

# Native Vegetation Clearance

## Murraylands Road, Morgan to Blanchetown

### Data Report

Clearance under the *Native Vegetation Regulations 2017*

31 March 2023

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



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31 March 2023

Version 3 - Final

Prepared by for Laka Earthmoving Contractors Pty Ltd (Laka)

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Project Number: EX220202B

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Cover photograph: *Eucalyptus gracilis* (Red Mallee) trees located within the Project Area.

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# Glossary and abbreviations

<b>%</b>	Percent
<b>BAM</b>	Bushland Assessment Method
<b>BDBSA</b>	Biological Database of South Australia (maintained by DEW)
<b>DCCEEW</b>	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
<b>DEW</b>	Department for Environment and Water (South Australia)
<b>DIT</b>	Department for Infrastructure and Transport
<b>EBS</b>	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
<b>EPBC Act</b>	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
<b>ha</b>	Hectare(s)
<b>IBRA</b>	Interim Biogeographical Regionalisation of Australia
<b>km</b>	Kilometre(s)
<b>Laka</b>	Laka Earthmoving Contractors Pty Ltd
<b>MBC</b>	Mallee Bird Community of the Murray Darling Depression Bioregion
<b>MM</b>	Maintenance Marker
<b>NatureMaps</b>	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
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1972</i>
<b>NV Act</b>	<i>Native Vegetation Act 1991</i>
<b>NVC</b>	Native Vegetation Council
<b>PMST</b>	Protected Matters Search Tool (under the EPBC Act; maintained by DCCEEW)
<b>Project</b>	The realignment of Murraylands Road between Morgan to Blanchetown
<b>Project Area</b>	Murraylands Road, between Morgan and Blanchetown, South Australia
<b>SA</b>	South Australia(n)
<b>Search Area</b>	5 km buffer of the Project Area considered in the desktop assessment database searches
<b>SEB</b>	Significant Environmental Benefit
<b>sp.</b>	Species
<b>spp.</b>	Species (plural)
<b>ssp.</b>	Sub-species
<b>STAM</b>	Scattered Tree Assessment Method
<b>TEC</b>	Threatened Ecological Community
<b>TPZ</b>	Tree Protection Zone
<b>var.</b>	Variety (a taxonomic rank below that of species and subspecies, but above that of form)
<b>VA(s)</b>	Vegetation association(s)

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**Attachments**

- Attachment 1 – EX220202 Murraylands Road BAM Scoresheets
- Attachment 2 – Preliminary Design Drawings

# 1. Application information

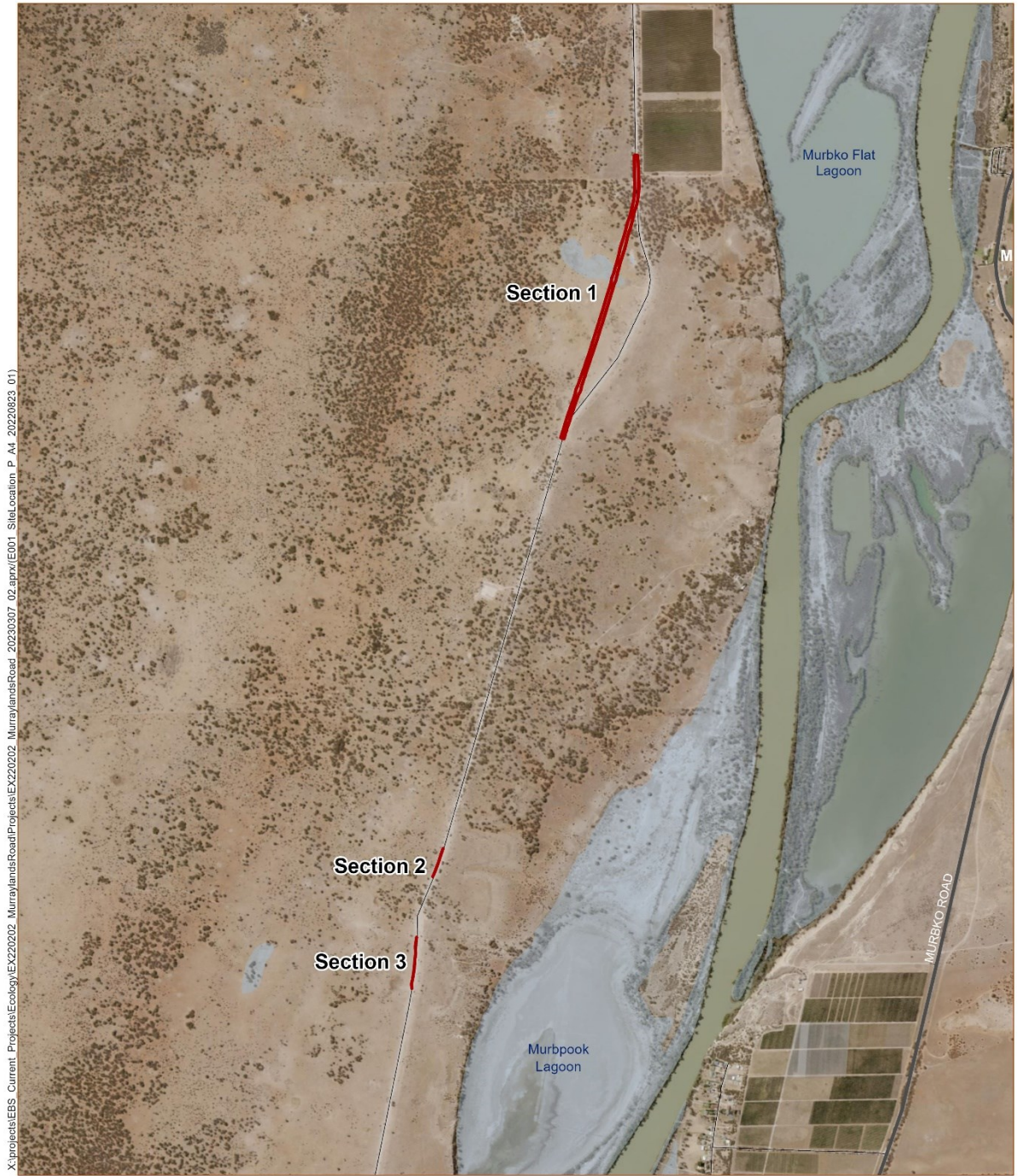
**Table 1. Application details.**

<b>Applicant:</b>	Laka Earthmoving Contractors Pty Ltd (Laka)		
<b>Key contact:</b>	David Lockett Operations Manager & OHS Officer		
<b>Landowner:</b>	Managed by Mid Murray Council and the Department for Infrastructure (DIT) (Road number 7170)		
<b>Site Address:</b>	Murraylands Road, between Morgan and Blanchetown, South Australia (Maintenance Marker (MM) 14) to (MM 16)		
<b>Local Government Area:</b>	Mid Murray Council	<b>Hundred:</b>	Eba and Hay
<b>Title ID:</b>	N/A – road reserve	<b>Parcel ID</b>	N/A – road reserve

**Table 2. Summary of the proposed clearance.**

<b>Purpose of clearance:</b>	Clearance is required for the road realignment and upgrade of a section of Murraylands road (the Project) between Morgan and Blanchetown (The Project Area). Structural improvements to the road including extending the width of the sealed road will increase its load capacity for heavy vehicles, enhance access for primary producers and improve safety for both freight and passenger vehicles.
<b>Native Vegetation Regulation:</b>	Regulation 12, Schedule 1; clause 34, Infrastructure.
<b>Description of the vegetation under application:</b>	<ul style="list-style-type: none"> <li>• 0.885 hectares (ha) of A1a: <i>Zygophyllum aurantiacum</i> +/- with <i>Lycium australe</i> with emergent <i>Acacia nyssophylla</i> and <i>Myoporum platycarpum</i> open shrubland.</li> <li>• 0.885 ha of A1b: <i>Sclerolaena patenticuspis</i> +/- <i>Oxalis perennans</i> with <i>Rytidosperma sp.</i> very low open shrubland.</li> <li>• 0.555 ha of A2: <i>Eucalyptus oleosa</i> open mallee woodland over <i>Zygophyllum aurantiacum</i> with <i>Maireana pentatropis</i> low shrubland.</li> <li>• 0.046 ha of B1: <i>Zygophyllum aurantiacum</i> with <i>Maireana pentatropis</i> low open shrubland.</li> <li>• 0.080 ha of C1: <i>Zygophyllum aurantiacum</i> with <i>Maireana brevifolia</i> low shrubland.</li> </ul>
<b>Total proposed clearance – area (ha) and/or number of trees:</b>	2.450 ha
<b>Level of clearance:</b>	Level 4
<b>Overlay (Planning and Design Code):</b>	Native Vegetation Overlay

**Map of proposed clearance area:**



X:\projects\EBS\_Current\_Projects\Ecology\EX220202\_MurraylandsRoad\Projects\EX220202\_MurraylandsRoad\_20230307\_02.aprx\{E001\_SiteLocation\_P\_A4\_20220823\_01}

Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)



- Legend**
- Project Area
  - Main road
  - Local road
  - Water course
  - Water body



<b>Mitigation Hierarchy:</b>	<p><b>Avoidance</b></p> <p>As the road realignment needs to adjoin as a continuation of the existing road, construction is required next to the existing Murraylands Road at the curves. Section 1 of the road realignment is within an area which consists of less intact native vegetation. Sections 2 and 3 will consist of verge widening to lessen the apex of their respective road curves. As complete native vegetation avoidance is not possible and alternative alignments beyond the road corridor without vegetation are not available the project needed to focus on measures to minimise the impacts as discussed in section (b) Minimization below.</p> <p>The project sought to initially identify and minimise vegetation impacts by avoiding as many scattered trees as possible in Section 1 of the road realignment.</p> <p>The area of Section 1 consists of several scattered <i>Eucalyptus gracilis</i> and <i>Eucalyptus oleosa</i> trees, which will be avoided as much as possible.</p> <p>Laka and members from the Mid Murray Council attended the site in early February 2023 to review preliminary designs and implemented a plan to avoid large remnant scattered trees, particularly those with hollows which provide habitat for fauna. Four large remnant trees containing hollows of various sizes which were initially highlighted in the field survey, will be avoided.</p> <p><b>Minimization</b></p> <p>The vegetation proposed for removal is the minimum possible to allow for the road realignment as it is limited by safety restrictions and road construction requirements. The pruning of trees rather than the complete removal of trees where applicable will be preferred by the client.</p> <p>The Project intends to use batters which will be flattened to allow for a reduction in clearance distance where trees are adjacent to the newly proposed road in the northern part of section 1. Furthermore, where applicable, swales alongside the proposed road will be cut in, in order to minimise impact on existing tree roots.</p> <p><b>Rehabilitation or restoration</b></p> <p>The road realignment is permanent land clearance that is unlikely to be rehabilitated or restored.</p>
	<b>SEB Offset proposal</b>



# 2. Purpose of clearance

## 2.1. Description

Mid Murray Council is undertaking upgrades and sealing of Murraylands Road, the works will significantly improve an 8 kilometre (km) stretch of Murraylands Road between Blanchetown and Morgan, which serves as a critical freight route. Structural improvements to the road including extending the width of the sealed road will increase its load capacity for heavy vehicles, enhance access for primary producers and improve safety for both freight and passenger vehicles. The upgrade will also allow larger capacity freight vehicles to use the route, reducing the overall number of heavy vehicles needed to transport freight in the area.

