreviations

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*
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	Long Valley Road Overtaking lanes
Project Area	MM 17 and MM 19.5 from just south of Gemmells Road to south of Mine Flat Road, Strathalbyn
SA	South Australia(n)
Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches
SEB	Significant Environmental Benefit
sp.	Species
spp.	Species (plural)
ssp.	Sub-species
STAM	Scattered Tree Assessment Method
TEC	Threatened Ecological Community
var.	Variety (a taxonomic rank below that of species and subspecies, but above that of form)

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Application information

Table 1. Application details.

Applicant:	Department for Infrastructure and Transport (DIT)		
Key contact:			
Landowner:	DIT		
Site Address:	Long Valley Road, between MM 17 to MM 19.5, Strathalbyn.		
Local Government Area:	Alexandrina	**Hundred:**	Strathalbyn
Title ID:	N/A Road reserve	**Parcel ID**	N/A Road reserve

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance required for the addition of an overtaking lane on Long Valley Road.
Native Vegetation Regulation:	Regulation 12(32) — Works on behalf of Commissioner of Highways.
Description of the vegetation under application:	42 remnant scattered trees, which consists of 28 *Eucalyptus camaldulensis*, 8 *Eucalyptus leucoxylon ssp. leucoxylon, 3 Eucalyptus viminalis ssp. cygnetensis*, 1 *Eucalyptus fasciculosa* and 2 *Acacia paradoxa*.
Total proposed clearance – area (ha) and/or number of trees:	42 Scattered trees are proposed to be cleared.
Level of clearance:	Level 4
Overlay (Planning and Design Code):	Native Vegetation Overlay

Map of proposed clearance area:	
Mitigation Hierarchy:	***Avoidance*** **-** An options assessment was undertaken to select a preferred overtaking lane location within the nominated study area from a shortlist of 4 options. Vegetation was a key value criteria within this assessment, which was balanced against other operational and safety considerations. In general, the road corridor along Long Valley Road is characterised by densely vegetated verges. Other options considered would have comparable impacts in terms of the extent or type of clearing required. Therefore, it is unlikely that clearance associated with the proposed intersection upgrades can be avoided or located elsewhere. ***Minimization*** **-** Following selection of the preferred location, the design has been developed with a view to minimise the earthworks footprint by steepening batters and adopting design minima. The design has also aimed to contain road widening to the western side of the road, preserving vegetation on the eastern side. Moreover, pavements adjacent to the preserved eastern side are to be predominantly resealed/overlayed to negate the need for pavement boxout and impact on tree roots. During construction of the new drain line and culvert, trees 34 and 42 to 48 will be retained where possible by pruning instead of total clearance. ***Rehabilitation or restoration –*** No onsite rehabilitation will occur with this clearance as roadsides are not secure locations for replanting due to the potential for future construction and maintenance activities. To ensure the

	surrounding vegetation quality is maintained, it is recommended that Declared and Environmental weed species (e.g. Olive) are controlled. ***Offset –*** Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised should be offset by implementing an SEB that outweighs that impact. Biodiversity offsets address any residual impacts after prevention and mitigation measures have been implemented.
SEB Offset proposal	The SEB payment is **$98,531.07** which includes an administration fee of $5,136.69 including GST.

1. Purpose of clearance

1.1. Description

EBS Ecology were engaged by GHD Pty Ltd (GHD) on behalf of the Department for Infrastructure and Transport (DIT) to undertake a native vegetation clearance assessment for the provision of an overtaking lane between Gemmells and Strathalbyn on Long Valley Road (the Project). Clearance is required for approximately 2.5 km of roadside approximately between Maintenance Marker (MM) 17.5 and MM 19 to improve safety along the roadside.

Long Valley Road is an important road that connects Strathalbyn to Mount Barker and the South Eastern Freeway to Adelaide. The existing road is winding and undulating and has limited opportunities for safe overtaking along the 13 km between Wistow and Strathalbyn.

Accordingly, the Department for Infrastructure and Transport has identified the need for a new southbound overtaking lane within this section. The new overtaking lane will provide safe and convenient overtaking opportunities and reduce the potential for head-on collisions due to driver frustration. The works will include additional separation between the northbound and southbound carriageways in the vicinity of the new overtaking lane to reduce the potential for head-on collisions with errant vehicles, audio tactile line marking and a central wire rope safety barrier. It will also include improved protection from roadside hazards.

Objectives

The objectives of the report are to:

- 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);
- Undertake a survey of the vegetation and identify and include vegetation that will require removal and/or major prune approval as a result of the works; and
- Prepare a Vegetation Survey Report, including recommendations to avoid and/or minimise impacts to vegetation, calculation of the required SEB offset and preparation of the appropriate Vegetation Removal Approval Documents to accompany the impacts identified in the vegetation survey.

This report presents findings of the desktop assessment; in addition to results of the Scattered Tree Assessment Method (STAM) required for assessing trees proposed for clearance under the *Native Vegetation Regulations*.

1.2. Background

The Long Valley Rd Project Area is located in South Australia approximately 6 kilometres (km) to the north of Strathalbyn. The Project Area includes both sides of the road (Figure 1).

The current and surrounding land use is primarily agricultural and livestock production. Some rural residential areas are also present on Long Valley Road. The nearest conservation area is Monarto Conservation Park which is 18 km to the East. The closest Heritage Area is HA 1312, which lies approximately 3 km to the east of the Project Area.

The Project will occur approximately between Maintenance Marker (MM) 17 and MM 19.5 from approximately Gemmells Road intersection to just south of Mine Flat Road, Strathalbyn. This will require the clearance or impact to **42 native scattered trees**.

Administrative Boundaries

The Project Area occurs within Hills and Fleurieu Landscape Management Region and the Alexandrina Local Government Area.

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 Kanmantoo IBRA Bioregion, Fleurieu IBRA Subregion and Scotts Hill IBRA Environmental Association.

Approximately 12% (45,372 ha) of the Fleurieu IBRA Subregion and approximately 10% (9673 ha) of the Scotts Hill IBRA Environmental Association is mapped as remnant vegetation. Of this, 24% (10,865 ha) and 5% (464 ha) is formerly conserved and protected, respectively.

