Native Vegetation Clearance

Robe Industrial Land Division

Data Report

Clearance under Section 28 of the Native Vegetation Act 1991

21 February 2022

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

Native Vegetation Clearance Robe Industrial Land Division Data Report

21/02/2022

Version 2

Prepared by EBS Ecology for Barry Bowyer

Document Control					
Revision No.	**Date issued**	**Authors**	**Reviewed by**	**Date Reviewed**	**Revision type**
1	27/09/2021	H. Merigot (NVC Accredited Consultant)	Chris Gibson	29/09/2021	Draft
2	21/02/2022	H. Merigot	-	-	Final

Distribution of Copies			
Revision No.	**Date issued**	**Media**	**Issued to**
1	29/09/2021	Electronic	Barry Bowyer
2	21/02/2022	Electronic	Barry Bowyer

EBS Ecology Project Number: EX210202

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CITATION: EBS Ecology (2021) Native Vegetation Clearance Robe Industrial land division Data Report. Report to Barry Bowyer. EBS Ecology, Adelaide.

Cover photograph: Vegetation within the Project Area.

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Glossary and abbreviations

BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia (maintained by DEW)
DAWE	Department of Agriculture, Water and the Environment (Commonwealth)
DEW	Department for Environment and Water (South Australia)
EBS	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
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	Industrial Subdivision, Robe
Project Area	Property on Davenport Road, Robe.
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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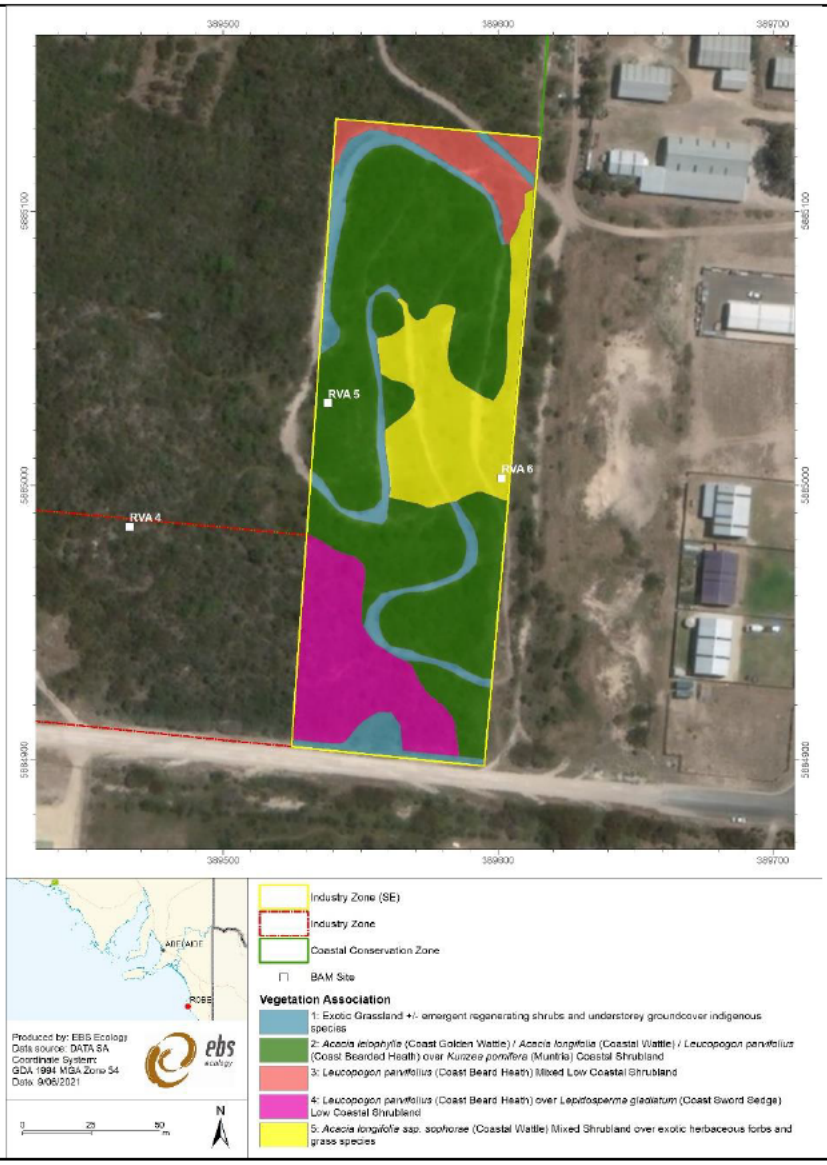
1. Application information

Table 1. Application details.

Applicant:	Barry Bowyer		
Key contact:	Barry Bowyer [redacted]		
Landowner:	Barry Bowyer		
Site Address:	Davenport Road, Robe		
Local Government Area:	Robe	**Hundred:**	Waterhouse
Title ID:	CT 6054 928	**Parcel ID**	D82834 A2001

Table 2. Summary of the proposed clearance.