EBS Ecology was engaged by Laka on behalf of the Mid Murray Council to assess vegetation for the road realignment of the Murraylands Road, which includes relocating 1.2 km of road in Section 1 of the Project Area and widening the curves at two locations – Section 2 and Section 3 of the Project Area. The Project Area extends from approximately 16.5 km north of Blanchetown to approximately 15 km south of Morgan, South Australia (SA).

Section 1 of the road realignment consists of approximately 1.36 km of vegetation clearance on one side of the road, with sections 2 and 3 consisting of verge widening of 3 metres (m) on one side of the road.

The road realignment Project also includes the construction of a fence along the west side of the new road.

The Project design involves the clearance of 2.450 ha of low shrublands and mallee vegetation.

Design drawings (as delivered to EBS by Laka on 15/02/2023) of the proposed works are attached in Attachment 2.

### Objectives

EBS Ecology were engaged to undertake a flora and fauna assessment for the proposed road realignment 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 Tree Assessment Method (STAM); and
- Calculate the Significant Environmental Benefit (SEB) offset requirements based on the impact footprint.

## 2.2. Background

### Current and surrounding land use

The Project Area consists of roadside vegetation on and vegetation on crown land in the District Council of Mid Murray. The Project Area is surrounded by agricultural land and farmland (DEW 2023). The River Murray Protection Area is located within 5 km of the Project Area, with the nearest National Parks and Wildlife SA reserves being Morgan Conservation Park, Brookfield Conservation Park, and Roonka Conservation Park.

## **Administrative boundaries**

The Project Area occurs within the Mid Murray Council Area, Murraylands and Riverland Landscape Management Region, Eba and Hay Hundreds and Eyre County.

## **Bioregions**

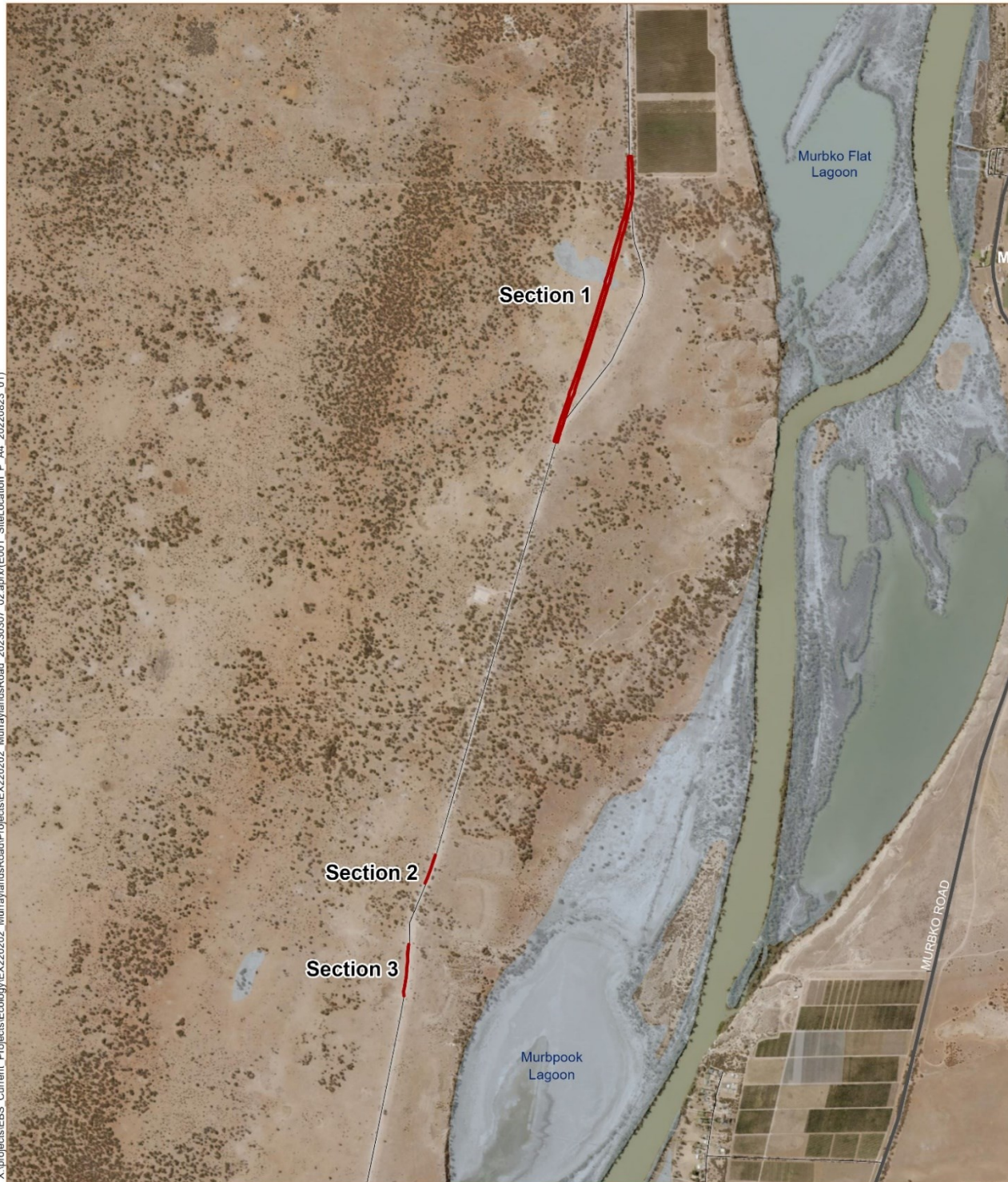
The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation, and species information. The bioregions are further refined into subregions and environmental associations. The Project Area is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

Approximately 21 percent (%) (444,401 ha) of the Murray Mallee IBRA Subregion and approximately 67% (156,356 ha) of the Blanchetown IBRA Environmental Association is mapped as remnant vegetation. Of this, 4% (76,180 ha) and 16% (34,453 ha) is formerly conserved and protected, respectively (DCCEEW 2023a).

## **2.3. General location map**

The location of the road realignment is displayed in Figure 1. The Project Area is located 16.5 km north of Blanchetown to approximately 15 km south of Morgan.

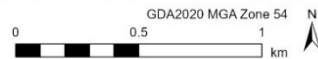
X:\projects\EBS\_Current\_Projects\Ecology\EX220202\_MurraylandsRoad\Projects\EX220202\_MurraylandsRoad\_20230307\_02.aprx\EC001\_SiteLocation\_P\_A4\_20220823\_01)



Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)



- Legend**
-  Project Area
  -  Main road
  -  Local road
  -  Water course
  -  Water body



**Figure 1. Proposed clearance area for 3 sections of road realignment along Murraylands Road between Morgan and Blanchetown, South Australia.**

## 2.4. Details of the proposal

The proposed clearance area for the road realignment includes clearance of vegetation that runs adjacent to Murraylands Road. Clearance in Section 1 as a part of the road realignment is proposed to the west of the existing road. The layout of the proposed realignment is provided in Figure 1.

## 2.5. Approvals required or obtained

*Environment Protection and Biodiversity Conservation Act 1999* – EPBC approval is unlikely to be required for this project

*Native Vegetation Act 1991* – This application.

*National Parks and Wildlife Act 1972* – EBS has the required flora collection permit (K25613-22).

*Landscape South Australia Act 2019* – A Water Affecting Activity Permit is unlikely to be required for this Project; A permit to transport declared weeds on a public road may be required for this Project.

*Planning, Development and Infrastructure Act 2016* – Approval is not required for this Project.

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

## 2.6. Native Vegetation Regulation

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

### **Regulation 12 (34) – Infrastructure**

Clearance of vegetation:

- a. Incidental to the construction or expansion of a building or infrastructure where the Minister has, by instrument in writing, declared that the Minister is satisfied that the clearance is in the public interest; or
- b. Required in connection with the provision of infrastructure or services to a building or proposed building, or to any place,

provided that any development authorisation required by or under the *Planning, Development and Infrastructure Act 2016* has been obtained.

The *Native Vegetation Regulations 2017* define infrastructure as:

- (a) The infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, the provision of telecommunications, or the drainage, removal or treatment of waste water or sewage; or
- (b) Roads and their supporting structures or works; or
- (c) Ports, wharfs, jetties, railways, trams and busways.

# 3. Method

## 3.1. 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).

### 3.1.1. PMST report

A Protected Matters Search Tool (PMST) report was generated on 27 March 2023 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DCCEEW 2023b). 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. Aquatic species (such as fish, turtles, sharks, dolphins, whales, and frogs) were excluded from the assessment as the Project Area is terrestrial.

### 3.1.2. BDBSA data extract

A data extract from the Biological Database of South Australia (BDBSA) was obtained from the Department of Environment and Water (DEW) to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 26 July 2022; DEW 2022, Recordset number: DEWNRBDBSA220726-1). 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 DEW's 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.

### 3.1.3. 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 provides 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.

## 3.2. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant H. Merigot and G. Wilson on 3 August 2022 in accordance with the BAM (NVC 2020).

### 3.2.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft *et al.* 2009; Milne and Croft 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 2020).

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 scoresheets. 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.

## 3.3. 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 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. Weather conditions during the survey were favourable, with mild daytime temperatures.

# 4. Assessment outcomes

## 4.1. Vegetation assessment

### 4.1.1. General description of the vegetation, the site and matters of significance

Remnant bushland was found scattered throughout the Project Area. The vegetation found within Section 1 of the Project Area consists of medium sized, remnant trees, mainly of species *Eucalyptus oleosa* ssp. (Red Mallee) which were densely packed in some patches with an understorey comprising a range of native low shrubs. Sections 2 and 3 were similar with vegetation consisting of low scattered shrubland, although there was one small to medium sized native tree located directly adjacent the development footprint in Section 2. The understorey within the Project Area was largely dominated by *Zygophyllum aurantiacum* (Shrubby Twinleaf), *Maireana pentatropis* (Erect Mallee Bluebush) and *Carrichtera annua* (Ward's Weed). Along the existing roadway areas, the shoulder extends approximately 50 cm from the edge of the road before the vegetation begins.