1.3. General location map

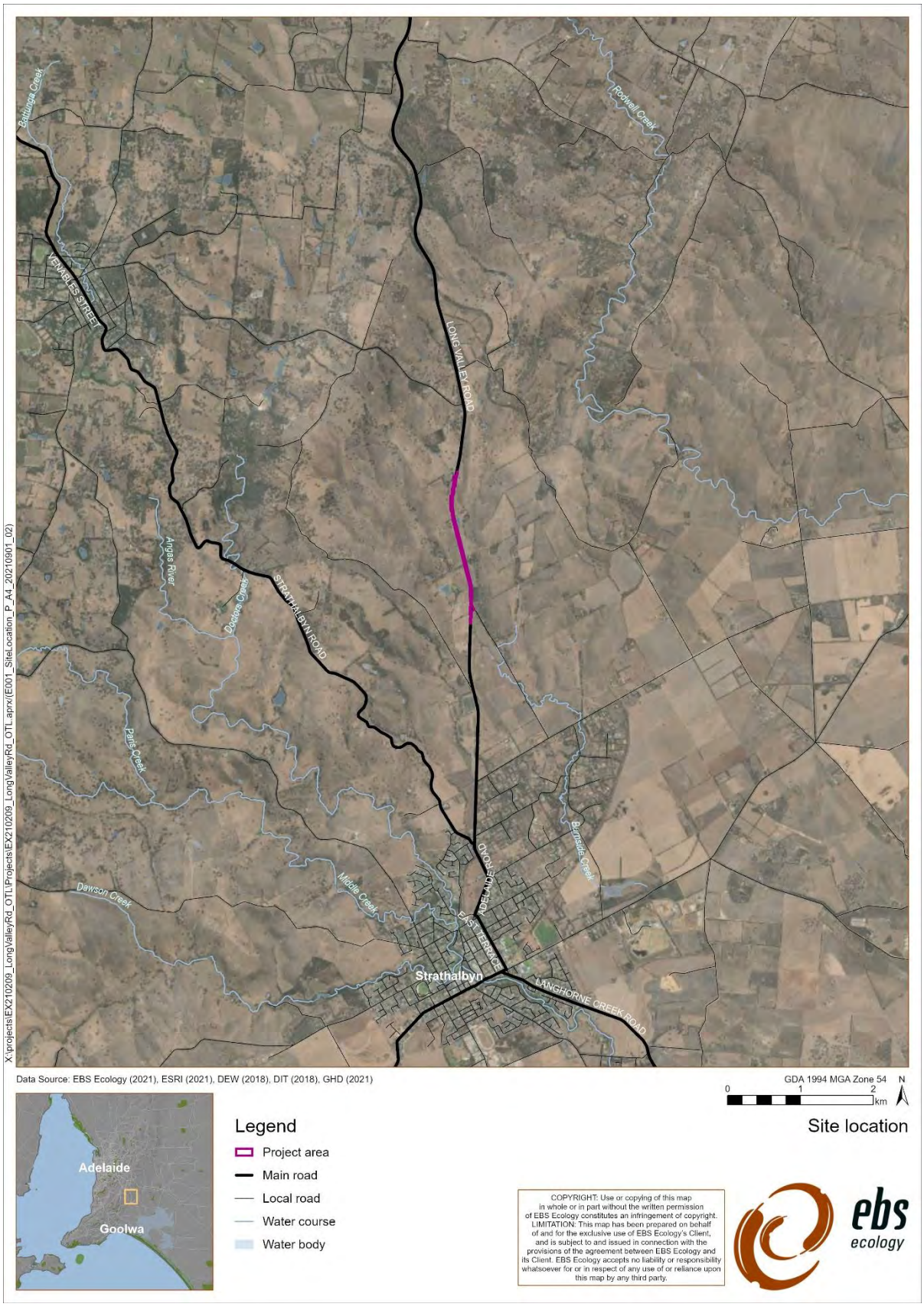

Figure 1. Location of the Project Area.

1.4. Details of the proposal

The proposed clearance area for the overtaking lane includes the removal 42 scattered trees along Long Valley Road.

1.5. Approvals required *or* obtained

Native Vegetation Act 1991 – no previous approvals associated with this Project.

National Parks and Wildlife Act 1972 - EBS has the required flora collection permit.

Environment Protection and Biodiversity Conservation Act 1999 - EPBC approval is not required for this Project.

Landscape South Australia Act 2019 - A Permit to transport declared weeds on a public road or may be required for this Project. A Water Affecting Activity Permit may be required for this Project.

Aboriginal Heritage Act 1988 – Approval will be required if any sites, objects or remains are uncovered during the works.

Water Resources Act 1997 – a water licence may be required for this Project.

1.6. Native Vegetation Regulation

An assessment against the Principles of Clearance under the *Native Vegetation Act 1991* is considered to not be required as the clearance associated with the Project is in accordance with Division 5 of the *Native Vegetation Regulations 2017*, which allows for the clearance of native vegetation in relation to specific activities as set out in Schedule 1, Parts 4, 5 or 6 of the Regulations. 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 30/06/2021 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 7/07/2021, 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 provide 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 Consultant H. Merigot and P. Drummond on 1/6/2021 in accordance with the Scattered Tree Assessment Method (STAM) (NVC 2020c).

2.2.1. 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 and the lists of scattered tree 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

All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests and other signs of presence) during the native vegetation clearance 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

The vegetation within the Project Area was mapped as a result of the field survey at the site (Figure 2 - Figure 5). The Project Area occurs predominantly within the road corridor and on private property particularly on the eastern side of the road. The Project Area intersects with some creeks, including diverting the along a man-made drainage line parallel to the road. A number of culverts also allow minor drainage under the road carriageway in places. None of these drainage lines have permanent water or aquatic vegetation associated with them.

Vegetation is typical of disturbed road verges throughout the region, with an overstorey of smooth-barked *Eucalyptus* sp. over exotic grasses. Where private residences occur close to the road corridor, amenity plantings and gardens of introduced ornamental species also occurs.

Long Valley Road traverses country largely cleared of vegetation, with remnant patches largely confined to road and rail corridors. Although it lacks essential habitat elements for many fauna species, such as large hollows, complex litter layer and fallen logs, it is likely to provide shelter and foraging habitat for common fauna species and may occasionally provide some foraging resources for some threatened species. Forty-four (44) plant species were recorded during the survey, including twenty-six (26) introduced species (Appendix 1).

One threated plant species, *Eucalyptus fasciculosa* (Pink Gum) was recorded within the Project Area, but is not being removed. No other threatened flora or threatened fauna species were recorded during the field survey.

3.1.2. Details of the scattered trees proposed to be impacted

Forty-two (42) scattered trees, consisting of three different native species were assessed using STAM (Table 4 , Attachment 1). *Eucalyptus camaldulensis ssp. camaldulensis* (Red Gum) was the most abundant tree species, followed by *Eucalyptus leucoxylon* (South Australian Blue gum), and *Eucalyptus viminalis ssp. cygnetensis* (Rough manna Gum). Photos of the trees to be impacted are provided in Appendix 2 and locations are provided in Figure 2, Figure 3, Figure 4 and Figure 5.

Native vegetation likely to be impacted in the Project Area was largely limited to scattered trees over exotic grasses and forbs. The remaining vegetation was planted amenity vegetation or weed patches.

Table 4. Details of the scattered trees proposed to be impacted.