Purpose of clearance:	Clearance required for the subdivision of land for industrial purposes.
Description of the vegetation under application:	A1: 0.178 ha of Exotic grassland with emergent regenerating shrubs; A2: 0.868 ha of *Acacia leiophylla*, *Acacia longifolia* and *Leucopogon parvifolius* coastal shrubland; A3: 0.094 ha of *Leucopogon parvifolius* mixed low coastal shrubland; A4: 0.244 ha of *Leucopogon parvifolius* over *Lepidosperma gladiatum* low coastal shrubland; and A5: 0.275 ha of *Acacia longifolia ssp. sophorae* mixed shrubland.
Total proposed clearance – area (ha) and/or number of trees:	1.659 ha of native vegetation.
Level of clearance:	Level 4
Overlay (Planning and Design Code):	Native Vegetation Overlay

Map of proposed clearance area: (show as a minimum; property boundary and proposed clearance area)	
Seriously at variance with the Principles of clearance?	1(b)
Substantially intact	No, high presence of weeds through all stratum and recent human caused disturbance in most Vegetation Associations.
Mitigation Hierarchy:	***Avoidance*** **-** The development reasonably requires maximum utilisation of the block for industrial development. Within the block of land, areas of higher quality vegetation have been avoided and the proposed clearance is in the area of poorer quality vegetation. ***Minimization*** **-** At this stage, the remainder of the vegetation within the parcel of land owned by Barry Bowyer will be retained. ***Rehabilitation or restoration*** **-** No rehabilitation or restoration works are proposed as part of this clearance application. ***Offset*** **–** The adverse impacts to native vegetation that cannot be avoided or minimised will be offset through the achievement of a SEB that outweighs the proposed impact.
SEB Offset proposal	Payment of $74,637.62 which includes an administration fee of $3,891.05 (including GST).

2. Purpose of clearance

2.1. Description

EBS Ecology (EBS) was engaged by Barry Bowyer to undertake a flora and fauna assessment for the industrial subdivision of the land. The Project involves the clearance of 1.659 ha of coastal shrubland vegetation.

Objectives

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

The report presents findings of the desktop assessment; in addition to results of the BAM required for assessing trees proposed for clearance under the Native Vegetation Act.

2.2. Background

Current and surrounding land use

The Project Area consists of coastal shrubland, low coastal shrubland and exotic grassland with emergent native species. More broadly, the Project Area backs onto residential and industrial land to the east and areas to the west and south consist of largely intact land zoned for conservation.

Administrative Boundaries

The Project Area occurs within the Robe District Council, the Limestone Coast Landscape Management Region, Hundred of Waterhouse and Robe County.

Bioregions

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

Approximately 14% (63,931 ha) of the Bridgewater IBRA Subregion and approximately 43% (12,035 ha) of the Beachport IBRA Environmental Association is mapped as remnant vegetation. Of this, 43% (27,527 ha) and 63% (7,626 ha) is formerly conserved and protected, respectively.

2.3. General location map

Figure 1. Site location (Davenport Street, Robe), and landscape context

2.4. Details of the proposal

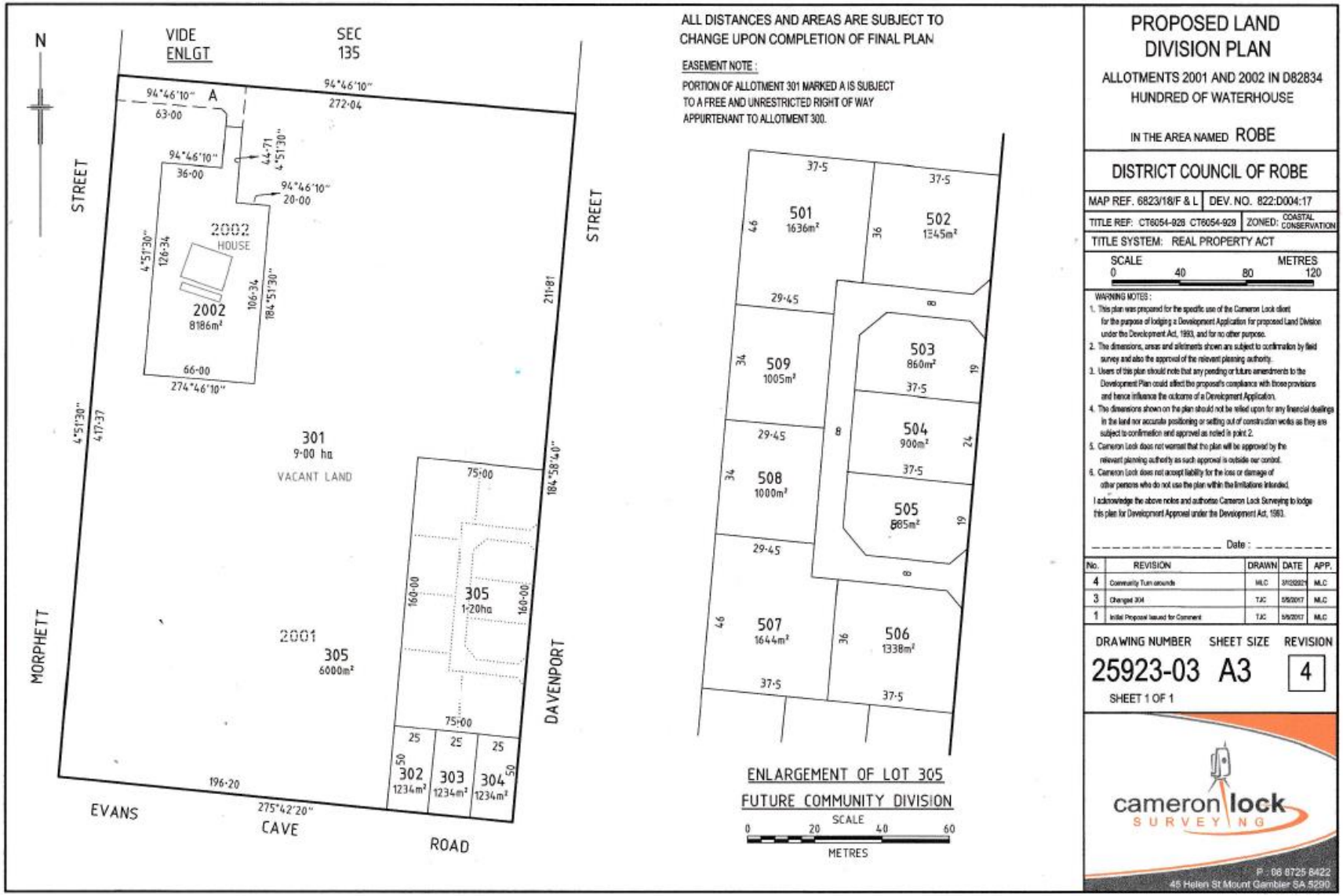


Figure 2. Map showing plan of proposed land division.