Given the surrounding area is dominated by agricultural and livestock use, native vegetation in the Project Area represents some of the vegetation that has not been cleared in this area. No watercourses or wetlands are present on site.

The field survey recorded 46 flora species across the Project Area, 12 of which are introduced. A complete list of flora species observed in the Project Area is shown in [Appendix 1](#).

One State listed threatened species was recorded within the Project Area and was scattered by widespread across Vegetation Associations (VAs) A1a, A1b and C1:

- *Maireana pentagona* (Slender-Fissure Plant), State Rare.

Five native VAs were mapped as a result of the field survey (Table 4 to Table 8 & Figure 2 to Figure 4):

- **VA A1a** - *Zygophyllum aurantiacum* +/- with *Lycium australe* with emergent *Acacia nyssophylla* and *Myoporum platycarpum* open shrubland (Table 4);
- **VA A1b** – *Sclerolaena patenticuspis* +/- *Oxalis perennans* with *Rytidosperma* sp. very low open shrubland (Table 5);
- **VA A2** – *Eucalyptus oleosa* open mallee woodland over *Zygophyllum aurantiacum* with *Maireana pentatropis* low shrubland (Table 6);
- **VA B1** - *Zygophyllum aurantiacum* with *Maireana pentatropis* low open shrubland (Table 7); and
- **VA C1** - *Zygophyllum aurantiacum* with *Maireana brevifolia* low shrubland (Table 8).


One Declared flora species under the *Landscape South Australia Act 2019* was recorded in VA B1 of the Project Area:

- *Marrubium vulgare* (Horehound)

A total of 14 native fauna, consisting of 13 bird species and one mammal were recorded using the vegetation during the field survey. A list of fauna observed in the Project Area is provided in [Appendix 2](#).

#### 4.1.2. Details of the vegetation associations proposed to be impacted


Table 4. Summary of VA A1a.

<b>Vegetation Association</b>	Vegetation Association A1a – <i>Zygophyllum aurantiacum</i> +/- with <i>Lycium australe</i> with emergent <i>Acacia nyssophylla</i> and <i>Myoporum platycarpum</i> open shrubland.							
								
<b>General description</b>	Open shrubland where <i>Zygophyllum aurantiacum</i> and <i>Lycium australe</i> were the dominant species. Both <i>Acacia nyssophylla</i> and <i>Myoporum platycarpum</i> were regenerating. The understorey in this area was sparse and mainly consisted of annual forbs with the exception of <i>Zygophyllum aurantiacum</i> which was widespread. Introduced species including <i>Carrichtera annua</i> and <i>Erodium</i> spp. were widespread but in relatively low densities.							
	<table border="1"> <thead> <tr> <th data-bbox="341 1144 719 1178">Overstorey</th> <th data-bbox="719 1144 1099 1178">Midstorey</th> <th data-bbox="1099 1144 1482 1178">Understorey</th> </tr> </thead> <tbody> <tr> <td data-bbox="341 1178 719 1429"> <i>Myoporum platycarpum</i> ssp. <i>Acacia ligulata</i> </td> <td data-bbox="719 1178 1099 1429"> <i>Lycium australe</i> <i>Atriplex vesicaria</i> <i>Sclerolaena</i> sp. <i>Sclerolaena patenticuspis</i> <i>Acacia nyssophylla</i> <i>Dissocarpus paradoxus</i> <i>Maireana pentatropis</i> </td> <td data-bbox="1099 1178 1482 1429"> <i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Tetragonia tetragonoides</i> <i>Vittadinia</i> sp. <i>Wurmbea dioica</i> ssp.           </td> </tr> </tbody> </table>	Overstorey	Midstorey	Understorey	<i>Myoporum platycarpum</i> ssp. <i>Acacia ligulata</i>	<i>Lycium australe</i> <i>Atriplex vesicaria</i> <i>Sclerolaena</i> sp. <i>Sclerolaena patenticuspis</i> <i>Acacia nyssophylla</i> <i>Dissocarpus paradoxus</i> <i>Maireana pentatropis</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Tetragonia tetragonoides</i> <i>Vittadinia</i> sp. <i>Wurmbea dioica</i> ssp.	
Overstorey	Midstorey	Understorey						
<i>Myoporum platycarpum</i> ssp. <i>Acacia ligulata</i>	<i>Lycium australe</i> <i>Atriplex vesicaria</i> <i>Sclerolaena</i> sp. <i>Sclerolaena patenticuspis</i> <i>Acacia nyssophylla</i> <i>Dissocarpus paradoxus</i> <i>Maireana pentatropis</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Tetragonia tetragonoides</i> <i>Vittadinia</i> sp. <i>Wurmbea dioica</i> ssp.						
<b>Threatened species or community</b>	<p><b>TEC</b></p> <p>This community is not a Threatened Ecological Community.</p> <p><b>Threatened spp.</b></p> <p>Known</p> <ul style="list-style-type: none"> <li>- <i>Maireana pentagona</i> (Slender Fissure-Plant) (State Rare)</li> </ul> <p>Likely</p> <ul style="list-style-type: none"> <li>- <i>Trichosurus vulpecula</i> (Common Brushtail Possum) (State Rare);</li> <li>- <i>Corcorax melanorhamphos</i> (White-winged Chough) (State Rare);</li> </ul> <p>Possible</p> <ul style="list-style-type: none"> <li>- <i>Falco hypoleucos</i> (Grey Falcon) (nationally Vulnerable, State Rare);</li> <li>- <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State Rare);</li> <li>- <i>Myiagra inquieta</i> (Restless Flycatcher) (State Rare); and</li> </ul>							




	<ul style="list-style-type: none"> <li>- <i>Leipoa ocellata</i> (Malleefowl) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Philemon citreogularis citreogularis</i> (Little Friarbird) (State Rare).</li> </ul>				
<b>Landscape context score</b>	1.10	<b>Vegetation Condition Score</b>	39.79	<b>Conservation significance score</b>	1.14
<b>Unit biodiversity Score</b>	49.90	<b>Area (ha)</b>	0.885	<b>Total biodiversity Score</b>	44.14

**Table 5. Summary of VA A1b.**

<b>Vegetation Association</b>	Vegetation Association A1b – <i>Sclerolaena patenticuspis</i> +/- <i>Oxalis perennans</i> with <i>Rytidosperma</i> sp. very low open shrubland.							
								
<b>General description</b>	A very low open shrubland dominated by <i>Sclerolaena patenticuspis</i> and <i>Oxalis perennans</i> . Overstorey species were absent and introduced species, <i>Carrichtera annua</i> was present and spreading along the edge of this VA among other introduced species.							
	<table border="1"> <thead> <tr> <th data-bbox="341 1077 719 1115"><b>Overstorey</b></th> <th data-bbox="719 1077 1099 1115"><b>Midstorey</b></th> <th data-bbox="1099 1077 1482 1115"><b>Understorey</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="341 1115 719 1328">N/A</td> <td data-bbox="719 1115 1099 1328"> <i>Lycium australe</i>  <i>Enchylaena tomentosa</i> var. <i>tomentosa</i>  <i>Sclerolaena</i> sp.  <i>Sclerolaena patenticuspis</i>  <i>Maireana pentatropis</i> </td> <td data-bbox="1099 1115 1482 1328"> <i>Zygophyllum aurantiacum</i>  <i>Rytidosperma</i> sp.  <i>Oxalis perennans</i>  <i>Ptilotus spathulatus</i>  <i>Wurmbea dioica</i> ssp.                 </td> </tr> </tbody> </table>	<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>	N/A	<i>Lycium australe</i> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Sclerolaena</i> sp. <i>Sclerolaena patenticuspis</i> <i>Maireana pentatropis</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Ptilotus spathulatus</i> <i>Wurmbea dioica</i> ssp.	
<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>						
N/A	<i>Lycium australe</i> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Sclerolaena</i> sp. <i>Sclerolaena patenticuspis</i> <i>Maireana pentatropis</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Ptilotus spathulatus</i> <i>Wurmbea dioica</i> ssp.						
<b>Threatened species or community</b>	<p><b>TEC</b></p> <p>This community is not a Threatened Ecological Community.</p> <p><b>Threatened spp.</b></p> <p>Known</p> <ul style="list-style-type: none"> <li>- <i>Maireana pentagona</i> (Slender Fissure-Plant) (State Rare)</li> </ul> <p>Likely</p> <ul style="list-style-type: none"> <li>- <i>Trichosurus vulpecula</i> (Common Brushtail Possum) (State Rare);</li> <li>- <i>Corcorax melanorhamphos</i> (White-winged Chough) (State Rare);</li> </ul> <p>Possible</p> <ul style="list-style-type: none"> <li>- <i>Falco hypoleucos</i> (Grey Falcon) (nationally Vulnerable, State Rare);</li> <li>- <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State Rare);</li> <li>- <i>Myiagra inquieta</i> (Restless Flycatcher) (State Rare); and</li> <li>- <i>Leipoa ocellata</i> (Malleefowl) (nationally Vulnerable and State Vulnerable);</li> </ul>							


	<ul style="list-style-type: none"> <li>- <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Philemon citreogularis citreogularis</i> (Little Friarbird) (State Rare).</li> </ul>				
<b>Landscape context score</b>	1.10	<b>Vegetation Condition Score</b>	17.04	<b>Conservation significance score</b>	1.14
<b>Unit biodiversity Score</b>	21.37	<b>Area (ha)</b>	0.885	<b>Total biodiversity Score</b>	18.91

**Table 6. Summary of VA A2.**

<b>Vegetation Association</b>	Vegetation Association A2 – <i>Eucalyptus oleosa</i> open mallee woodland over <i>Zygophyllum aurantiacum</i> with <i>Maireana pentatropis</i> low shrubland.		
			