Tree #	Tree spp.	No. of trees	Height (m)	Hollows	Diameter (cm)	Canopy dieback (%)	Biodiversity Score
11	*Eucalyptus camaldulensis var camaldulensis*	1	15		74	0	3.32
12	*E. camaldulensis var camaldulensis*	1	14	1 small	190	0	7.17
49	*E. camaldulensis var camaldulensis*	1	8.5	1 small	32.5	0	0.58
50	*E. camaldulensis var camaldulensis*	1	12	1 small	148	0	4.72
51	*E. camaldulensis var camaldulensis*	1	6.5	1 small	25	0	0.43
52	*E. camaldulensis var camaldulensis*	1	12	1 small	65	0	2.14
20	*E. camaldulensis var camaldulensis*	1	14	4 small	153	0	6.23
21	*E. camaldulensis var camaldulensis*	1	13	4 small	147	1	4.85
23a	*E. camaldulensis var camaldulensis*	1	16		78	0	3.59
23b	*E. camaldulensis var camaldulensis*	1	10		10	0	0.36
24a	*E. camaldulensis var camaldulensis*	1	13		93	0	3.42
24b	*E. camaldulensis var camaldulensis*	1	13		85	0	3.30
26	*E. camaldulensis var camaldulensis*	1	16		180*	0	6.62
27	*E. camaldulensis var camaldulensis*	1	16	3 small	178	10	6.95
29a	*Eucalyptus viminalis ssp. cygnetensis*	1	14	2 small	122	110	6.08
29b	*E. viminalis ssp. cygnetensis*	1	14	2 small	116	10	5.93
29c	*E. viminalis ssp. cygnetensis*	1	14	2 small	148	15	6.72
30	*E. camaldulensis var camaldulensis*	1	17	4 small	320*	5	12.01
31	*E. camaldulensis var camaldulensis*	1	17		80*	5	3.69
32	*E. camaldulensis var camaldulensis*	1	16	2 small	186	5	7.37
33a	*E. camaldulensis var camaldulensis*	1	16		100	0	3.99
33b	*E. camaldulensis var camaldulensis*	1	12		34	0	1.09
33c	*E. camaldulensis var camaldulensis*	1	12		31	0	1.02
34a	*E. camaldulensis var camaldulensis*	1	9		61	5	1.29
34b	*E. camaldulensis var camaldulensis*	1	6		40	5	0.58
35	*E. camaldulensis var camaldulensis*	1	13		60#	5	2.06
36a	*E. leucoxylon ssp leucoxylon*	1	14		60#	0	2.39
36b	*E. leucoxylon ssp leucoxylon*	1	14		60#	0	2.39
37	*E. camaldulensis var camaldulensis*	1	12		132	50	2.21
38	*Eucalyptus fasciculosa*	1	10		54	0	4.47
39	*Acacia pycnantha*	1	2.5		18	0	0.44
39	*A. pycnantha*	1	2.5		18	0	0.44
40	*E. camaldulensis*	1	4.5		12	0	0.26
41	*E. camaldulensis var camaldulensis*	1	4		12	0	0.25
42	*E. camaldulensis var camaldulensis*	1	11		48	0	1.29
43	*E. leucoxylon ssp leucoxylon*	1	9.5		39	0	1.13
44	*E. leucoxylon ssp leucoxylon*	1	10		31	5	0.62
45	*E. leucoxylon ssp leucoxylon*	1	12		89	0	3.41
46	*E. leucoxylon ssp leucoxylon*	1	13		55	0	2.17
47	*E. leucoxylon ssp leucoxylon*	1	7		29	5	0.45
48	*E. leucoxylon ssp leucoxylon*	1	6		13	0	0.31
53	*E. camaldulensis var camaldulensis*	1	3		8	0	0.20

***Note: Trees with "*" next to diameter have been estimated as the tree was unable to be accessed due to safety concerns. Trees with "#" are estimates as they were on private property and unable to be measured. Photos of the trees are provided in Appendix 2.**

Trees labelled 'a', 'b', 'c' are denoted by one GPS point. See design plans (Attachment 2) for exact locations of these trees.

3.1.3. Site map showing areas of proposed impact

Figure 2. Scattered Trees located within the Project Area (map 1 of 4).

Figure 3. Scattered Trees located within the Project Area (map 2 of 4).

Figure 4. Scattered Trees located within the Project Area (map 3 of 4).

Figure 5. Scattered Trees located within the Project Area (map 4 of 4).

3.2. Threatened species assessment

3.2.1. Matters of National Environmental Significance (MNES)

The PMST indicated that two Threatened Ecological Communities (TECs) and one Wetland of International Significance may occur in the Project Area. The field survey determined that none of these communities are present in the Project Area (Table 5).

- The Coorong and Lakes Alexandrina and Albert Wetland (EPBC Act, Ramsar Convention);
- Peppermint Box (*Eucalyptus odorata*) Grassy Woodland (PBGW) of South Australia (Critically Endangered);
- Iron-grass Natural Temperate Grassland of South Australia (Critically Endangered).

The vegetation recorded in the Project Area do not match any communities listed as threatened on the *Provisional List of Threatened Ecosystems of South Australia* (Department for Environment and Heritage, In progress).

Table 5. MNES identified by the desktop assessment.

Matters of National Environmental Significance	EPBC Act	Data source	Comments
Iron-grass Natural Temperate Grassland of South Australia	CR	1	The field survey did not record any Iron-grass grassland in the Project Area.
Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia	CR	1	The field survey did not record any scattered *Eucalyptus odorata* or *Eucalyptus odorata* woodland vegetation associations in the Project Area.
The Coorong and Lakes Alexandrina and Albert Wetland		1	The Project Area is approximately 10 km upstream of this wetland and is outside of the Ramsar wetland boundary.

Source: 1= PMST
EPBC Act: CR = Critically Endangered

3.2.2. Threatened flora

Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) Listed

The PMST identified 7 plant species listed as threatened under the EPBC Act as potentially occurring within the Project Area. Of those, one was assessed as possibly occurring within the Project Area due to the presence of suitable habitat (Table 6):

- *Acacia rhetinocarpa* (Neat Wattle) (Vulnerable);
- *Caladenia colorata* (Coloured Spider-orchid) (Endangered);
- *Caladenia rigida* (Stiff White Spider-orchid) (Endangered);
- *Caladenia tensa* (Greencomb Spider-orchid) (Endangered);
- *Glycine latrobeana* (Clover Glycine) (Vulnerable);
- *Olearia pannosa ssp. pannosa* (Silver Daisy-bush) (Vulnerable);
- *Prasophyllum pallidum* (Pale Leek-orchid) (Vulnerable).

Of these, none were listed by the PMST report as "known to occur" within the Project Area. Three species (*Caladenia colorata*, *Prasophyllum pallidum* and *Olearia pannosa ssp. pannosa*) were identified as possibly occurring within the Project area, however, there are no recent nearby records for these species and the understorey within the Project Area is highly degraded with dense weed matting particularly on the western side. Therefore, it is unlikely that these species would be present within the Project Area. All other species were assessed as unlikely to occur within the Project Area due to the absence of suitable habitat.

National Parks and Wildlife Act 1972 (NPW Act) Listed

The NatureMaps desktop assessment identified seven species listed as threatened under the NPW Act as potentially occurring in the Project Area (Table 6):

- *Austrostipa densiflora* (Fox-tail Spear-grass) (Rare);
- *Bothriochloa macra* (Red-leg Grass) (Rare);
- *Cladium procerum* (Leafy Twig-rush) (Rare);
- *Eucalyptus fasciculosa* (Pink Gum) (Rare);
- *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) (Rare);
- *Mentha satureioides* (Native Pennyroyal) (Rare);
- *Rytidosperma laeve* (Smooth Wallaby-grass) (Rare).

The State listed species *Eucalyptus fasciculosa* (Pink Gum) was recorded in the Project Area, but is being retained. Considering the habitat preferences of the species identified and the nature of habitat present in the Project Area, four of the above threatened flora species have been assessed as possibly occurring in the Project Area: *Cladium procerum* (Leafy Twig-rush); *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum); *Mentha satureioides* (Native Pennyroyal); and

Rytidosperma laeve (Smooth Wallaby-grass). However, none of these species were observed during the field survey. The remaining three species were assessed as unlikely to occur within the Project Area due to the absence of suitable habitat.