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

Environment Protection and Biodiversity Conservation Act 1999 – No approval required.

Native Vegetation Act 1991 – No previous approvals associated with this project.

National Parks and Wildlife Act 1972 – EBS has the required flora collection permit (K25613-20).

Landscape South Australia Act 2019 – A Water Affecting Activity Permit is not required for this Project; A permit to transport declared weeds on a public road is not required for this Project.

Planning, Development and Infrastructure Act 2016 – Development Approval is required for this Project and has not yet been obtained.

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

2.6. Development Application information (if applicable)

Development approval is currently being sought for this Project.

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 14th September 2021 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (DAWE 2021). 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.

3.1.2. BDBSA data extract

A data extract from the Biological Database of South Australia (BDBSA) was obtained from NatureMaps, and further substituted by DEW for more accurate mapping of threatened species to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 14th September 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.

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 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.

3.2. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant Andrew Sinel on 17/01/2019 in accordance with the Bushland Assessment Method (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.* 2007, 2008a, 2008b, 2009; Milne and Croft 2012; Milne and McCallum 2012). The BAM is used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

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

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with BDBSA records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM 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 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.

4. Assessment outcomes

4.1. Vegetation assessment

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

Field survey was conducted on the 17th January 2019. The area was traversed on foot with vegetation assessment sites undertaken based on changes in condition or overstorey structure. The entire block was a *Leucopogon parvifolius* (Coast Beard Heath) dominant community; however, the structures were assessed separately, largely as a result of either:

(a) The historical disturbance – Sections of the block have had disturbance in the form of motor cross tracks, visible on the aerial imagery adjacent to both Davenport Street and Evans Cave Road. Other disturbances such as Illegal rubbish dumping, including plant material have also occurred; or

(b) The topography of the landscape – Dependent on the aspect and elevation of the landscape the vegetation grew denser or lighter. Westerly facing slopes and rises were far more open and had higher sedge cover than the eastern facing slopes and depressions.

There were five vegetation associations observed within the Project area during the field survey. These varied largely in the overstorey cover and are summarised in Table 4 below. The vegetation associations, locations of the associations and the Bushland Assessment Sites (RVA005 & RVA006) are shown below in Figure 3.

Table 4. Description of the vegetation associations present within the Project area.

Association	Description
1	Exotic Grassland +/- emergent regenerating shrubs and understorey groundcover indigenous species
2	*Acacia leiophylla* (Coast Golden Wattle) / *Acacia longifolia* (Coastal Wattle) / *Leucopogon parvifolius* (Coast Beard-heath) over *Kunzea pomifera* (Muntries) Coastal Shrubland
3	*Leucopogon parvifolius* (Coast Beard-heath) Mixed Low Coastal Shrubland
4	*Leucopogon parvifolius* (Coast Beard-heath) over *Lepidosperma gladiatum* (Coast Sword Sedge) Low Coastal Shrubland
5	*Acacia longifolia* ssp. *sophorae* (Coastal Wattle) Mixed Shrubland over exotic herbaceous forbs and grass species

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

Table 5. Summary of VA1.

Vegetation Association	A1: Exotic grassland with +/- emergent regenerating shrubs and understorey groundcover indigenous species.				
					
General description	A highly degraded exotic grassland with some low level regeneration and ground cover mat plants remnant from disturbance. The site had high levels of historical illegal rubbish dumping and motorcycle tracks. The site was slowly regenerating; however, high cover of Buffalo Grass will mean that full recovery not likely without intervention.				
Threatened species or community	No Threatened Ecological Communities were present in the Project Area Several flora and fauna species listed under the EPBC and/or NPW Act were determined as likely or possible to occur in the Project Area. **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E) **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R).				
Landscape context score	1.12	**Vegetation Condition Score**	12.89	**Conservation significance score**	1.10
Unit biodiversity Score	15.88	**Area (ha)**	0.178	**Total biodiversity Score**	2.83

Table 6. Summary of VA2.

Vegetation Association	A2: *Acacia leiophylla* (Coast Golden Wattle) / *Acacia longifolia* (Coastal Wattle) / *Leucopogon parvifolius* (Coast Beard-heath) over *Kunzea pomifera* (Muntrie) Coastal Shrubland.				
					
General description	The understorey exotic cover was still present and being supplied by a number of exotic species and lifeforms. There were four regenerating species as well as the previously remnant mat and sedge plants. This community would eventually largely recover to level of surrounding vegetation with presence of woody weeds, particularly *Leptospermum laevigatum* (Coastal Tea Tree) and *Polygala myrtifolia* (Milkwort).				
Threatened species or community	No Threatened Ecological Communities were present in the Project Area Several flora and fauna species listed under the EPBC and/or NPW Act were determined as likely or possible to occur in the Project Area. **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E) **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R).				
Landscape context score	1.12	**Vegetation Condition Score**	47.02	**Conservation significance score**	1.10
Unit biodiversity Score	57.93	**Area (ha)**	0.868	**Total biodiversity Score**	50.28

Table 7. Summary of VA3.