<b>General description</b>	An open mallee woodland dominated by <i>Eucalyptus oleosa</i> in the overstorey and <i>Zygophyllum aurantiacum</i> in the understorey. Larger, old trees contain hollows and dead timber that provide important fauna habitat. Introduced species were scarce with the exception of <i>Carrichtera annua</i> which was widespread.		
	<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>
	<i>Eucalyptus oleosa</i> ssp. <i>Eucalyptus gracilis</i> <i>Myoporum platycarpum</i>	<i>Atriplex vesicaria</i> <i>Lycium australe</i> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Sclerolaena diacantha</i> <i>Sclerolaena patentispis</i> <i>Maireana pentatropis</i> <i>Mariena sedifolia</i> <i>Teucrium</i> sp.	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Oxalis perennans</i> <i>Ptilotus spathulatus</i> <i>Wurmbea dioica</i> ssp. <i>Tetragonia</i> sp. <i>Einadia nutans</i>
<b>Threatened species or community</b>	<p><b>TEC</b></p> <p>The nationally Endangered Mallee Bird Community of the Murray Darling Depression Bioregion (MBC) occurs in this VA.</p> <p><b>Threatened spp.</b></p> <p>Known</p> <ul style="list-style-type: none"> <li>- <i>Maireana pentagona</i> (Slender Fissure-Plant) (State Rare)</li> </ul> <p>Likely</p> <ul style="list-style-type: none"> <li>- <i>Trichosurus vulpecula</i> (Common Brushtail Possum) (State Rare);</li> <li>- <i>Corcorax melanorhamphos</i> (White-winged Chough) (State Rare);</li> </ul> <p>Possible</p> <ul style="list-style-type: none"> <li>- <i>Falco hypoleucos</i> (Grey Falcon) (nationally Vulnerable, State Rare);</li> <li>- <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State Rare);</li> </ul>		


	<ul style="list-style-type: none"> <li>- <i>Myiagra inquieta</i> (Restless Flycatcher) (State Rare); and</li> <li>- <i>Leipoa ocellata</i> (Malleefowl) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Philemon citreogularis citreogularis</i> (Little Friarbird) (State Rare).</li> </ul>				
<b>Landscape context score</b>	1.10	<b>Vegetation Condition Score</b>	51.34	<b>Conservation significance score</b>	1.50
<b>Unit biodiversity Score</b>	84.71	<b>Area (ha)</b>	0.555	<b>Total biodiversity Score</b>	46.98

**Table 7. Summary of VA B1.**

<b>Vegetation Association</b>	Vegetation Association B1 – <i>Zygophyllum aurantiacum</i> with <i>Maireana pentatropis</i> low open shrubland.		
			
<b>General description</b>	A low open shrubland dominated by <i>Zygophyllum aurantiacum</i> and <i>Maireana pentatropis</i> . Overstorey species were absent in this VA with the majority of flora species observed in the midstorey. Introduced species were more prevalent in this VA with <i>Salvia verbenaca</i> var., and Declared weed species <i>Marrubium vulgare</i> present in localised patches.		
	<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>
	N/A	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patentispis</i> <i>Maireana pentatropis</i> <i>Maireana brevifolia</i> <i>Acacia nyssophylla</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Ptilotus spathulatus</i> <i>Vittadinia</i> sp.
<b>Threatened species or community</b>	<p><b>TEC</b></p> <p>This community is not a Threatened Ecological Community.</p> <p><b>Threatened spp.</b></p> <p>Known</p> <ul style="list-style-type: none"> <li>- <i>Maireana pentagona</i> (Slender Fissure-Plant) (State Rare)</li> </ul> <p>Likely</p> <ul style="list-style-type: none"> <li>- <i>Trichosurus vulpecula</i> (Common Brushtail Possum) (State Rare);</li> <li>- <i>Corcorax melanorhamphos</i> (White-winged Chough) (State Rare);</li> </ul> <p>Possible</p> <ul style="list-style-type: none"> <li>- <i>Falco hypoleucos</i> (Grey Falcon) (nationally Vulnerable, State Rare);</li> <li>- <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State Rare);</li> <li>- <i>Myiagra inquieta</i> (Restless Flycatcher) (State Rare); and</li> </ul>		

	<ul style="list-style-type: none"> <li>- <i>Leipoa ocellata</i> (Malleefowl) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Philemon citreogularis citreogularis</i> (Little Friarbird) (State Rare).</li> </ul>				
<b>Landscape context score</b>	1.10	<b>Vegetation Condition Score</b>	20.40	<b>Conservation significance score</b>	1.10
<b>Unit biodiversity Score</b>	24.68	<b>Area (ha)</b>	0.046	<b>Total biodiversity Score</b>	1.15

**Table 8. Summary of VA C1.**

<b>Vegetation Association</b>	Vegetation Association C1 – <i>Zygophyllum aurantiacum</i> with <i>Maireana brevifolia</i> low shrubland.							
								
<b>General description</b>	Low shrubland where the dominant species were <i>Zygophyllum aurantiacum</i> and <i>Maireana brevifolia</i> .							
	<table border="1"> <thead> <tr> <th data-bbox="341 1032 719 1070"><b>Overstorey</b></th> <th data-bbox="719 1032 1099 1070"><b>Midstorey</b></th> <th data-bbox="1099 1032 1479 1070"><b>Understorey</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="341 1070 719 1317">N/A</td> <td data-bbox="719 1070 1099 1317"> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i>  <i>Atriplex vesicaria</i>  <i>Sclerolaena patenticuspis</i>  <i>Maireana pentatropis</i>  <i>Maireana brevifolia</i>  <i>Acacia nyssophylla</i> </td> <td data-bbox="1099 1070 1479 1317"> <i>Zygophyllum aurantiacum</i>  <i>Rytidosperma</i> sp.  <i>Ptilotus spathulatus</i>  <i>Vittadinia</i> sp.                 </td> </tr> </tbody> </table>	<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>	N/A	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Maireana pentatropis</i> <i>Maireana brevifolia</i> <i>Acacia nyssophylla</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Ptilotus spathulatus</i> <i>Vittadinia</i> sp.	
<b>Overstorey</b>	<b>Midstorey</b>	<b>Understorey</b>						
N/A	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i> <i>Atriplex vesicaria</i> <i>Sclerolaena patenticuspis</i> <i>Maireana pentatropis</i> <i>Maireana brevifolia</i> <i>Acacia nyssophylla</i>	<i>Zygophyllum aurantiacum</i> <i>Rytidosperma</i> sp. <i>Ptilotus spathulatus</i> <i>Vittadinia</i> sp.						
<b>Threatened species or community</b>	<p><b>TEC</b></p> <p>This community is not a Threatened Ecological Community.</p> <p><b>Threatened spp.</b></p> <p>Known</p> <ul style="list-style-type: none"> <li>- <i>Maireana pentagona</i> (Slender Fissure-Plant) (State Rare)</li> </ul> <p>Likely</p> <ul style="list-style-type: none"> <li>- <i>Trichosurus vulpecula</i> (Common Brushtail Possum) (State Rare);</li> <li>- <i>Corcorax melanorhamphos</i> (White-winged Chough) (State Rare);</li> </ul> <p>Possible</p> <ul style="list-style-type: none"> <li>- <i>Falco hypoleucos</i> (Grey Falcon) (nationally Vulnerable, State Rare);</li> <li>- <i>Falco peregrinus macropus</i> (Peregrine Falcon) (State Rare);</li> <li>- <i>Myiagra inquieta</i> (Restless Flycatcher) (State Rare); and</li> <li>- <i>Leipoa ocellata</i> (Malleefowl) (nationally Vulnerable and State Vulnerable);</li> </ul>							



	<ul style="list-style-type: none"> <li>- <i>Polytelis anthopeplus monarchoides</i> (Regent Parrot) (nationally Vulnerable and State Vulnerable);</li> <li>- <i>Philemon citreogularis citreogularis</i> (Little Friarbird) (State Rare).</li> </ul>				
<b>Landscape context score</b>	1.10	<b>Vegetation Condition Score</b>	18.20	<b>Conservation significance score</b>	1.14
<b>Unit biodiversity Score</b>	22.82	<b>Area (ha)</b>	0.080	<b>Total biodiversity Score</b>	1.82

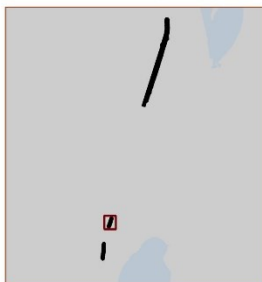
### 4.1.3. Site map showing areas of proposed impact



Figure 2. Native Vegetation Associations proposed to be impacted within Section 1 of the Project Area.



Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)



- Legend**
- Project area (Section 2)
  - BAM site
  - Local road
  - Vegetation Association**
  - B1: *Zygophyllum aurantiacum*  
with *Maireana pentatropis* low open shrubland

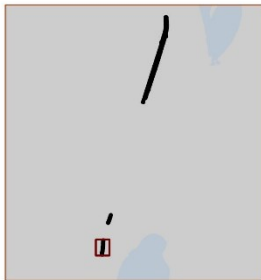


**Figure 3. Native Vegetation Associations proposed to be impacted within Section 2 of the Project Area.**

X:\projects\EBS\_Current\_Projects\Ecology\EX220202\_MurraylandsRoad\Projects\EX220202\_MurraylandsRoad\_20230307\_02.aprx/(E002\_VegetationImpact\_P\_A4\_20220823\_01)



Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)



- Legend**
- Project area (Section 3)
  - BAM site
  - Local road
  - Vegetation Association**
  - C1: *Zygophyllum aurantiacum* with *Maireana brevifolia* low shrubland



**Figure 4. Native Vegetation Associations proposed to be impacted within Section 3 of the Project Area.**

## 4.2. Threatened species assessment

The EPBC Act PMST report identified 21 threatened species and 12 migratory species protected under the EPBC Act, which may be relevant to the Project Area. Table 9 summarises the results of the PMST report and the relevant MNES are discussed further below.

The assessment of likelihood of national and state listed threatened flora and fauna (identified by the PMST) to occur in the Project Area is summarised in Table 10 and Table 11.

Note that some of these matters are not impacted by, or relevant to, the Project (e.g., Fish and listed marine species which are afforded specific protection within Commonwealth marine areas), and these matters are therefore not discussed further.

**Table 9. Summary of the EPBC Act Protected Matters Search Tool results (5 km buffer).**

Matters of National Environment Significance under EPBC Act 1999	Identified within the search area
World Heritage Properties	None
National Heritage Properties	None
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	3
Listed Threatened Species	21 (4 flora and 17 fauna)
Listed Migratory Species	12

### 4.2.1. Matters of National Environmental Significance

There are four matters of National Environmental Significance (MNES) relevant to the Project Area.

- Three listed Threatened Ecological Communities (TEC):
  - Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (Buloke Woodlands) (Endangered).
  - Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregion (Plains Mallee Box) (Critically Endangered).
  - The Mallee Bird Community of the Murray Darling Depression Bioregion (MBC) (Endangered).
- One Wetlands of International importance:
  - The Coorong, and lakes Alexandrina and Albert wetland.

The Buloke Woodlands and Plains mallee box TECs are not present within the Project Area as vegetation associated with these TECs are not present within the Project Area.

The MBC TEC comprises an assemblage of 20 bird species that rely on mallee vegetation for their persistence (DAWE 2021). These 20 bird species are split up into mallee specialists and mallee dependants. An area needs to be located within the Murray Darling Depression IBRA bioregion and/or in specific area where other bioregions intrude the Murray Darling Depression bioregion for the MBC TEC to occur. Native vegetation of at least 10 ha, containing at least 5 ha dominated by mallee also needs to be present. Lastly, at least three of the 20 bird species identified as a part of the TEC need to be recorded in the past 10 years within 20km of the site for the TEC to be present.