Table 6. 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)	Conservation Rating		Data source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat – Comments
	NPW Act	EPBC Act				
Acacia rhetinocarpa (Neat Wattle)		VU	1	Likely to occur	Known to occur on dune crests and dunes/hills, plains and swales. It is also known to survive in degraded sites largely devoid of remnant vegetation and often confined to roadsides and rail reserves. Normally associated with low mallee of *Eucalyptus dumosa* (White Mallee), *E. foecunda* (Hooked Mallee), *E. calycogona* (Square-fruited Mallee), *E. incrassata* (Ridge-fruited Mallee) and *E. brachycalyx* (Gilja) mallee associations.	**Unlikely.** No dunes, swales or hills located. No suitable *Eucalyptus sp.* that the acacia is associated with within the Project Area.
Austrostipa densiflora (Fox-tail Spear-grass)	R		2	2010	Most common in elevated, drier sites*, A. densiflora* occurs almost exclusively amongst rocks or very shallow soil overlying rock.	**Unlikely.** Although recorded within 20 years, there is no suitable habitat in the Project Area where rocky habitats occur.
Bothriochloa macra (Red-leg Grass)	R		2	2004	Woodlands and grasslands of the eastern and western foothills. In South Australia, a grassland specialist of grassy ecosystems, not usually found in high rainfall forests.	**Unlikely.** Although recorded within since 1995, there is no suitable habitat in the Project Area. The Project Area falls within the high rainfall part of the Mt Lofty Ranges, does not consist of grassy ecosystems and vegetation communities are dominated by weeds in the understorey.
Caladenia colorata (Coloured Spider-orchid)		EN	1	Likely to occur	In South Australia the Coloured Spider-orchid grows in sandy, fertile soils but also in rock outcrops and in mallee/Broombush association. This species grows in woodland dominated by *Eucalyptus leucoxylon* (Blue Gum), *E. fasciculosa* (Pink Gum), *E. porosa* (Black Mallee Box), *Allocasuarina verticillata* (Drooping Sheoak) and *Callitris gracilis* (Southern Cypress Pine).	**Possible.** Some suitable vegetation present, however no nearby records or sandy soils and outcrops.
Caladenia rigida		EN	1	Likely to occur	*Eucalyptus obliqua, E. fasciculosa, E. leucoxylon, E. goniocalyx, E. microcarpa* open forests with a relatively open shrub layer.	**Unlikely.**

Species (common name)	Conservation Rating		Data source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat – Comments
	NPW Act	EPBC Act				
(Stiff White Spider-orchid)						No nearby records and understorey vegetation throughout the Project Area is dense and weedy, without the openness required by this species. Habitat is unsuitable.
Caladenia tensa (Greencomb Spider-orchid)		EN	1	Likely to occur	Various habitats have been described including Cypress Pine / Blue gum Woodland, Pine / Box woodland, mallee-heath sites, healthy woodland and mallee woodland, generally with rock outcrops. Flowering in spring (September - October).	**Unlikely.** Blue gum present, however understorey is highly disturbed and there are no nearby records.
Cladium procerum (Leafy Twig-rush)	R		2	2003	Grows in coastal swamps and the margins of deep-water creeks.	**Possible.** There is a creek adjacent to the Project Area, although it is intermittently inundated.
Eucalyptus fasciculosa (Pink Gum)	R		2	2003	Sandy and rocky areas in soils of low fertility. In the Mount Lofty Ranges, it is often associated with *E. leucoxylon* and *E. odorata*	**Known.** An individual was recorded in the Project Area.
Eucalyptus viminalis ssp. *viminalis* (Manna Gum)	R		2	2003	Higher parts of the Mount Lofty Ranges on moist slopes.	**Possibly.** Although it would occur nearby, Manna Gum was not recorded in the area to be impacted in the Project Area, despite surveying all scattered trees to be impacted.
Glycine latrobeana (Clover Glycine)		VU	1	Likely to occur	Generally found in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer growing on undulating plains, gentle south-west facing ridge slopes and lower south facing river valley slopes. In the SE it has been collected beneath Bracken in scrub and from woodland of *Eucalyptus baxteri*, whilst in the MLR it is found in *E. viminalis* woodland and open woodland sometimes with *E. leucoxylon*.	**Unlikely.** Habitat may be suitable, although degraded and the species was not identified during the field survey.

Species (common name)	Conservation Rating		Data source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat – Comments
	NPW Act	EPBC Act				
Olearia pannosa ssp. pannosa (Silver Daisy-bush)		VU	1	Likely to occur	Is generally found in sandy, flat areas and in hilly, rocky areas in woodland or mallee communities dominated by a wide range of eucalypt, Melaleuca and Callitris species.	**Possible.** Habitat may be suitable, although degraded and the species was not identified during the field survey.
Mentha satureioides (Native Pennyroyal)	R		2	2001	Moist areas subject to periodic flooding. Usually on clay soils.	**Possible.** Possible suitable habitat within the Project Area although not observed during survey.
Prasophyllum pallidum (Pale Leek-orchid)		VU	1	Likely to occur	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest from the Flinders Ranges to the Northern and Southern Lofty regions of SA. Recorded in woodlands and forests dominated by *Eucalyptus leucoxylon*, *E. goniocalyx, E. fasciculosa, E. microcarpa, Callitris gracilis/Eucalyptus fasciculosa, and Allocasuarina verticillata* over *Lissanthe strigosa, Amphipogon strictus and Tricoryne elatior*.	**Possible.** Suitable habitat within Project Area, however no recent nearby records.
Rytidosperma laeve (Smooth Wallaby-grass)	R		2	1998	Seasonally damp habitats in open grassland or very open grassy woodland.	**Possible.** There is damp areas within the Project Area, however the understorey is heavily degraded and contained minimal native vegetation.

Source: 1= PMST, 2 = NatureMaps.
NPW Act: E= Endangered, V = Vulnerable, R= Rare.
EPBC Act: Ex = Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory.

3.2.3. Threatened fauna

EPBC Act listed

The desktop assessment identified nine species listed as threatened or migratory as potentially occurring within the Project Area. Two of these species, Painted Honeyeater (*Grantiella picta*) and White-throated Needletail (*Hirundapus caudacutus*) are vagrants to the area and the vegetation within the Project Area is unlikely to be considered important habitat for these species. Two additional nationally Vulnerable species were assessed as possibly occurring within the Project Area:

- *Pteropus poliocephalus* (Grey-headed Flying-fox); and
- *Litoria raniformis* (Growling Grass Frog).

Grey-headed Flying-Foxes (GHFF) have one camp within South Australia in the Adelaide Parklands approximately 42 km from the Project Area. Vegetation beyond camps are likely to be used for roosting only and the probability of GHFF's using scattered trees decreases with increasing distance from camp. As a result, the vegetation within the Project Area is unlikely to impact on GHFF's.

The Growling Grass Frog (GGF) is 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. A small creek occurs adjacent to the Project Area and runs under the road through a culvert into a man-made open drain which runs parallel to the road for approximately 500 m of the Project Area. The adjacent creek may provide suitable habitat for this species, however, there are no recent nearby records of this species, the nearby creek is unlikely to be considered important habitat for this species and the proposed works will not impact on this creek. No EPBC significant impact assessment is required for the Growling Grass Frog.

The remaining species were assessed as unlikely to occur due to the presence of unsuitable habitat.

NPW Act listed

Ten species listed as threatened under the NPW Act as potentially occurring in the Project Area, including two reptiles, seven birds and one mammal (Table 7):

- *Corcorax melanorhamphos* (White-winged Chough);
- *Falcunculus frontatus* ssp. *frontatus* (Crested Shrike-tit);
- *Grantiella picta* (Painted Honeyeater);
- *Oxyura australis* (Blue-billed Duck);
- *Spatula rhynchotis* (Australasian Shoveler);
- *Melithreptus gularis* (Black-chinned Honeyeater);
- *Neophema elegans elegans* (Elegant Parrot);
- *Trichosurus vulpecula* (Common Brushtail Possum);
- *Morelia spilota* (Carpet Python);
- *Eulamprus heatwolei* (Yellow-bellied Water Skink).

Of these, six were assessed as potentially occurring within the Project Area: *Corcorax melanorhamphos* (White-winged Chough), *Morelia spilota* (Carpet Python), *Falcunculus frontatus* ssp. *frontatus* (Eastern Shrike-tit), *Melithreptus gularis* (Black-chinned Honeyeater), *Neophema elegans elegans* (Elegant Parrot) and *Trichosurus vulpecula* (Common Brushtail Possum) due to suitability of habitat. In particularly, Common Brushtail Possum was assessed as likely to occur within the Project Area due to the presence of hollows.