Vegetation Association	A3: *Leucopogon parvifolius* (Coast Beard-heath) Mixed Low Coastal Shrubland.				
					
General description	There was a very high presence of *Polygala myrtifolia* (Milkwort) within this community, mostly as an understorey species in the more open sections; however, the species was also observed growing with a spindly habit through to the top of the shrub canopy. This community was the highest quality patch within the Project area.				
Threatened species or community	No Threatened Ecological Communities were present in the Project Area. Several flora and fauna species listed under the EPBC and/or NPW Act were determined as likely or possible to occur in the Project Area. **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E) **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R).				
Landscape context score	1.12	**Vegetation Condition Score**	50.49	**Conservation significance score**	1.10
Unit biodiversity Score	62.20	**Area (ha)**	0.094	**Total biodiversity Score**	5.85

Table 8. Summary of VA4.

Vegetation Association	A4: *Leucopogon parvifolius* (Coast Beard-heath) over *Lepidosperma gladiatum* (Coast Sword Sedge) Low Coastal Shrubland.				
					
General description	The shrub cover was sparser than surrounding areas and had a higher density of sedge species and *Olearia axillaris* (Coast Daisy) that was almost absent from the depression zones. This community had very little *Polygala myrtifolia* (Milkwort) but higher cover of *Leptospermum laevigatum* (Coast Tea Tree) than other sites, which increased with proximity to the roadside. Perennial grass species such as *Austrostipa exilis* (Heath spear grass) were also present. Several Wombat (*Vombatus ursinus*) burrows were present within this area.				
Threatened species or community	No Threatened Ecological Communities were present in the Project Area Several flora and fauna species listed under the EPBC and/or NPW Act were determined as likely or possible to occur in the Project Area. **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E) **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R).				
Landscape context score	1.12	**Vegetation Condition Score**	45.41	**Conservation significance score**	1.10
Unit biodiversity Score	55.94	**Area (ha)**	0.244	**Total biodiversity Score**	13.65

Table 9. Summary of VA5.

Vegetation Association	A5: *Acacia longifolia* ssp. *sophorae* (Coastal Wattle) Mixed Shrubland over exotic herbaceous forbs and grass species.				
					
General description	This community was regenerated from some modest disturbance and was present within a previously used motorcycle track area. The weed presence was lower than many other areas despite the open stratum type but had low cover of *Polygala myrtifolia* (Milkwort). The cover of *Kunzea pomifera* (Muntrie) was exceptionally high within this area and the bare ground was low. Species such as *Kennedia prostrata* (Scarlet Runner) and *Rytidosperma* sp. (Wallaby Grass) were unique to this site.				
Threatened species or community	No Threatened Ecological Communities were present in the Project Area Several flora and fauna species listed under the EPBC and/or NPW Act were determined as likely or possible to occur in the Project Area. **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E) **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R). - *Scaevola calendulacea* (Dune Fanflower) (SA: V) (Observed during survey).				
Landscape context score	1.12	**Vegetation Condition Score**	37.18	**Conservation significance score**	1.18
Unit biodiversity Score	49.13	**Area (ha)**	0.275	**Total biodiversity Score**	13.51

4.1.3. Site map showing areas of proposed impact

Figure 3. Map of Vegetation Associations within the Project Area.

4.2. Threatened species assessment

Threatened Ecological Communities (TEC)

One TEC was identified in the PMST report as potentially occurring within 5 km of the Project Area. Giant Kelp Marine Forests of South East Australia may occur within proximity of the Project Area; however, are not likely to have any interaction with the project in terms of potential increases in stormwater run-off or other secondary impacts.

Threatened Fauna

Forty-five nationally threatened fauna species were highlighted in the PMST report (Table 10). Many of these were marine species so are not relevant to the Project Area. One species was deemed to possibly occur within the Project area:

- Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E).

This species habitat is typically wet heath, heathy woodland, sedgeland and dense tussock grassland, rarely above 200m. Although this species is found in a variety of vegetation communities with different dominant floristic groups they have all contained a consistently high percentage of understorey cover (BIRD 2007). The Swamp Antechinus may utilise swamp habitat in close proximity to the Project site, such as *Gahnia trifida* (Coast Saw-sedge) Sedgeland. While not likely to be present as a permanent resident, it is possible individuals may disperse through the site.

The NatureMaps fauna supertable search (DEW, 2019) with a 5km buffer of the Project area showed 23 fauna species that are threatened at state level (Table 10 and Figure 4). Eight of these species were considered likely to occur or possible to occur within the Project Area:

- Grey Goshawk (*Accipiter novaehollandiae*) (SA: E);
- Blue-winged Parrot (*Neophema chrysostoma*) (SA: V);
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) (SA: E);
- Beautiful Firetail (*Stagonopleura bella interposita*) (SA: R);
- Southern Emuwren (*Stipiturus malachurus polionotum*) (SA: R);
- Bassian Thrush (*Zoothera lunulata*) (SA: R);
- Swamp Rat (*Rattus lutreolus*) (SA: R); and
- Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R).

The location of fauna species identified by the NatureMaps fauna supertable search are provided in Appendix 2.

Grey Goshawks generally inhabit tall, wet forests and relies on mature forests with regrowth older than 30 years for breeding. They also use woodlands, dry forests, wooded farmlands and suburban parks. There is no habitat within the Project Area that suits this species, but these habitat types are within the broader area and this species may be present flying over.

Blue-winged Parrots prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia ND). This type of habitat occurs within the Project Area and therefore, may be used by Blue-winged Parrots.

Grey-crowned Babblers inhabit open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. These habitat types may be in the broader area, but do not occur within the Project Area.