The Project Area is connected to a patch of native mallee vegetation that is >5 ha and based on historical records within the last ten years, there have been 11 of the 20 MBC TEC bird species recorded within 20 km of the Project Area. Therefore, the MBC TEC is present in the Project Area, in VA A2. A total of 0.555 ha of VA A2 is proposed to be cleared in the Project Area. This area is small compared to the surrounding landscape and presence of VA A2 (which extends beyond the impacted footprint). The clearance area is linear adjacent to an existing cleared area (the road) and it is unlikely that vegetation clearance will have an impact on the MBC TEC.

The Coorong, and lakes Alexandrina and Albert wetland is not present in the area or adjacent to the Project Area as indicated by the SA vegetation mapping (DEW 2023) and therefore, the Project works are unlikely to impact on this wetland.

#### **4.2.2. Threatened flora**

No nationally listed flora species were identified by the PMST as known or likely to occur in the Project Area.

A BDBSA search identified four State listed flora species, that have records within 5 km of the Project Area, with <1 km reliability (Table 10) (DEW 2022). One of the species was assessed as known / highly likely to occur within the Project Area based on survey effort, recent records and suitable habitat:

- *Maireana pentagona* (Slender Fissure-Plant), State Rare and recorded within the Project Area.

Two additional State listed flora species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- *Callistemon brachyandrus* (Prickly Bottlebrush), State Rare; and
- *Eragrostis lacunaria* (Purple Love-grass), State Rare.

BDBSA flora records located within 5 km of the Project Area are provided in [Appendix 3](#).

**Table 10. Threatened flora species, identified by the PMST and/or BDBSA search in the Project Area (DCCEEW 2023b; DEW 2022).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Brachyscome paludicola</i>	Swamp Daisy		R	2	2012	Found along the Murray River and in the South-east of South Australia, growing on inundated clay soils and common in seasonally wet, red gum dominated flats (SSCC 2018).	Unlikely – no suitable habitat within the Project Area.
<i>Callistemon brachyandrus</i>	Prickly Bottlebrush		R	2	2003	Mostly in the sandy soils of alluvial flats in subarid regions of the Darling and lower Murray River (SSCC 2018).	Possible – may be suitable habitat nearby, recent record within 2km.
<i>Eragrostis lacunaria</i>	Purple Love-grass		R	2	2003	Found in SA near the Murray River in deep red or brown often alluvial loams of medium texture in tablelands and low hilly country; also in skeletal sands on rocky sandstone, quartzite, calcrete and granite breakaways, ridges and hills (SSCC 2018).	Possible – may be suitable habitat nearby, recent record within 2km.
<i>Maireana pentagona</i>	Slender Fissure-Plant		R	3	2022	Found across various habitats, including grasslands and woodlands, often on poorer, heavier soils. Has been previously recorded on floodplains of the Murray River (SSCC 2018).	Known – observed within the Project Area during flora survey.

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** **CE:** Critically Endangered. **EN/E:** Endangered. **VU/V:** Vulnerable. **R:** Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

**1:** PMST (DCCEEW 2023b) – 5 km buffer applied to Project Area;

**2:** BDBSA (DEW 2022) – 5 km buffer applied to Project Area;

**3:** Observed in the Project Area

**Abbreviations within Distribution and preferred habitat:**

**EP:** Eyre Peninsula; **FP:** Fleurieu Peninsula; **FR:** Flinders Ranges; **KI:** Kangaroo Island; **MLR:** Mount Lofty Ranges; **MU:** Murraylands; **NL:** Northern Lofty; **NP:** National Park; **NSW:** New South Wales; **QLD:** Queensland; **SL:** Southern Lofty; **SE:** Southeast / South-Eastern; **SW:** South-Western; **Tas:** Tasmania; **Vic:** Victoria; **WA:** Western Australia; **YP:** Yorke Peninsula.

### 4.2.3. Threatened fauna

The PMST (DCCEE 2023b) identified six nationally listed threatened fauna species as known or likely to occur within 5 km of the Project Area, consisting of five birds and one amphibian. A BDBSA search identified 15 additional State listed threatened fauna species, consisting of 13 birds, one mammal and one reptile that have records within 5 km of the Project Area (Table 11), which did not appear on the PMST (DEW 2022). In total, two threatened fauna species were assessed as likely to occur within the Project Area based on survey effort, suitable habitat and recent records:

- Common Brushtail Possum (*Trichosurus vulpecula*) – State Rare; and
- White-winged Chough (*Corcorax melanorhamphos*), State Rare.

Six additional listed threatened species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:

- Grey Falcon (*Falco hypoleucos*) – nationally Vulnerable and State Rare.
- Little Friarbird (*Philemon citreogularis citreogularis*) – State Rare;
- Malleefowl (*Leipoa ocellata*) – nationally Vulnerable and State Vulnerable;
- Peregrine Falcon (*Falco peregrinus macropus*) – State Rare;
- Regent Parrot (*Polytelis anthopeplus monarchoides*) – nationally Vulnerable and State Vulnerable; and
- Restless Flycatcher (*Myiagra inquieta*) – State Rare.

Grey Falcons frequent 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. This species also occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Schoenjahr 2018). There is suitable habitat within the Project Area for this species, however, as it is not a known breeding location and there is more suitable habitat nearby, it is unlikely to be considered critical habitat for this species.

Malleefowl generally occupy shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine *Callitris* woodlands, acacia shrublands, Broombush *Melaleuca uncinata* vegetation or coastal heathlands (Benshemesh 2007). Although the Project Area contains some mallee, the leaf litter, shrub density and understorey plant species do not provide good habitat for this species, and therefore, clearance of the mallee habitat within the Project Area is unlikely to impact on Malleefowl.

Regent Parrots typically occur in wooded areas that can provide roosting and nesting habitat for Regent Parrots. There are trees with large hollows present within the Project Area which would likely provide important nesting habitat for this species. As such, trees within the Project Area that contain large hollows should be avoided.

BDBSA fauna records located within 5 km of the Project Area are provided in [Appendix 4](#).



**Table 11. Threatened fauna species, identified by the PMST and/or BDBSA search in the Project Area (DCCEEW 2023b; DEW 2022).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<b>AMPHIBIA (AMPHIBIANS)</b>							
<i>Litoria raniformis</i>	Growling Grass Frog	VU	V	1, 2	Known / 2010	Found mostly amongst emergent vegetation, including <i>Typha</i> sp. (bullrush), <i>Phragmites</i> sp. (reeds) and <i>Eleocharis</i> 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; montane eucalypt forest, dry sclerophyll forest; steep-banked water edges (like ditches and drains) and gently graded edges containing fringing plants (Clemann and Gillespie 2012).	<b>Unlikely</b> – despite recent records, there is no aquatic habitat within the Project Area.
<b>AVES (BIRDS)</b>							
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2, 3	2018	Habitat is lakes, rivers, swamps; rarely coastal (Pizzey and Knight 2013).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Biziura lobata menziesi</i>	Musk Duck		R	2	2017	Lakes, reservoirs and wetlands including well-vegetated swamps and fresh and brackish habitats (Pizzey and Knight 2013).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V	2	2010	Endemic to Australia, mainly in the south and inland. Found mainly in saline and hypersaline (very salty) waters of the inland and coast, typically large, open and shallow (Birds in Backyards 2023).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	3	2015	Prefers drier forests, woodlands of <i>Eucalyptus</i> sp., crops and pastures (Pizzey and Knight 2013).	<b>Likely</b> – suitable habitat within the Project Area and recent records within 5km.
<i>Coturnix ypsilophora australis</i>	Brown Quail		V	2	2013	Prefers dense grasslands, often on the edges of open forests, and bracken (Birdlife Australia 2023).	<b>Unlikely</b> – no suitable habitat in the form of dense grasslands in the Project Area.
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	1	Likely	This species is mainly found where annual rainfall is less than 500 mm and 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 (Schoenjahn 2018).	<b>Possible</b> – there is some suitable habitat within the Project Area although no recent records within 5km.
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	3	2000	Found everywhere from woodlands to open grasslands and coastal cliffs – though less frequently in desert regions. This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices (Pizzey and Knight 2013).	<b>Possible</b> – suitable habitat within the Project Area and recent records within 5km.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle		E	3	1999	Widespread over diverse habitats; forest, woodland, open scrub, tree-lined watercourses of interior Australia such as the Murray River. Prefers areas where open country intermixes with wooded or forested hills, as in farmland, irrigated land (Morcombe, 2021).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Leipoa ocellata</i>	Malleefowl	VU	V	1	Likely	In South Australia, the Malleefowl is distributed from the south-east, north to the Murray-Mallee region and west to Streaky Bay, south of 32°S. The species also occurs west of the Eyre Peninsula. Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including eucalypt or native pine Callitris woodlands, acacia shrublands, Broombush Melaleuca uncinata vegetation or coastal heathlands (Benshemesh 2007).	<b>Possible</b> – suitable habitat within the Project Area although no recent records within 5km.
<i>Myiagra inquieta</i>	Restless Flycatcher		R	2	2013	Found throughout northern and eastern mainland Australia, as well as in south-western Australia. The Restless Flycatcher is found in open forests and woodlands and is frequently seen in farmland (Birdlife Australia 2023).	<b>Possible</b> – there is some suitable habitat in the Project Area and recent recorded within 5km.
<i>Oxyura australis</i>	Blue-billed Duck		R	2	2009	Prefers large dams and lakes and well-vegetated freshwater swamps (Pizzey and Knight 2013).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Pedionomus torquatus</i>	Plains-wanderer	CE	E	1	Likely	Plains-wanderers inhabit sparse, treeless, lowland native grasslands which usually occur on hard red-brown clay soils (DEDEW 2016).	<b>Unlikely</b> – no suitable habitat in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Philemon citreogularis citreogularis</i>	Little Friarbird		R	3	1999	Widespread in Western New South Wales and northern Victoria along Murray River, to South Australia. Found near water, mainly in open forests and woodlands dominated by eucalypts. Also found in wetlands, monsoon forests, mangroves and coastal heathlands. Only extend into arid zone along waterways. Mostly tropical, but also common in semi-arid zone. It will also be seen in gardens and orchards (Birds in Backyards 2023).	<b>Possible</b> – On the edge of this species range but some suitable habitat in the Project Area and records within 5km.
<i>Podiceps cristatus australis</i>	Great Crested Grebe		R	2	2010	Found almost exclusively on lakes, larger lagoons and swamps, reservoirs and bays or inlets (Pizzey and Knight 2013).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot	VU	V	1, 2, 3	Likely / 2017	The Regent Parrot (eastern) is confined primarily to the semi-arid interior of south-eastern mainland Australia. It inhabits riparian or littoral River Red Gum ( <i>Eucalyptus camaldulensis</i> ) forests or woodlands and adjacent Black Box ( <i>E. largiflorens</i> ) woodlands (Baker-Gabb and Hurley 2011).	<b>Possible</b> – some suitable habitat in the Project Area and recent records within 5km.
<i>Rostratula australis</i>	Australian Painted Snipe	EN	E	1	Likely	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 (Morcombe 2021).	<b>Unlikely</b> – No suitable habitat in the Project Area.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Spatula rhynchotis</i>	Australasian Shoveler		R	2, 3	2014	Prefers fresh and saline lakes and well-vegetated freshwater wetlands. Also occurs in coastal inlets, floodwaters and sewage ponds (Morcombe 2021).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Stictonetta naevosa</i>	Freckled Duck		V	2	2009	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds (Pizzey and Knight 2013).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<b>MAMMALIA (MAMMALS)</b>							
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2	2004	Utilises various woodland habitats and suburban environs. Feeds on flowers, fruit, buds and leaves of native vegetation. Requires hollows (within dead or alive tree) or on ground for daytime nesting (Strahan & van Dyck 2008).	<b>Likely</b> – Suitable habitat (hollow bearing trees) in the Project Area and recent records within 2km.
<b>REPTILIA (REPTILES)</b>							
<i>Morelia spilota</i>	Carpet Python		R	2	2007	Prefers riparian vegetation groups, and dry sclerophyll forest with ground cover and logs. Lives in hollows of large River Red Gums and north-facing cliffs along the Murray River (DEH 2008).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