No threatened species were observed during the field survey (see Appendix 3). The likelihood of occurrence assessment for each fauna species identified in the desktop search is provided in Table 7 and the locations of threatened species as determined by the BDBSA search is provided in Appendix 4.

Table 7. Likelihood of occurrence of threatened fauna species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
REPTILES						
Morelia spilota (Carpet Python)	R		2	2015	In South Australia, dry sclerophyll forest, preferring areas with ground cover and fallen logs. Lives in hollows of large *Eucalyptus camaldulensis* and other *Eucalyptus* sp.	**Possible.** Habitat suitable - understorey is disturbed, but Project Area contains *Eucalyptus camaldulensis* with a few fallen logs, however only trunk sized.
Eulamprus heatwolei (Yellow-bellied Water Skink	V		2	2010	Post-1983 AMLR filtered records are limited and restricted to the southern Fleurieu, between Strathalbyn and Deep Creek. Occurs in woodland, sclerophyll forest, open forest and tall open forest. Usually found in close association with wet microhabitats such as the margins of swamps, lagoons and creeks. (DAWE, 2008)	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
BIRDS						
Botaurus poiciloptilus (Australasian Bittern)		EN	1	Likely to occur	Found mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate.	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
Calidris ferruginea (Curlew Sandpiper)		CE, Mi (W)	1	Likely to occur	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
Corcorax melanorhamphos (White-winged Chough)	R		2	2016	Woodlands and tall Mallee. Favouring wetter areas with abundant litter for foraging.	**Possible.** Although habitat is limited within the Project Area, birds occurring in nearby habitat may

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
						occasionally forage in the area impacted.
Falco hypoleucos (Grey Falcon)		VU, Mi	1	Likely to occur	The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.	**Unlikely.** The Project Area is a high rainfall area.
Falcunculus frontatus ssp. *frontatus* (Eastern Shrike-tit)	R		2	2017	*Eucalyptus* woodlands and forest, within a wide range of woodland/forest communities.	**Possible.** Although habitat is limited within the Project Area, birds occurring in nearby habitat may occasionally forage in the area impacted. Unlikely to use scattered trees.
Gallinago hardwickii (Latham's Snipe)	R	MI	1	Likely to occur	Soft wet ground or shallow water with emergent vegetation such as tussocks and other green growth	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
Grantiella picta (Painted Honeyeater)		VU	1	Likely to occur	Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries.	**Possible.** Although habitat is limited within the Project Area, birds occurring in nearby habitat may occasionally forage in the area impacted. Unlikely to use scattered trees.
Hirundapus caudacutus (White-throated Needletail)		VU, Mi (T)	1	Likely to occur	Almost exclusively aerial in Australia, recorded most commonly above wooded areas.	**Possible.** Flyover only, therefore unlikely to be impacted by the Project.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Melithreptus gularis (Black-chinned Honeyeater)	V		2	2009	Habitat is drier woodlands woodlands, often no understorey (Simpson and Day 1999).	**Possible.** Suitable habitat within the Project Area and nearby records.
Neophema elegans elegans (Elegant Parrot)	R		2	2017	The Elegant Parrot occurs in eastern parts of South Australia, north to the Flinders Ranges and west to the Eyre Peninsula. Inhabiting open habitats, the Elegant Parrot can be found in a wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland (BirdLife Australia, 2020).	**Possible.** Suitable habitat within the Project Area and nearby records.
Oxyura australis (Blue-billed Duck)	R		2	2007	Endemic to south-eastern and south-western Australia. Habitat is permanent swamps with dense vegetation. Large open lakes, tidal inlets and bays (Simpson and Day 1999, p. 60).	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
Rostratula australis (Australian Painted Snipe)		EN	1	Likely to occur	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (*Melaleuca*).	**Unlikely.** Although nearby wet areas, habitat suitable for this species does not occur within the Project Area.
Spatula rhynchotis (Australasian Shoveler)	R		2	1998	The Australasian Shoveler is found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	**Unlikely.** No large wetlands present in the Project Area.
Tringa nebularia (Greenshank)		Mi (W)	1	Likely to occur	This species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats,	**Unlikely.** Although nearby wet areas, habitat suitable for this species

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
					typically with large mudflats and saltmarsh, mangroves or seagrass.	does not occur within the Project Area.
MAMMALS						
Pteropus poliocephalus (Grey-headed Flying-fox)	V	VU	1,2	2020, likely to occur	Forests and woodlands	**Possible.** This species may utilise Eucalyptus trees within the Project Area for foraging, especially trees that are above 5 m.
Trichosurus vulpecula (Common Brushtail Possum)	R		2	2020	*Eucalyptus* and Sheoak woodlands. Arboreal mammals requiring large tree hollows and hollow logs in which to nest.	**Likely.** Habitat in the Project Area may provide few nesting hollows, however would provide foraging resources for Common Brushtail Possums inhabiting nearby/adjoining vegetation and hollows in paddock trees
AMPHIBIANS						
Litoria raniformis (Growling Grass Frog)		VU	1	Likely to occur	This species is 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. Additionally, this species occurs in; clays or well-watered sandy soils; open grassland, open forest, and ephemeral and permanent non-saline marshes and swamps; steep-banked water edges (like ditches and drains) and gently graded edges containing fringing plants; and formerly, areas of high altitudes.	**Possible.** May occur in adjacent creek line, however, vegetation within Project Area does not provide suitable habitat.

Source: 1= PMST, 2 = NatureMaps, 3 – Observed/recorded in the field.
NPW Act: E= Endangered, V = Vulnerable, R= Rare.
EPBC Act: Ex = Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory

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 42 scattered trees.

Potential indirect impacts of the Project include:

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

There is a potential 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 as a drain runs underneath and then parallel to the road in areas.

Other works conducted under the Commissioner of Highways are also proposed along this road. This includes 5 intersection upgrades from Wistow to Gemmell totalling 1.18 ha of vegetation clearance and 32 scattered trees. Additionally, vegetation is proposed to be cleared for another overtaking lane from south of the Bugle Ranges to Gemmell Road requiring 79 trees and 0.11 ha of vegetation to be cleared.

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

An options assessment was undertaken to select a preferred overtaking lane location within the nominated study area from a shortlist of 4 options. Vegetation was a key value criteria within this assessment, which was balanced against other operational and safety considerations. In general, the road corridor along Long Valley Road is characterised by densely vegetated verges. Other options considered would have comparable impacts in terms of the extent or type of clearing required. Therefore, it is unlikely that clearance associated with the proposed intersection upgrades can be avoided or located elsewhere.

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).

Following selection of the preferred location, the design has been developed with a view to minimise the earthworks footprint by steepening batters and adopting design minima. The design has also aimed to contain road widening to the western side of the road, preserving vegetation on the eastern side. Moreover, pavements adjacent to the preserved eastern side are to be predominantly resealed/overlayed to negate the need for pavement boxout and impact on tree roots. Additionally, where possible, impacts to trees with high biodiversity value have been minimised, for example, from the 30% design to the 100% design, five trees containing hollows (including one with a biodiversity value over

10) have been retained. During construction of the new drain line and culvert, trees 34 and 42 to 47 will be retained where possible by pruning instead of total clearance.

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.

No onsite rehabilitation will occur with this clearance as roadsides are not secure locations for replanting due to the potential for future construction and maintenance activities. As part of the designs, woody declared weeds (such as *Olea europaea*) will be cleared within the Project Area.

c) 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.

Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised should be offset by implementing an SEB that outweighs that impact. Biodiversity offsets address any residual impacts after prevention and mitigation measures have been implemented.