Beautiful Firetails are recorded in a range of habitats including dense heath and thick forests especially near sheoaks and tea-trees. Also occurs in coastal and sub-coastal heaths and heathy woodlands (DEH 2008). This habitat is present within the Project Area and therefore, may be used by Beautiful Firetails.

Southern Emu-wrens typically occur in coastal heaths, swamps, and areas with dense cover (Simpson and Day 1999, p. 170). This type of habitat is present in the Project Area, although degraded in places, and so may be used by Southern Emu-wrens.

Bassian Thrush occur in damp, densely forested areas and gullies, usually with a thick canopy overhead and leaf-litter below (Birds in Backyards ND). This type of habitat is not present within the Project Area, therefore, the proposed clearance is unlikely to impact on this species.

Swamp rats prefer poorly drained habitats, heathland, and sedges. This species has also been found on dry ridges in open forest. Density of vegetation seems to be the most important requirement of this species (AoLA 2021). Vegetation of this description occurs within the Project Area and may provide habitat for this species.

Common Brushtail Possums occur anywhere where trees with suitable hollows occur, including open forests and woodlands but also urban areas and cities. The species can be common in urban areas (Strahan, 2004). No suitable vegetation occurs within the Project Area, although there may be possums within the wider area.

Threatened Flora

Three nationally threatened species identified by the PMST as potentially occurring within the Project Area (Table 10):

- *Caladenia richardsiorum* (Little Dip Spider-orchid) (Aus.: EN, SA: V);
- *Pterostylis cucullata* (Leafy Greenhood) (Aus.: VU);
- *Senecio psilocarpus* (Swamp Fireweed) (Aus.: VU, SA: V).

Caladenia richardsiorum is known from a number of locations throughout coastal areas of the South East and within a wide range of coastal habitat structures. The presence of this species within the Project Area cannot be ruled out as there are records within 5 km of the Project Area; however, any incidences within Project area would be likely to be already known if present.

In Victoria (closest population to Project Area) *Pterostylis cucullata* occurs in Coast Tea-tree (*Leptospermum laevigatum*) or Moonah (*Melaleuca lanceolata*) coastal scrubs on stabilised sand dunes, with an open understorey. Historical records at Robe no longer occur (Duncan, 2010). There is suitable habitat within the Project Area, however no recent nearby records occur.

Senecio psilocarpus occurs on high-quality herb-rich wetlands on plains. The understorey is rich in grasses and sedges and miscellaneous aquatics. There is no suitable habitat for this species within the Project Area, therefore, it is unlikely to be impacted by this clearance.

Two species of state threatened flora were identified in the flora supertable as being recorded within the Project Area since 1995 (Table 10):

- *Eucalyptus fasciculosa* (Pink Gum) (SA: R);
- *Scaevola calendulacea* (Dune Fanflower) (SA: V).

Dune Fanflower was observed in VA A5 during the field survey. A summary of these species and comment regarding their likelihood of occurrence within the Project Area is provided in Table 10 below. The location of threatened flora species recorded within the 5 km buffer is shown in Appendix 2.

Species observed on site, or recorded within 5km of the application area since 1995, or the vegetation is considered to provide suitable habitat