**1: PMST (DCCEEW 2023b) – 5 km buffer applied to Project Area;**

**2: BDBSA (DEW 2022) – 5 km buffer applied to Project Area;**

**3: Birdlife Australia (DEW 2022) – 5 km buffer applied to Project Area.**

**Abbreviations within Distribution and preferred habitat:**

**EP: Eyre Peninsula; FP: Fleurieu Peninsula; FR: Flinders Ranges; KI: Kangaroo Island; MLR: Mount Lofty Ranges; MU: Murraylands; NL: Northern Lofty; NP: National Park; NSW: New South Wales  
QLD: Queensland; SL: Southern Lofty; SE: Southeast / South-Eastern; SW: South-Western; Tas: Tasmania; Vic: Victoria; WA: Western Australia; YP: Yorke Peninsula.**

#### 4.2.4. Migratory fauna

The PMST (DCCEEW 2022b) identified six nationally listed migratory species as known or likely to occur within 5 km of the Project Area (Table 12). No migratory species were assessed as potentially occurring within the Project Area based on survey effort, recent records and suitable habitat. While the Murray River, which is nearby, may provide some suitable habitat there is no water sources in the Project Area itself and these species are unlikely to occur.

**Table 12. Migratory fauna species, identified by the PMST and/or BDBSA search in the Project Area (DCCEEW 2023b; DEW 2022).**

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi (W)	R	1	Known	Varied coastal and interior wetlands: narrow muddy edges of billabongs, river pools, mangroves, among rocks reefs and rocky beaches (Morcombe 2021).	<b>Unlikely</b> – while there is suitable habitat nearby (Murray River), there are no water sources or suitable habitat in the Project Area.
<i>Apus pacificus</i>	Fork-tailed Swift	Mi (Ma)		1	Likely	Migratory and widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats (Birdlife Australia 2023).	<b>Unlikely</b> – no suitable habitat within the Project Area, although may occur as flyover only.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi (W)		1	Known	Prefers tidal mudflats, saltmarshes and shallow, fresh or saline inland wetlands (Pizzey and Knight 2013)	<b>Unlikely</b> – some suitable habitat nearby but no recent records within 5km.
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi (W)	R	1	Known	Inhabits shallow fresh waters often associated with low grass and other vegetation. Occasionally seen in salt marshes and tidal areas. (Pizzey and Knight 2013).	<b>Unlikely</b> – some suitable habitat nearby but no recent records within 5km.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi (T)	E	1	Known	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season (Morcombe 2021).	<b>Unlikely</b> – some suitable habitat nearby but no recent records within 5km.

Scientific name	Common name	Conservation status		Source	PMST result / Latest sighting (year)	Distribution and habitat preferences	Likelihood of occurrence within the Project Area
		Aus	SA				
<i>Pandion haliaetus</i>	Osprey	Mi (W)		1	Likely	Prefers coastal and terrestrial wetlands and require a range of habitats from coastal cliffs, estuaries, mangroves and large lakes for foraging (DCCEEW 2023c).	<b>Unlikely</b> – some suitable habitat nearby but no recent records within 5km.

**Conservation status:**

**Aus:** Australia (EPBC Act). **SA:** South Australia (NPW Act). **Conservation Codes:** CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. **ssp.:** the conservation status applies at the sub-species level. **Mi:** listed as migratory under the EPBC Act. **Mi (W):** listed as a Migratory Wetland species under the EPBC Act. **Mi (Ma):** listed as a Migratory Marine species under the EPBC Act.

**PMST result:** Likelihood of species or species habitat to occur within 5 km of the Project Area.

**Source of Information:**

**1:** PMST (DCCEEW 2023b) – 5 km buffer applied to Project Area;

**2:** BDBSA (DEW 2022) – 5 km buffer applied to Project Area;

**3:** Birdlife Australia (DEW 2022) – 5 km buffer applied to Project Area.

**Abbreviations within Distribution and preferred habitat:**

**EP:** Eyre Peninsula; **FP:** Fleurieu Peninsula; **FR:** Flinders Ranges; **KI:** Kangaroo Island; **MLR:** Mount Lofty Ranges; **MU:** Murraylands; **NL:** Northern Lofty; **NP:** National Park; **NSW:** New South Wales  
**QLD:** Queensland; **SL:** Southern Lofty; **SE:** Southeast / South-Eastern; **SW:** South-Western; **Tas:** Tasmania; **Vic:** Victoria; **WA:** Western Australia; **YP:** Yorke Peninsula.



### 4.3. 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.

This vegetation clearance is part of 3 sections of road realignment proposed along Murraylands Road. Section 1 of the road realignment consists of approximately 1.36 km of vegetation clearance on one side of the road, with sections 2 and 3 consisting of verge widening of 3 m on one side of the road. Vegetation being impacted includes chenopod shrublands, *Eucalyptus oleosa* and *Eucalyptus gracilis* mallee vegetation over low open shrubland.

All works fall within the Project Area.

The direct impact of the Project is the removal of 2.450 ha of native vegetation consisting of:

- 0.885 ha of A1a: *Zygophyllum aurantiacum* +/- with *Lycium australe* with emergent *Acacia nyssophylla* and *Myoporum platycarpum* open shrubland;
- 0.885 ha of A1b: *Sclerolaena patenticuspis* +/- *Oxalis perennans* with *Rytidosperma* sp. very low open shrubland;
- 0.555 ha of A2: *Eucalyptus oleosa* open mallee woodland over *Zygophyllum aurantiacum* with *Maireana pentatropis* low shrubland;
- 0.046 ha of B1: *Zygophyllum aurantiacum* with *Maireana pentatropis* low open shrubland; and
- 0.080 ha of C1: *Zygophyllum aurantiacum* with *Maireana brevifolia* low shrubland.

Potential indirect impacts of the Project include:

- Dust generation, which may impact surrounding vegetation;
- Noise generation, which may impact fauna species in the area; and

There may be potential impacts on the root zone of vegetation, depending on the level of impact to the vegetation.

### 4.4. 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 NPW Act.

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

As the road realignment needs to adjoin as a continuation of the existing road, construction is required next to the existing Murraylands Road at the curves. Section 1 of the road realignment is within an area which consists of less intact native vegetation. Sections 2 and 3 will consist of verge widening to lessen the apex of their respective road curves. As complete native vegetation avoidance is not possible and alternative alignments beyond the road corridor without vegetation are not available the project needed to focus on measures to minimise the impacts as discussed in section (b) Minimization below.

The project sought to initially identify and minimise vegetation impacts by avoiding as many scattered trees as possible in Section 1 of the road realignment.

The area of Section 1 consists of several scattered *Eucalyptus gracilis* and *Eucalyptus oleosa* trees, which will be avoided as much as possible.

Laka and members from the Mid Murray Council attended the site in early February 2023 to review preliminary designs and implemented a plan to avoid large remnant scattered trees, particularly those with hollows which provide habitat for fauna. Four large remnant trees containing hollows of various sizes which were initially highlighted in the field survey, will be avoided.

- 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 vegetation proposed for removal is the minimum possible to allow for the road realignment as it is limited by safety restrictions and road construction requirements. The pruning of trees rather than the complete removal of trees where applicable will be preferred by the client.

The Project intends to use batters which will be flattened to allow for a reduction in clearance distance where trees are adjacent to the newly proposed road in the northern part of section 1. Furthermore, where applicable, swales alongside the proposed road will be cut in, in order to minimise impact on existing tree roots.

- 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 road realignment 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.*

Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised will be offset by implementing an SEB that outweighs that impact (see Section 6).

## 4.5. 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 13. Assessment against the Principles of Clearance.**

Principle of clearance	Considerations
<p><b>Principle 1(b) – significance as a habitat for wildlife</b></p>	<p><u>Relevant information</u></p> <p>A total of 13 native bird species were recorded using the vegetation during the current fauna assessment (see <u>Appendix 2</u>).</p> <p>No species listed as threatened under the EPBC Act or NPW Act were recorded during the fauna assessment.</p> <p>Two State threatened fauna species were assessed as likely to occur within the Project Area based on survey effort, suitable habitat and recent records:</p> <ul style="list-style-type: none"> <li>• Common Brushtail Possum (<i>Trichosurus vulpecula</i>) – State Rare; and</li> <li>• White-winged Chough (<i>Corcorax melanorhamphos</i>), State Rare.</li> </ul> <p>Six additional nationally and/or State listed threatened fauna species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:</p> <ul style="list-style-type: none"> <li>• Grey Falcon (<i>Falco hypoleucos</i>) – nationally Vulnerable and State Rare.</li> <li>• Little Friarbird (<i>Philemon citreogularis citreogularis</i>) – State Rare;</li> <li>• Malleefowl (<i>Leipoa ocellata</i>) – nationally Vulnerable and State Vulnerable;</li> <li>• Peregrine Falcon (<i>Falco peregrinus macropus</i>) – State Rare;</li> <li>• Regent Parrot (<i>Polytelis anthoepus monarchoides</i>) – nationally Vulnerable and State Vulnerable; and</li> <li>• Restless Flycatcher (<i>Myiagra inquieta</i>) – State Rare.</li> </ul> <p>As there are some scattered trees with hollows located within the Project Area, these may provide nesting habitat for: Common Brushtail Possum and the Regent Parrot and roosting habitat for Grey Falcon and Peregrine Falcon.</p> <p>The area surrounding the Project Area consists of agricultural land. Although there are species identified in the desktop search that use shrublands, this vegetation is unlikely to provide a corridor for movements or a habitat refuge.</p> <p>Vegetation Associations Threatened Fauna Score – 0.1 (All VAs)</p>