The NVC will only approve clearances if these steps have been fulfilled. Offsetting is only considered by the NVC when a proponent has identified and documented appropriate measures to avoid and minimise negative impacts (direct or indirect) on biodiversity. Biodiversity offsets are only appropriate for projects that have rigorously applied the Mitigation Hierarchy to the fullest extent. Offsets must never be used to circumvent responsibilities to avoid and minimise damage to biodiversity and the NVC will consider this when determining whether the clearance can proceed.

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 8. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
Principle 1(b) – significance as a habitat for wildlife	Relevant information A total of 16 native bird species and one reptile species were recorded in the Project Area during the fauna assessment and none of these species were State or EPBC listed. Four invasive fauna species was also recorded including European Rabbit, European Goldfinch, House Sparrow and Common Blackbird. Two nationally listed threatened fauna species were assessed as possibly occurring within the Project Area: • *Pteropus poliocephalus* (Grey-headed Flying-fox); and • *Litoria raniformis* (Growling Grass Frog). Nine State threatened fauna species were also assessed as possibly occurring within the Project Area as they had recorded observations since 1995 within 5 km of the Project Area. • *Corcorax melanorhamphos* (White-winged Chough); • *Falcunculus frontatus* ssp. *frontatus* (Crested Shrike-tit); • *Grantiella picta* (Painted Honeyeater); • *Oxyura australis* (Blue-billed Duck); • *Spatula rhynchotis* (Australasian Shoveler); • *Melithreptus gularis* (Black-chinned Honeyeater); • *Neophema elegans elegans* (Elegant Parrot); • *Trichosurus vulpecula* (Common Brushtail Possum); • *Morelia spilota* (Carpet Python); • *Eulamprus heatwolei* (Yellow-bellied Water Skink). Trees; Fauna Habitat Score – 1.4 Total Unit Biodiversity Score – various across 42 trees (between 0.20 & 12.01).

	Assessment against the principles Seriously at Variance - All scattered trees
	Moderating factors that may be considered by the NVC The known camp for Grey-headed Flying foxes is located approximately 42 km from the Project Area and therefore, is most likely used for foraging and not considered important vegetation for this species. There are nearby creeks and drains that would be suitable habitat for the Growling grass frog, however, there are no nearby records and no known populations occur in this area. No trees with large or medium hollows (suitable breeding habitat) for Common Brushtail Possums are proposed to be removed. Therefore, it is considered that the moderating factors could be applied.
Principle 1(c) – plants of a rare, vulnerable or endangered species	Relevant information One threatened plant species is to be impacted by the proposed works, Tree 38 a *Eucalyptus fasciculosa* (Pink Gum). Threatened Flora Score(s) – Tree 38 = 0.3; all other scattered trees =0
	Assessment against the principles At Variance Tree 38
	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 – 0
	Assessment against the principles Not at variance
	Moderating factors that may be considered by the NVC N/A

3.6. Risk assessment

The level of risk associated with the application

Table 9. Summary of the level of risk associated with the application.

Total clearance	No. of trees	42
	Area (ha)	-
	Total biodiversity Score	127.96
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1 (b)
Risk assessment outcome		Level 4

4. Clearance summary

Scattered trees Summary table

***Note: Trees with "*" next to diameter have been estimated as the tree was unable to be accessed due to safety concerns. Trees with "#" are estimates as they were on private property and unable to be measured. Photos of the trees are provided in Appendix 2.**

Tree /Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment
11	1	**1.4**	**0**	3.32	1.0	3.49	$2,547.92
12	1	**1.4**	**0**	7.17	1.0	7.53	$5,496.10
49	1	**1.4**	**0**	0.58	1.0	0.61	$446.36
50	1	**1.4**	**0**	4.72	1.0	4.96	$3,617.52
51	1	**1.4**	**0**	0.43	1.0	0.45	$328.47
52	1	**1.4**	**0**	2.14	1.0	2.25	$1,640.50
20	1	**1.4**	**0**	6.23	1.0	6.54	$4,771.05
21	1	**1.4**	**0**	4.85	1.0	5.10	$3,718.94
23	1	**1.4**	**0**	3.59	1.0	3.77	$2,754.29
23 *	1	**1.4**	**0**	0.36	1.0	0.37	$272.80
24	1	**1.4**	**0**	3.42	1.0	3.59	$2,620.92
24	1	**1.4**	**0**	3.30	1.0	3.46	$2,527.73
26	1	**1.4**	**0**	6.62	1.0	6.95	$5,071.34
27	1	**1.4**	**0**	6.95	1.0	7.30	$5,328.48
29	1	**1.4**	**0**	6.08	1.0	6.38	$4,656.56
29	1	**1.4**	**0**	5.93	1.0	6.23	$4,547.15
29	1	**1.4**	**0**	6.72	1.0	7.06	$5,150.96
30	1	**1.4**	**0**	12.01	1.0	12.61	$9,204.00
31	1	**1.4**	**0**	3.69	1.0	3.87	$2,826.51
32	1	**1.4**	**0**	7.37	1.0	7.74	$5,646.27
33	1	**1.4**	**0**	3.99	1.0	4.19	$3,057.26
33	1	**1.4**	**0**	1.09	1.0	1.15	$837.26
33	1	**1.4**	**0**	1.02	1.0	1.07	$782.72
34	1	**1.4**	**0**	1.29	1.0	1.35	$986.50
34	1	**1.4**	**0**	0.58	1.0	0.61	$443.86
35	1	**1.4**	**0**	2.06	1.0	2.16	$1,576.29
36	1	**1.4**	**0**	2.39	1.0	2.51	$1,834.56
36	1	**1.4**	**0**	2.39	1.0	2.51	$1,834.56
37	1	**1.4**	**0**	2.21	1.0	2.33	$1,697.21
38	1	**1.4**	**0.3**	4.47	1.0	4.70	$3,429.05
39	1	**1.4**	**0**	0.44	1.0	0.46	$339.05
39	1	**1.4**	**0**	0.44	1.0	0.46	$339.05
40	1	**1.4**	**0**	0.26	1.0	0.27	$197.34
41	1	**1.4**	**0**	0.25	1.0	0.26	$190.17
42	1	**1.4**	**0**	1.29	1.0	1.35	$987.79

43	1	**1.4**	**0**	1.13	1.0	1.19	$867.63
44	1	**1.4**	**0**	0.62	1.0	0.65	$476.31
45	1	**1.4**	**0**	3.41	1.0	3.58	$2,610.62
46	1	**1.4**	**0**	2.17	1.0	2.28	$1,663.97
47	1	**1.4**	**0**	0.45	1.0	0.48	$347.26
48	1	**1.4**	**0**	0.31	1.0	0.33	$237.44
53	1	**1.4**	**0**	0.20	1.0	0.21	$154.34
Total	42			127.96		134.36	**$93,531.07**

Totals summary table

	Total Biodiversity score	**Total SEB points required**	**SEB Payment**	**Admin Fee**	**Total Payment**
Application	127.96	134.36	$93,394.37	$5,136.69	$98,531.07

Economies of Scale Factor	0.5
Rainfall (mm)	527

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:

GHD Pty Ltd proposes to achieve the SEB by paying into the Native Vegetation Fund. The total SEB payment required for the clearance of 42 scattered trees is **$98,531.07** which includes an administration fee of $5,136.69 including GST.

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7. Appendices

Appendix 1. List of flora species observed within the Project Area.