Table 10. Threatened fauna and flora species identified by the EPBC Protected Matters Search Tool and a BDBSA search (NatureMaps) potentially occurring within the Project Area.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Birds						
Accipiter novaehollandiae (Grey Goshawk)		E	1	2002	Preferred habitat is heavily treed and humid forest areas such as rainforests and very dense, tall eucalypt forest. Found in northern and eastern Australia.	Possible – May occur in area, but unlikely to use habitat.
Ardea intermedia plumifera (Plumed Egret)		R	1	2003	Is mainly found around shallow inland freshwater areas with abundant emergent aquatic vegetation. This includes habitats such as seasonally flooded marshes, inland deltas, ponds, swamp forests, freshwater swamps, pools, rivers, streams, rice-fields, wet meadows, and flooded and dry pastures near water.	Unlikely – no suitable habitat within the Project Area.
Biziura lobata menziesi (Musk Duck)		R	1	2003	Endemic to Australia. Occurs in deep freshwater lagoons, with dense reed beds. They are normally seen singly or in pairs, but may form medium to large groups in the winter.	Unlikely – no suitable habitat in the Project Area.
Botaurus poiciloptilus (Australasian Bittern)	EN	V	2	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 - May utilise waste water treatment plant but flyover within Project area only.
Calidris canutus (Red Knot)	EN		2	Known to occur	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They rarely use inland lakes or swamps (Higgins & Davies 1996) (DAWE 2020).	Unlikely - Unlikely within shrublands.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Calidris ferruginea (Curlew Sandpiper)	CE		2	Known to occur	In South Australia, Curlew Sandpipers occur in widespread coastal and subcoastal areas east of Streaky Bay. 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.	Unlikely - While possible that the Curlew Sandpiper could occur on the coastline adjacent to the Project area, their presence would be expected to be rare and therefore any occurrence within Project area is unlikely.
Diomedea antipodensis (Antipodean Albatross)	VU	V	2	Likely to occur	The Antipodean Albatross is marine, pelagic and aerial. It sleeps and rests on ocean waters when not breeding. (DAWE, 2020).	Unlikely - Pelagic seabird
Diomedea epomophora (Southern Royal Albatross)	VU	V	2	Likely to occur	Marine. Subtropical to sub-Antarctic oceans. Occurring over open ocean and shallower inshore waters (Morcombe eGuide 2020).	Unlikely - Pelagic seabird
Diomedea exulans (Wandering Albatross)	VU	V	2	Likely to occur	The Wandering Albatross is marine, pelagic and aerial. On breeding islands, the Wandering Albatross nests on coastal or inland ridges, slopes, plateaux and plains, often on marshy ground (DAWE 2020).	Unlikely - Pelagic seabird
Diomedea sanfordi (Northern Royal Albatross)	EN	E	2	Likely to occur	The Northern Royal Albatross is marine, pelagic and aerial. Its habitat includes subantarctic, subtropical, and occasionally Antarctic waters.	Unlikely - Pelagic seabird
Egretta garzetta nigripes (Little Egret)		R	1	2003	It inhabits fresh, brackish or saline wetlands and shows a preference for shallow waters (10-15 cm deep) in open, unvegetated sites where water levels and dissolved oxygen levels fluctuate daily, tidally or seasonally, and where fish are concentrated in pools or at the water's surface.	Unlikely – no suitable habitat in the Project Area.
Egretta sacra sacra (Pacific Reef Heron)		R	1	1997	Found on the coast and islands of most of Australia, but is more common on the Queensland coast and Great Barrier Reef than elsewhere. Lives on beaches, rocky shores, tidal rivers and inlets, mangroves, and exposed coral reefs.	Unlikely – no suitable habitat in the Project Area.
Haematopus fuliginosus fuliginosus (Sooty Oystercatcher)		R	1	2014	The Sooty Oystercatcher is strictly coastal, usually within 50 m of the ocean. It prefers rocky shores, but will be seen on coral reefs or sandy beaches near mudflats (BirdLife Australia, 2020).	Unlikely – no suitable habitat in the Project Area.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Haematopus longirostris (Pied Oystercatcher)		R	1	2014	The Pied Oystercatcher prefers mudflats, sandbanks and sandy ocean beaches and is less common along rocky or shingle coastlines (BirdLife Australia, 2020).	Unlikely – no suitable habitat in the Project Area.
Leipoa ocellata (Malleefowl)	VU	V	2	Likely to occur	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, *Melaleuca uncinata* vegetation or coastal heathlands. (DOE 2014c).	Unlikely - No records within 5 km of the Project area. The Project area falls outside of the distribution of the Malleefowl (ALA, 2019). The Project area is also comprised of inappropriate habitat for the species, which inhabits mallee, heath and other scrubs (Pizzey and Knight 2007).
Lewin pectoralis pectoralis (Lewin's Rail)		V	1	1998	Inhabits mallee heathlands and less commonly in associated mallee with a more open understorey (such as Spinifex associations). Is also occasionally recorded in River Red Gums bordering waterways. (NSW Government Environment and Heritage 2014d).	Unlikely – no suitable habitat within the Project Area.
Neophema chrysogaster (Orange-bellied Parrot)	CE	E	2	Known to occur	A total of eight observations of Orange-bellied Parrot have been recorded in South Australia since 2010 (ALA, 2019). These observations have occurred primarily in the far south east of the state; however, have also occurred on the southern Fleurieu Peninsula, Lake Alexandrina, and the Coorong. Given the population size and relatively few records of the Orange-bellied Parrot in South Australia over the past decade, it is unlikely that the species would occur within the Project area. Furthermore, if the species were to occur, their presence would be temporal, due to their nomadic nature in their winter distribution.	Unlikely – No recent records within the Project Area.
Neophema chrysostoma (Blue-winged Parrot)		V	1	2018	This species prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones (Birdlife Australia ND).	Likely – nearby recent records and suitable habitat present in the Project Area.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Oxyura australis (Blue-billed Duck)		R	1	2003	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 – No suitable habitat within the Project Area.
Pachyptila turtur subantarctica (Fairy Prion)	VU		2	Likely to occur		Unlikely - Pelagic seabird
Phoebetria fusca (Sooty Albatross)	VU	E	2	Likely to occur		Unlikely - Pelagic seabird
Podiceps cristatus australis (Great Crested Grebe)		R	1	2002	Nesting colonies of the Greater Crested Grebe may be found in southern Australia and New Zealand, with individuals wintering in eastern and northern Australia. During breeding season, habitat is freshwater lakes with aquatic and marginal vegetation. During non-breeding season, habitat is fresh or saline waters – lakes, lagoons, estuaries and bays (Simpson and Day 1999, p. 50).	Unlikely – no suitable habitat within the Project Area.
Pomatostomus temporalis temporalis (Grey-crowned Babbler)		E	1	2003	This species occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains (Environment and Heritage 2014).	Possible – possibly in area but no suitable habitat within the Project Area.
Rostratula australis (Australian Painted Snipe)	EN	V	2	Likely to occur	The Painted Snipe inhabits vegetated waterbodies, such as dams and wetlands, and therefore suitable habitat is not present within the Project area.	Unlikely – No suitable habitat within the Project Area.
Sternula nereis nereis (Australian Fairy Tern)	VU	E	1, 2	2011, Known to occur	Habitat is coasts, estuaries; breeds on sandy beaches and sand spits (Simpson and Day 1999, p. 106). Occurs along coastlines in all States except for NT, QLD and NSW (Simpson and Day 1999, p. 106).	Unlikely - Fairy Terns have numerous records within 5 km of the Project area (ALA, 2019). Given the close proximity of these records to the Project area, it is considered likely that Fairy Terns would occur as a flyover however unlikely to utilise the Project area.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Spatula rhynchotis (Australasian Shoveler)		R	1	2003	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 suitable habitat within the Project Area.
Stagonopleura bella interposita (Beautiful Firetail)		R	1	2019	Recorded in a range of habitats including dense heath and thick forests especially near sheoaks and tea-trees. Also occurs in coastal and sub-coastal heaths and heathy woodlands (DEH 2008).	Possible – suitable habitat within the Project Area and recent nearby records.
Stipiturus malachurus polionotum (Southern Emuwren)		R	1	1997	The Southern Emu-wren (South East ssp) occurs in SE South Australia and adjacent sw Victoria. Habitat is coastal heaths, swamps, dense cover (Simpson and Day 1999, p. 170).	Possible – suitable habitat within the Project Area.
Thalassarche cauta cauta (Shy Albatross)	VU	V	2	Likely to occur		Unlikely - Pelagic seabird
Thalassarche cauta steadi (White-capped Albatross)	VU		2	Likely to occur		Unlikely - Pelagic seabird
Thalassarche salvini (Salvin's Albatross)	VU	V	2	Likely to occur		Unlikely - Pelagic seabird
Thinornis rubricollis rubricollis (Hooded Plover, eastern)	VU	V	2	Known to occur	The hooded plover is found on broad, sandy surf beaches, showing preference for beaches backed by sand dunes, with large amounts of seaweed.	Unlikely - Hooded Plovers are highly likely to occur adjacent to the Project area on the local beaches but do not utilise the habitat present within the Project area.
Zoothera lunulata (Bassian Thrush)		R	1	2002	Damp, densely forested areas and gullies are favoured by the Bassian Thrush, usually with a thick canopy overhead and leaf-litter below (Birds in Backyards ND). Kangaroo Island, Mount Lofty Ranges and southern Flinders Ranges populations belong to the subspecies Z. l. halmaturina (A. G. Campbell, 1906). Those in the South-East are not yet identified but may be intergrades between halmaturina and the nominate subspecies (Schodde and Mason, 1999).	Possible – recent record, may have suitable habitat in Project Area.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Amphibian						
Litoria raniformis (Southern Bell Frog)	VU	V	2	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; montane eucalypt forest, dry schlerophyll forest in coastal Victoria. (Clemann N. and Gillespie G.R. 2012)	Unlikely - This species utilises fresh waterbodies however no records occur within close proximity to the site. No waterbodies are present within the Project area.
Mammal						
Antechinus minimus maritimus (Swamp Antechinus, mainland)	VU	E	1, 2	2020, Likely to occur	Habitat is typically wet heath, heathy woodland, sedgeland and dense tussock grassland, rarely above 200m. Although this species is found in a variety of vegetation communities with different dominant floristic groups they have all contained a consistently high percentage of understorey cover (BIRD 2007).	Possible - May utilise swamp habitat in close proximity to the Project site such as *Gahnia trifida* (Coast Saw-sedge) Sedgeland, potential habitat for the species within the Project area. While not likely to be present as a permanent resident, it is possible individuals disperse through the site.
Isoodon obesulus obesulus (Southern Brown Bandicoot)	EN	V	2	Likely to occur		Unlikely - The Project Area falls outside the distribution of the population of Southern Brown Bandicoots in south-eastern South Australia (ALA, 2019).
Miniopterus orianae bassanii (Southern Bent-wing Bat)	CE	E	2	Likely to occur		Unlikely - There is one isolated record of the species from Robe in 1990. Records of the Southern Bent-wing Bat are concentrated around the Naracoorte Caves and Mt Gambier, South Australia (ALA, 2019).