Principle of clearance	Considerations
	Unit biodiversity Score A1a – 49.90 A1b – 21.37 A2 – 84.71 B1 – 24.68 C1 – 22.82
	<u>Assessment against the principles</u>  <u>Seriously at Variance</u> Vegetation Associations A1a, A1b, A2, B1 and C1
	<u>Moderating factors that may be considered by the NVC</u>  <p>A total of eight nationally and/or State listed threatened fauna species were assessed as likely or possible to occur within the Project Area.</p> <p>Grey Falcons frequent timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. There is suitable habitat within the Project Area for this species, however, as it is not a known breeding location and there is more suitable habitat nearby, it is unlikely to be considered critical habitat for this species.</p> <p>Malleefowl generally occupy shrublands and low woodlands that are dominated by mallee vegetation. Although the Project Area contains some mallee, the leaf litter, shrub density and understorey plant species do not provide good habitat for this species, and therefore, clearance of the mallee habitat within the Project Area is unlikely to impact on Malleefowl.</p> <p>There are trees with large hollows present within the Project Area which would likely provide important nesting habitat for Regent Parrots and Common Brushtail Possums. Where possible, trees with large hollows have been avoided.</p> <p>Of the other species listed as potentially occurring within the Project Area, due to the thin, linear nature of the proposed clearance adjacent to an already linear clearance (the road) these species are unlikely to be adversely impacted by the proposed works.</p> <p>As such, clearance associated with the Project will not lead to a long-term decrease in the size of a population, reduce the area of occupancy, nor lead to fragmentation of existing populations of these species. The habitat is not considered to be critical to the survival of threatened fauna species and clearance is unlikely to lead to a decline in species or interfere with the recovery of any species. No introduced fauna species are present within the Project Area, however, the clearance of native vegetation is unlikely to introduce invasive fauna species into the Project Area.</p> <p><u>Common species</u></p> <p>All species recorded in the Project Area are species that are commonly found in mallee vegetation. This habitat is widespread throughout the surrounding landscape.</p>

Principle of clearance	Considerations
<b>Principle 1(c)</b> <b>– plants of a rare, vulnerable or endangered species</b>	<p><u>Relevant information</u></p> <p>One State listed threatened species was recorded within the Project Area across VAs A1a, A1b and C1:</p> <ul style="list-style-type: none"> <li>• <i>Maireana pentagona</i> (Slender-Fissure Plant), State Rare.</li> </ul> <p>Two additional State listed flora species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat:</p> <ul style="list-style-type: none"> <li>• <i>Callistemon brachyandrus</i> (Prickly Bottlebrush), State Rare; and</li> <li>• <i>Eragrostis lacunaria</i> (Purple Love-grass), State Rare.</li> </ul> <p>34 native plant species and 12 introduced plant species were observed within the Project Area (see <u>Appendix 1</u>).</p> <p>Threatened Flora Score(s) –</p> <p>A1a – 0.04  A1b – 0.04  A2 – 0  B1 – 0  C1 – 0.04</p>
	<p><u>Assessment against the principles</u></p> <p><u>Seriously at Variance</u>  N/A</p> <p><u>At Variance</u>  A1a, A1b &amp; C1</p>
	<p><u>Moderating factors that may be considered by the NVC</u></p> <p>One State listed threatened species was recorded within the Project Area and two additional State listed flora species were assessed as possible to occur within the Project Area based on survey effort, recent records and suitable habitat.</p> <p><i>Maireana pentagona</i> (Slender-Fissure Plant) was scattered but widespread in the Project Area, particularly in VA A1a and C1. Given the abundance of the species at the site and outside of the proposed clearance area the clearance of 2.450 ha in the Project Area is unlikely to lead to a long-term decrease in the size of a population, reduce the area of occupancy of this species or other threatened species, nor lead to fragmentation of existing populations of threatened species in the Project Area. Additionally the clearance is unlikely to lead to a decline in species or interfere with the recovery of any species due to its abundance at the site.</p> <p>Introduced flora species are present within the Project Area. Clearance of native vegetation is unlikely to introduce more introduced flora species into the Project Area.</p>
<b>Principle 1(d)</b> <b>– the vegetation</b>	<p><u>Relevant information</u></p> <p>Three listed TECs were identified by the PMST as potentially occurring within the Project Area:</p>

Principle of clearance	Considerations
<p><b>comprises the whole or part of a plant community that is Rare, Vulnerable or endangered</b></p>	<ul style="list-style-type: none"> <li>• Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (Buloke Woodlands) (Endangered).</li> <li>• Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregion (Plains Mallee Box) (Critically Endangered).</li> <li>• The Mallee Bird Community of the Murray Darling Depression Bioregion (MBC) (Endangered).</li> </ul> <p>The MBC is present within the Project Area in VA A2. A total of 0.555 ha of VA A2 is proposed to be cleared within this Threatened Ecological Community.</p> <p>Threatened Community Score – 1.4</p>
	<p><u>Assessment against the principles</u></p> <p><u>Seriously at Variance</u> A2</p>
	<p><u>Moderating factors that may be considered by the NVC</u></p> <p>The MBC is listed as Endangered under the EPBC Act and is present within the Project Area in VA A2. VA A2 extends beyond the area of impact and is part of a much larger area which also meets the requirements to be classified as the MBC, clearance is unlikely to lead to a long-term adverse effect on the plant community or reduce its extent. Given clearance in this VA is narrow and adjacent to an existing road, fragmentation of the community’s presence in this area is unlikely, nor will it adversely affect habitat that is critical to its survival, modify or destroy abiotic factors necessary for the community’s survival or interfere with the recovery of the MBC. Invasive flora species are already present in small numbers in this VA and in the greater landscape, but clearance is unlikely to introduce more invasive flora species.</p>
	<p><u>Area of impact</u></p> <p>Clearance of VA A2 is small in relation to the surrounding area in which the MBC also occurs. Mallee vegetation exists in vast areas, particular to the west, surrounding the proposed clearance area.</p>

## 4.6. Risk assessment

The level of risk associated with the application

Table 14. Summary of the level of risk associated with the application.

<b>Total clearance</b>	No. of trees	-
	Area (ha)	2.450
	Total biodiversity Score	113.00
<b>Seriously at variance with principle 1(b), 1(c) or 1 (d)</b>		1 (b) & 1 (d)
<b>Risk assessment outcome</b>		Level 4

# 5. Clearance summary

**Clearance Area(s) Summary table**

Block	Site	Species diversity score	Threatened Ecological	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1a	26	1	0.04	0.1	49.90	0.885	44.14	1			46.34	\$12,002.25	\$660.12
A	1b	18	1	0.04	0.1	21.37	0.885	18.91	1			19.85	\$5,160.83	\$283.85
A	2	26	1.4	0	0.1	84.71	0.555	46.98	1			49.33	\$12,776.68	\$702.72
B	1	14	1	0	0.1	24.68	0.046	1.15	1			1.20	\$305.99	\$16.83
C	1	20	1	0.04	0.1	22.82	0.080	1.82	1			1.92	\$486.84	\$26.78
						<b>Total</b>	<b>2.450</b>	<b>113.00</b>				<b>118.64</b>	<b>\$30,732.59</b>	<b>\$1,690.30</b>

**Totals summary table**

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
<b>Application</b>	113.00	118.64	\$30,732.59	\$1,690.30	\$32,422.89

<b>Economies of Scale Factor</b>	0.35
<b>Rainfall (mm)</b>	266 (A1a), 267 (A1b), 266 (A2), 261 (B1), 261 (C1)



# 6. 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:

Laka proposes to achieve the SEB by paying into the Native Vegetation Fund. The total SEB payment required for the clearance of **2.450 ha** of native vegetation is **\$32,422.89** which includes an administration fee of **\$1,690.30**.

# 7. References

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# 8. Appendices

## Appendix 1. Flora species recorded during the field survey.

*	Scientific name	Common name	Conservation status	
			Aus	SA
	<i>Acacia ligulata</i>	Umbrella Bush		
	<i>Acacia nyssophylla</i>	Spine Bush		
*	<i>Asphodelus fistulosus</i>	Onion Weed		
	<i>Atriplex vesicaria</i>	Bladder Saltbush		
*	<i>Brassica sp.</i>			
*	<i>Carrichtera annua</i>	Ward's Weed		
*	<i>Carthamus lanatus</i>	Saffron Thistle		
	<i>Dissocarpus paradoxus</i>	Ball Bindyi		
	<i>Ehrharta sp.</i>	Veldt Grass		
	<i>Einadia nutans ssp.</i>	Climbing Saltbush		
	<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush		
*	<i>Erodium botrys</i>	Long Heron's-bill		
*	<i>Erodium sp.</i>	Heron's-bill/Crowfoot		
	<i>Eucalyptus gracilis</i>	Yorrell		
	<i>Eucalyptus oleosa ssp.</i>			
*	<i>Geranium sp.</i>	Geranium		
*	<i>Hypochaeris sp.</i>	Cat's Ear		
	<i>Iseilema sp.</i>	Flinder's-grass		
	<i>Lycium australe</i>	Australian Boxthorn		
	<i>Maireana brevifolia</i>	Short-leaf Bluebush		
	<i>Maireana pentagona</i>	Slender Fissure-plant		R
	<i>Maireana pentatropis</i>	Erect Mallee Bluebush		
	<i>Maireana sedifolia</i>	Bluebush		
	<i>Maireana sp.</i>	Bluebush/Fissure-plant		
*	<i>Marrubium vulgare</i>	Horehound		
	<i>Mesembryanthemum crystallinum</i>	Common Iceplant		
	<i>Myoporum platycarpum ssp.</i>	False Sandalwood		
	<i>Oxalis perennans</i>	Native Sorrel		
*	<i>Oxalis pes-caprae</i>	Soursob		
	<i>Ptilotus spathulatus</i>	Pussy-tails		
	<i>Rhagodia candolleana ssp.</i>	Sea-berry Saltbush		
	<i>Rhagodia parabolica</i>	Mealy Saltbush		
*	<i>Romulea rosea var. australis</i>	Common Onion-grass		
	<i>Rytidosperma sp.</i>	Wallaby-grass		
*	<i>Salvia verbenaca var.</i>	Wild Sage		
	<i>Sclerolaena diacantha</i>	Grey Bindyi		