Species	Common Name	Introduced
Acacia cyclops	Coastal Wattle	
Acacia paradoxa	Kangaroo Thorn	
Acacia pendula	Weeping Myall	
Acacia pycnantha	Golden Wattle	
Acacia sp.		
Allocasuarina verticillata	Drooping Sheoak	
Billardiera heterophylla	Bluebell Creeper	*
Callistemon rugulosus	Scarlet Bottlebrush	
Callitris Glaucophylla	White Cypress	
Corymbia maculata	Spotted Gum	
Cupressus sp.		
Eucalyptus camaldulensis	River Red Gum	
Eucalyptus cladocalyx	Sugar Gum	
Eucalyptus cosmophylla	Cup Gum	
Eucalyptus fasciculosa	Pink Gum	
Eucalyptus lansdowneana	Red-Flowered Mallee Box	
Eucalyptus leucoxylon	SA Blue Gum	
Eucalyptus platypus	Moort	
Eucalyptus resinifera	Red Mahogany	
Eucalyptus sp.		
Eucalyptus sp. (WA)		
Eucalyptus spathulata	Swamp Mallet	
Eucalyptus viminalis	Manna Gum	
Foeniculum vulgare	Fennel	*
Fraxinus sp.	Desert Ash	*
Grevillia sp		
Hakea laurina	Pincusion Hakea	
Hakea sp.		
Hyacinthoides hispanica	Bluebells	*
Lolium perenne	Perennial ryegrass	*
Lycium ferocissimum	African Boxthorn	*
Melaleuca sp.		
Melaleuca lanceolata	Black Paperbark	
Melaleuca nesophila	Showy Honey Myrtle	
Melaleuca uncinata	Broombush	
Olea europaea	Olive	*
Opuntia stricta	Prickly Pear	*
Panicum miliaceum	Common millet	*
Pennisetum clandestinum	Kikuyu grass	*
Pinus radiata	Monterey pine	

Species	Common Name	Introduced
Salvia rosmarinus	Rosemary	*
Sambucus nigra	Elderberry	*
Scabiosa atropurpurea	Pincushion plant	*
Schinus molle	Pepper tree	*
Sonchus oleraceus	Common sowthistle	*
Ulex europaeus	Gorse	*

Appendix 2. Photos of scattered trees proposed for clearance.

<table>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Tree ID # 11</td><td>Eucalyptus camaldulensis</td><td>Tree ID # 12</td><td>Eucalyptus camaldulensis</td></tr>
</table>

Tree ID # 49	*Eucalyptus camaldulensis*

Tree ID # 50	*Eucalyptus camaldulensis*

Tree ID # 51	*Eucalyptus camaldulensis*

Tree ID # 52	*Eucalyptus camaldulensis*

Tree ID # 20	*Eucalyptus camaldulensis*

Tree ID # 21	*Eucalyptus camaldulensis*

Tree ID # 24a	*Eucalyptus camaldulensis*

Tree ID # 24b	*Eucalyptus camaldulensis*

Tree ID # 23	*Eucalyptus camaldulensis x 2*

Tree ID # 26	*Eucalyptus camaldulensis*

Tree ID # 26	*Continued – trunk of tree*

Tree ID # 27	*Eucalyptus camaldulensis*

Tree ID # 29a	*Eucalyptus viminalis*

Tree ID # 29b	*Eucalyptus viminalis*

Tree ID # 29c	*Eucalyptus viminalis*

Tree ID # 30	*Eucalyptus camaldulensis*


Tree ID # 30	Continued – trunk of tree. Left: east side of tree; right: North side of tree.

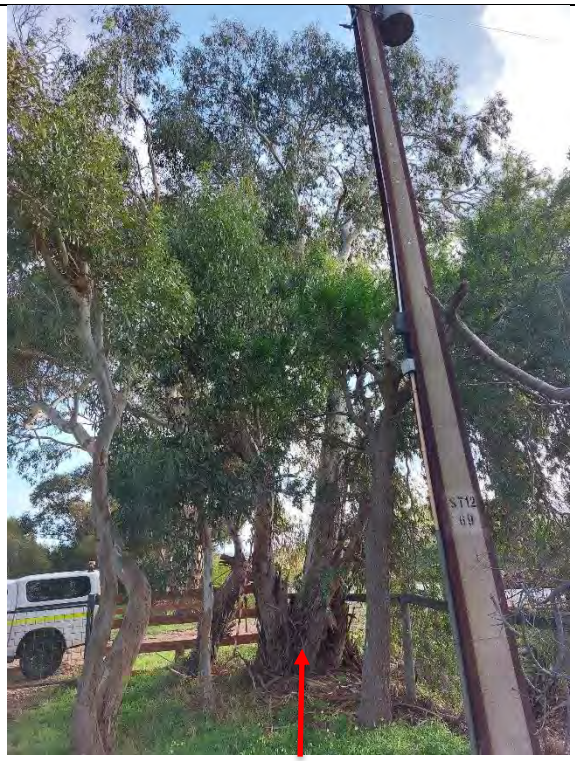

Tree ID # 31	*Eucalyptus camaldulensis*

Tree ID # 32	*Eucalyptus camaldulensis*

Tree ID # 33a	*Eucalyptus camaldulensis*

Tree ID # 33b	*Eucalyptus camaldulensis*

Tree ID # 33c	*Eucalyptus camaldulensis*



Tree ID # 34a	*Eucalyptus camaldulensis*

Tree ID 34b	*Eucalyptus camaldulensis*

Tree ID # 35	*Eucalyptus camaldulensis*

Tree ID # 36	*Eucalyptus camaldulensis*

			
Tree ID # 37	*Eucalyptus camaldulensis*	Tree ID # 38	*Eucalyptus fasciculosa*
			
Tree ID # 39	*Acacia pycnantha* (Group of 2)	Tree ID # 40	*Eucalyptus camaldulensis*