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Neophoca cinerea (Australian Sea-lion)	VU	V	2	Known to occur		Unlikely - Specimens collected at Beachport and Robe, presumably washed up (ALA, 2019). No coastal habitat in the area.
Pteropus poliocephalus (Grey-headed Flying-Fox)	VU	R	1	2020, May occur		Unlikely – Possible fly over, unlikely to use habitat within Project Area.
Rattus lutreolus (Swamp Rat)		R	1	2001	*Rattus lutreolus* prefers poorly drained habitats, heathland, and sedges. This species has also been found on dry ridges in open forest. Density of vegetation seems to be the most important requirement of this species (AoLA 2021).	Likely – Suitable habitat in the Project Area.
Trichosurus vulpecula (Common Brushtail Possum)		R	1	1997	Anywhere where trees with suitable hollows occur, including open forests and woodlands but also urban areas and cities. The species can be common in urban areas (Strahan, 2004).	Likely – May occur in nearby vegetation
Migratory Marine						
Anous stolidus (Common Noddy)	Mi.		2	Likely to occur		Unlikely - Pelagic seabird
Apus pacificus (Fork-tailed Swift)	Mi.		2	Likely to occur	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	Unlikely - A widespread species, the Fork-tailed Swift is almost exclusively aerial, over a wide range of inland habitats including foothills, open farmland and open forests.
Migratory Terrestrial						
Hirundapus caudacutus (White-threated Needletail)	Mi.		1, 2	2003, Likely to occur	Almost exclusively aerial in Australia, recorded most commonly above wooded areas (DAWE, 2020).	Unlikely - Vagrant