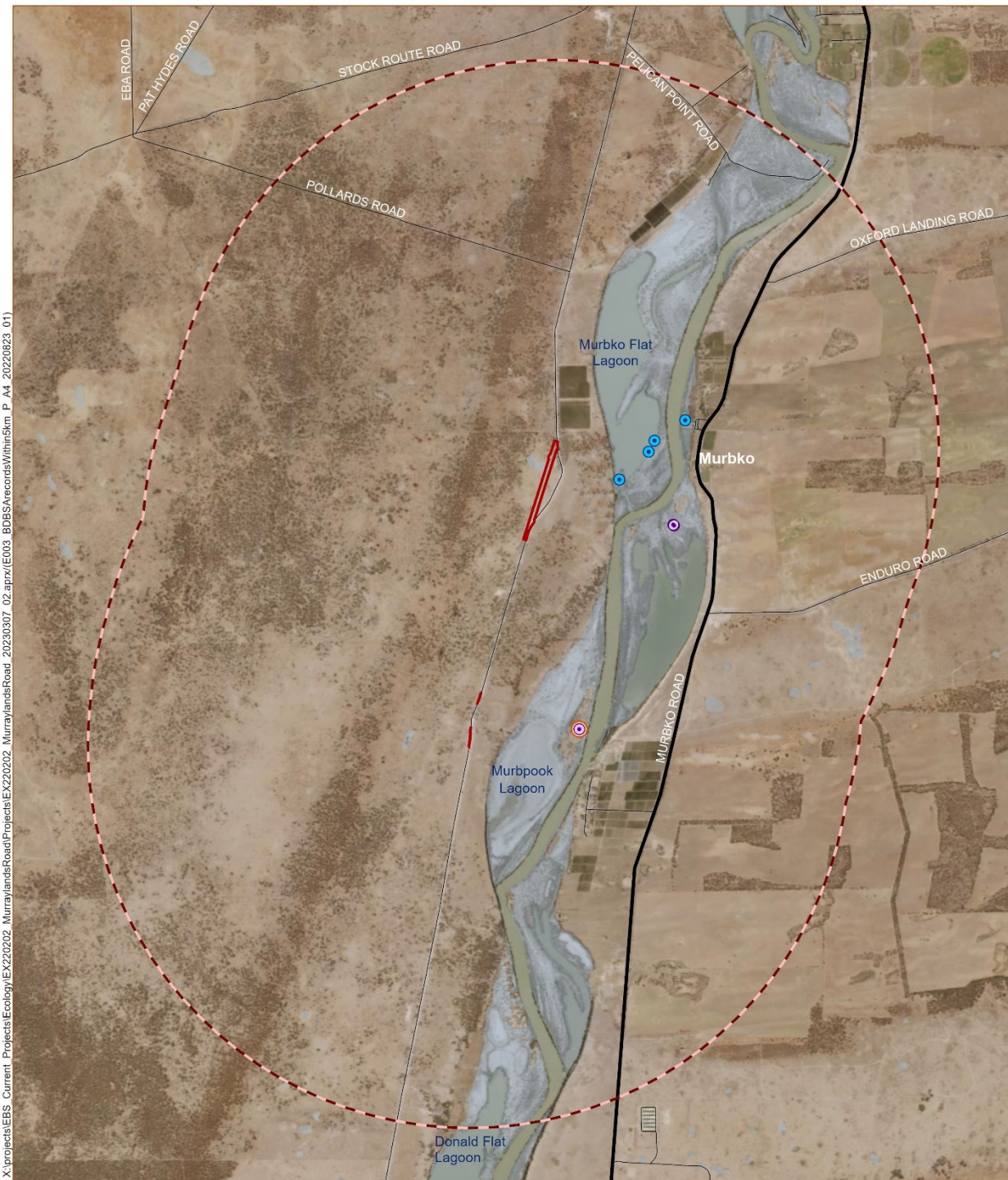
*	Scientific name	Common name	Conservation status	
			Aus	SA
	<i>Sclerolaena patenticuspis</i>	Spear-fruit Bindyi		
	<i>Sclerolaena sp.</i>	Bindyi		
	<i>Tetragonia sp.</i>	False Spinach		
	<i>Tetragonia tetragonoides</i>	New Zealand Spinach		
	<i>Teucrium sp.</i>	Germander		
	<i>Vittadinia sp.</i>	New Holland Daisy		
	<i>Wurmbea dioica ssp.</i>	Early Nancy		
	<i>Zygophyllaceae sp.</i>	Twinleaf Family		
	<i>Zygophyllum aurantiacum</i>	Shrubby Twinleaf		

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. \*: Introduced.

**Appendix 2. Fauna species recorded during the field survey.**

Scientific name	Common name
<i>Accipiter fasciatus</i>	Brown Goshawk
<i>Aphelocephala leucopsis</i>	Southern Whiteface
<i>Aquila audax</i>	Wedge-Tailed Eagle
<i>Barnardius zonarius</i>	Australian Ringneck
<i>Cacatua galerita</i>	Sulphur-Crested Cockatoo
<i>Corvus coronoides</i>	Australian Raven
<i>Dromaius novaehollandiae</i>	Emu
<i>Gavicalis virescens</i>	Singing Honeyeater
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Haliastur sphenurus</i>	Whistling Kite
<i>Macropodidae sp.</i>	Kangaroos
<i>Malurus leucopterus</i>	White-Winged Fairywren
<i>Smicromnis brevirostris</i>	Weebill
<i>Taeniopygia guttata castanotis</i>	Zebra Finch

### Appendix 3. BDBSA flora record located within 5 km of the Project Area

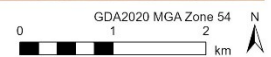


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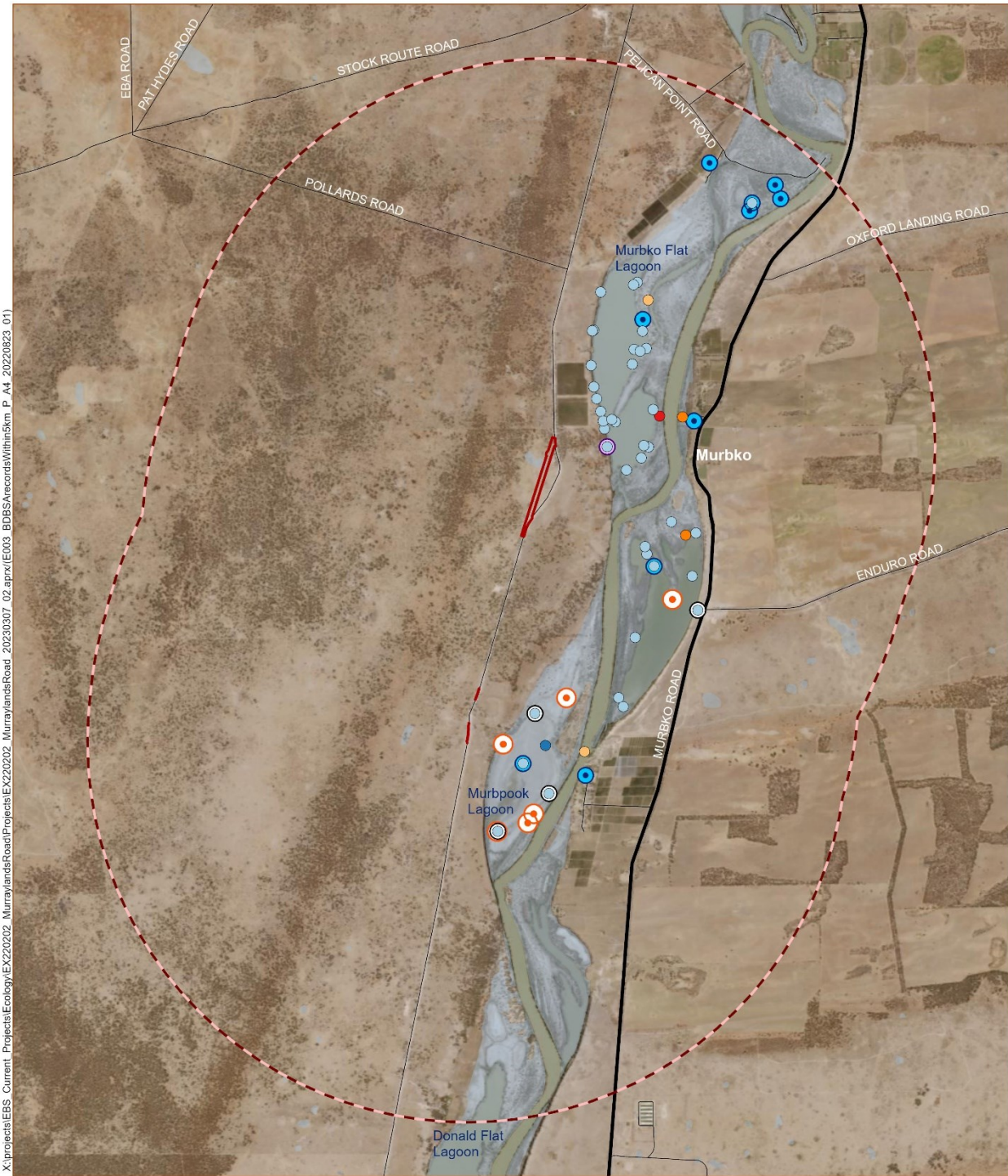
Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)

- Legend**
- Project area
  - Buffer (5 km)
  - Main road
  - Local road
  - Water body

- Threatened flora**
- *Brachyscome paludicola* (Swamp Daisy) SA: R\*
  - *Callistemon brachyandrus* (Prickly Bottlebrush) SA: R
  - *Eragrostis lacunaria* (Purple Love-grass) SA: R



**Appendix 4. BDBSA fauna record located within 5 km of the Project Area.**



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Data Source: EBS Ecology (2022), ESRI (2022), DEW (2021), DIT (2021), LAKA (2022)

- |  |  |
|--|--|
| <b>Legend</b>  |  |
| Project area   | Banded Stilt ( <i>Cladorhynchus leucocephalus</i> ) SA: V                  |
| Buffer (5 km)  | Blue-billed Duck ( <i>Oxyura australis</i> ) SA: V                         |
| Main road  | Brown Quail ( <i>Coturnix ypsilophora australis</i> ) SA: V                |
| Local road   | Carpet Python ( <i>Morelia spilota</i> ) SA: R                             |
| Water body   | Common Brushtail Possum ( <i>Trichosurus vulpecula</i> ) SA: R             |
| <b>Threatened fauna</b>  |  |
| Australasian Darter ( <i>Anhinga novaehollandiae novaehollandiae</i> ) SA: R | Great Crested Grebe ( <i>Podiceps cristatus australis</i> ) SA: R          |
| Australasian Shoveler ( <i>Spatula rhynchotis</i> ) SA: R                    | Musk Duck ( <i>Biziura lobata menziesi</i> ) SA: R                         |
|  | Regent Parrot ( <i>Polytelis anthopeplus monarchoides</i> ) SA: V, AUS: VU |
|  | Restless Flycatcher ( <i>Myiagra inquieta</i> ) SA: R                      |
|  | Southern Bell Frog ( <i>Litoria raniformis</i> ) SA: V, AUS: VU            |
|  | Freckled Duck ( <i>Stictonetta naevosa</i> ) SA: V                         |







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