			
Tree ID # 41	*Eucalyptus camaldulensis*	Tree # 42	*Eucalyptus camaldulensis*

			
Tree ID # 43	*Eucalyptus leucoxylon*	Tree # 44	*Eucalyptus leucoxylon*

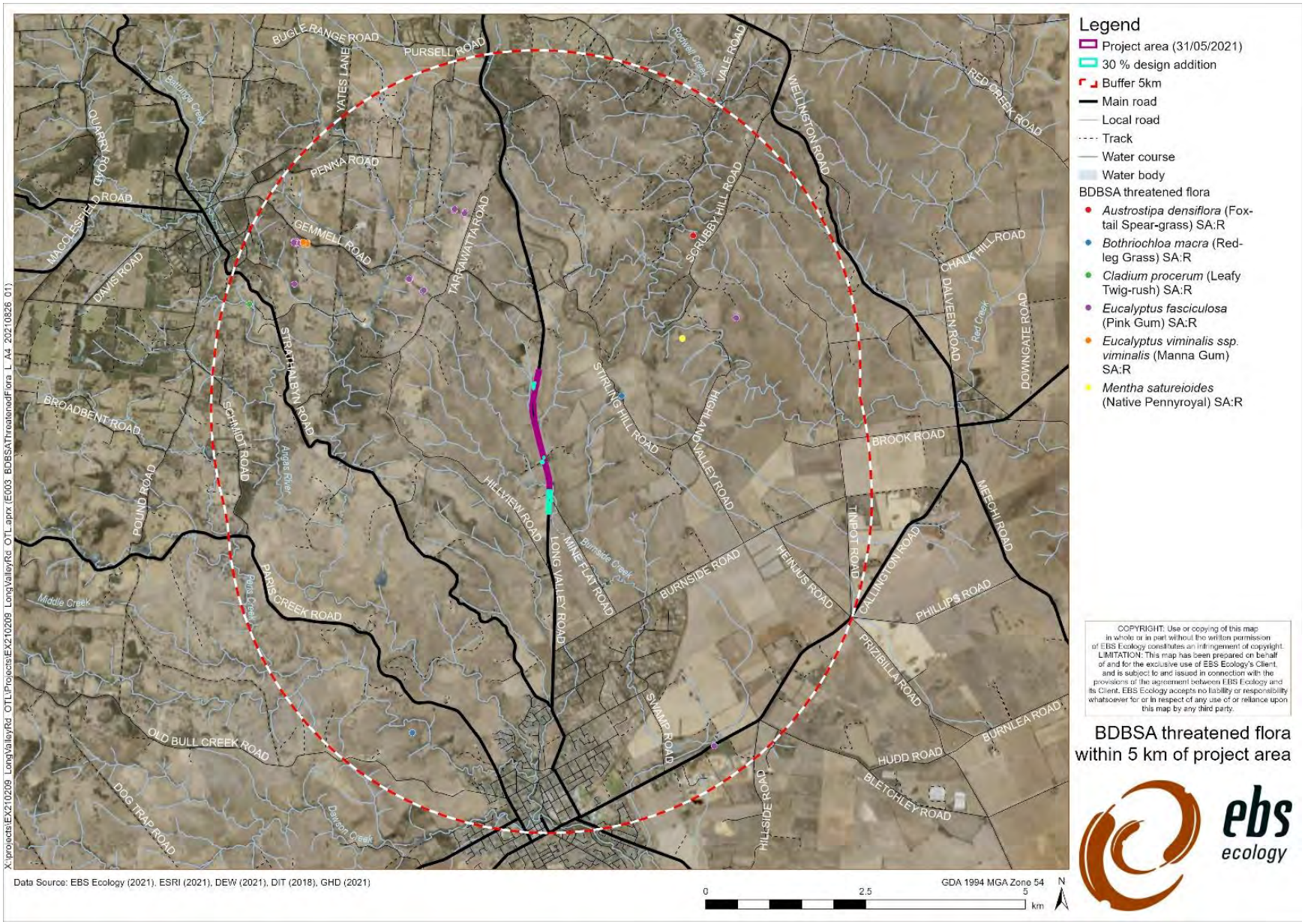
			
Tree ID # 45	*Eucalyptus leucoxylon*	Tree # 46	*Eucalyptus leucoxylon*

			
Tree ID # 47	*Eucalyptus leucoxylon*	Tree ID # 48	*Eucalyptus leucoxylon*

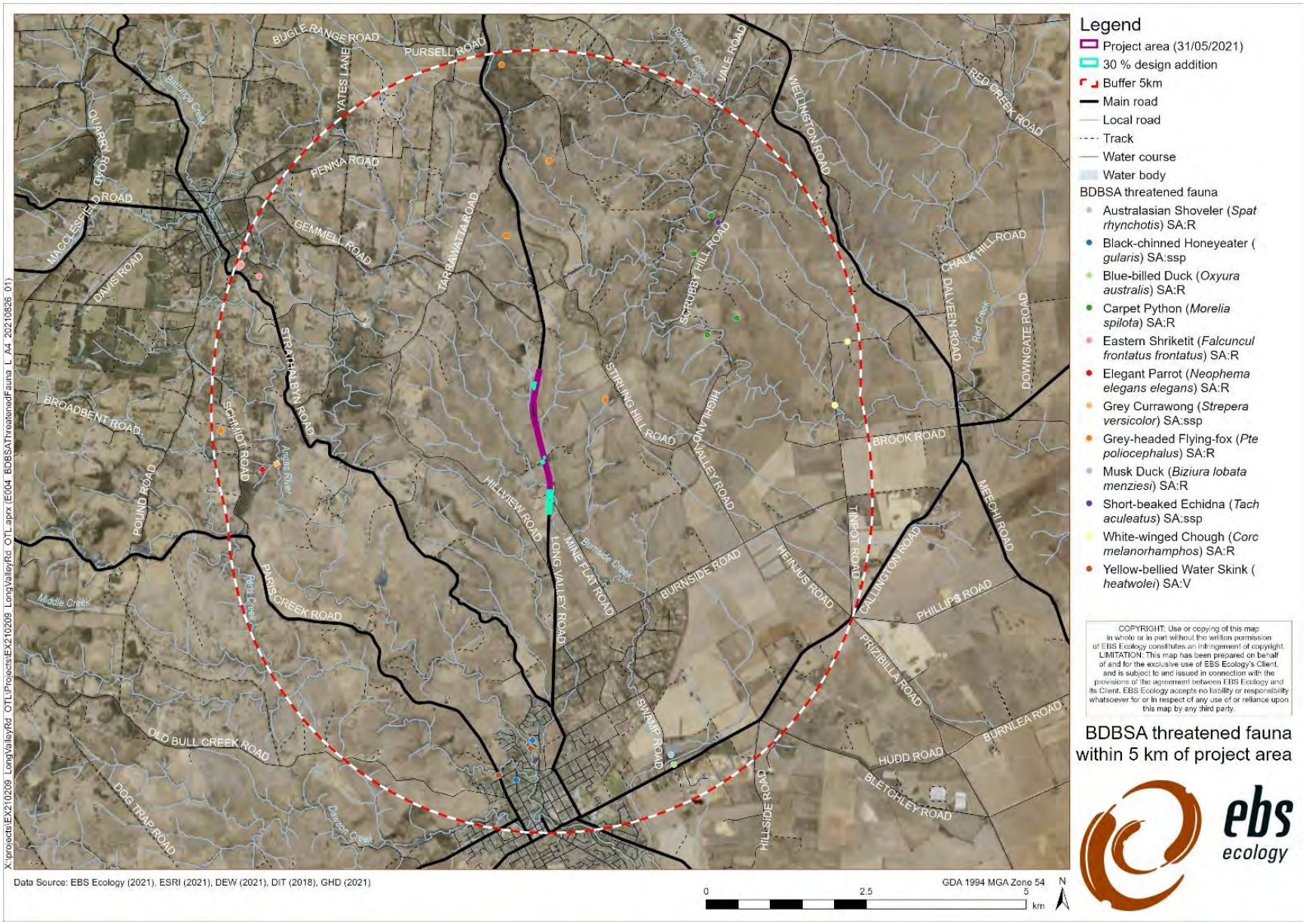
Tree ID # 53	*Eucalyptus camaldulensis*

Appendix 3. List of fauna species observed within the Project Area.

Species	Common Name	Introduced
Acanthiza chrysorrhoa	Yellow-rumped thornbill	
Aquila audax	Wedge-tailed eagle	
Carduelis carduelis	European Goldfinch	*
Corvus mellori	Little Raven	
Chelodina longicollis	Eastern Long-necked Turtle	
Dacelo novaeguineae	Laughing Kookaburra	
Eolophus roseicapilla	Galah	
Glossopsitta concinna	Musk Lorikeet	
Grallina cyanoleuca	Magpie-lark	
Gymnorhina tibicen	Australian Magpie	
Lichenostomus penicillatus	White-plumed Honeyeater	
Manorina melanocephala	Noisy Miner	
Oryctolagus cuniculus	European Rabbit	*
Pardalotus striatus	Striated Pardalote	
Passer domesticus	House Sparrow	*
Phylidonyris novaehollandiae	New Holland Honeyeater	
Platycercus elegans	Crimson Rosella	
Rhipidura leucophrys	Willie Wagtail	
Trichoglossus moluccanus	Rainbow Lorikeet	
Turdus merula	Common Blackbird	*



Appendix 4. Locations of threatened flora species identified by the BDBSA search.



Appendix 5. Locations of threatened fauna species identified by the BDBSA search.

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