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Motacilla cinerea (Grey Wagtail)	Mi.		2	Known to occur	European and asian species. Migrates south in winter, usually to Indonesia and NG. Rarely reaches Australia, but when it does, favours habitat near freshwater streams, also mown grass, ploughed land or near sewage ponds. (Morcombe eGuide 2020).	Unlikely - Vagrant. A migratory species found within Europe, Asia and North America, has been recorded in Australia infrequently. Most of these records are from northern Australia.
Actitis hypoleucos (Common Sandpiper)	Mi.	R	1, 2	2003, Known to occur	Habitat is banks, rocks and sandy beaches near water. Found in coastal or inland wetlands, both saline or fresh.	Possible flyover - Wide range of wetland habitats. Unsuitable habitat on site but possible flyover species.
Marine						
Arenaria interpres (Ruddy Turnstone)	Mi.	R	2	Known to occur	Widespread within Australia during its non-breeding period of the year. It is found in most coastal regions, with occasional records of inland populations. It strongly prefers rocky shores or beaches where there are large deposits of rotting seaweed. (DAWE 2020).	Unlikely - Mostly known from coastal shore locations amongst wrack on beach. Unsuitable habitat on site but possible flyover species.
Calidris acuminata (Sharp-tailed Sandpiper)	Mi.	R	2	Known to occur	During the non-breeding season, most of the world population of Sharp-tailed Sandpipers occurs in Australia. In SA and Victoria, numbers are generally highest between January and early February. In Gulf St Vincent, SA, some arrive during September–October, with the greatest numbers during December. Movements occur during the non-breeding period where birds appear to be dispersive, moving to temporary or flooded wetlands and leaving them when they dry. On migration, they forage and roost on rocky and sandy beaches, freshwater habitats and inland saltwater habitats (DAWE, 2020).	Possible flyover - Wide range of wetland habitats. Unsuitable habitat on site but possible flyover species.
Calidris ruficollis (Red-necked Stint)	Mi.		2	Known to occur	Occurs in a wide range of wetland habitats.	Unlikely - Unsuitable habitat on site but possible flyover species.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Gallinago hardwickii (Latham's Snipe)	Mi.	R	1, 2	2019, Known to occur	Found across south-eastern SA (including the Adelaide plains and Mount Lofty Ranges, and the Eyre Peninsula). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) sometimes ephemeral and flooded paddocks; however, they do appear to require some level of low vegetation for protection.	Unlikely - Degraded and largely unsuitable habitat on site.
Gallinago megala (Swinhoes Snipe)	Mi.		2	Likely to occur	Occurs in a range of wetland habitats.	Unlikely - suitable habitat is not present for this species within the Project area.
Gallinago stenura (Pin-tailed Snipe)	Mi.		2	Likely to occur	Occurs in a range of wetland habitats.	Unlikely - suitable habitat is not present for this species within the Project area.
Numenius minutus (Little Curlew)	Mi.		2	Likely to occur	Lives in permanent or ephemeral wetlands of varying salinity. Forages in the shallow water at the edge of wetlands.	Unlikely – unsuitable habitat within the Project Area.
Pandion cristatus/haliaetus (Eastern Osprey)	Mi.	E	2	Known to occur	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	Unlikely – unsuitable habitat within the Project Area.
Pluvialis fulva (Pacific Golden Plover)	Mi.		2	Known to occur	Lives in permanent or ephemeral wetlands of varying salinity. Forages in the shallow water at the edge of wetlands.	Unlikely - unsuitable habitat within the Project Area.
Tringa brevipes (Grey-tailed Tattler)	Mi	R	1, 2	2018, Known to occur	In SA, the species is uncommonly recorded along the coasts between Port MacDonnell and Denial Bay. It is also found west of Streaky Bay (DOE 2014).	Unlikely – no suitable habitat within the Project Area.
Tringa nebularia (Common Greenshank)	Mi.		2	Known to occur	Inhabits a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. Typical in large mudflats, saltmarsh, mangroves and seagrass.	Unlikely - Habitat not suitable on site.

Scientific name	Cons. status		Data Source	Date of last record/ PMST likelihood	Species known habitat preferences	Likelihood of use for habitat - Comments
	Aus	SA				
Tringa stagnatilis (Marsh Sandpiper)	Mi.		2	Known to occur	Lives in permanent or ephemeral wetlands of varying salinity. Forages in the shallow water at the edge of wetlands.	Unlikely - Habitat not suitable on site.
Flora						
Caladenia richardsiorum (Little Dip Spider-orchid)	EN	V	1, 2	2018, Likely to occur	Known from a number of locations throughout coastal areas of the South East and within a wide range of coastal habitat structures.	Possible - Can't be ruled out from Project area; however, any incidences within Project area would be likely to be already known if present.
Eucalyptus fasciculosa (Pink Gum)		R	1	2002	Pink gum grows in woodland or as an emergent low shrubland on soil of low fertility.	Unlikely – appropriate habitat not present.
Pterostylis cucullata (Leafy Greenhood)	VU		2	Likely to occur	In Victoria (closest population to Project Area) it occurs in Coast Tea-tree (*Leptospermum laevigatum*) or Moonah (*Melaleuca lanceolata*) coastal scrubs on stabilised sand dunes, with an open understorey. Historical records at Robe no longer occur (Duncan, 2010).	Possible – suitable habitat, although no recent nearby records.
Scaevola calendulacea (Dune Fanflower)		V	1	2018	On coastal cliffs and dunes. SA: SL SE.	Possible – possible suitable habitat within Project Area, although recent records occur next to Lake Robe.
Senecio psilocarpus (Swamp Fireweed)	VU	V	2	Likely to occur	Occurs on high-quality herb-rich wetlands on plains. A tree canopy is absent from most sites, or rarely, Eucalyptus camaldulensis (River Red Gum) is the overstorey species in a woodland formation. The understorey is rich in grasses and sedges and miscellaneous aquatics.	Unlikely – no suitable habitat within the Project Area.

Source; 1 – NatureMaps, 2 - Protected matters search tool.
NP&W Act; E= Endangered, V = Vulnerable, R= Rare
EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable

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.

4.3. Substantially intact stratum

If the vegetation is considered to represent a substantially intact stratum, the NVC cannot approve clearance, unless for the purpose of harvesting native vegetation (section 27(3)).

Provide information on whether the native vegetation constitutes a continuous intact stratum.
Remnancy figures for the region are presented Table 11.

Table 11. Significance of remnancy of vegetation within the Project Area

Hierarchy Level	Remnancy Value	Project Area
IBRA Association (Beachport)	14%	At Variance
IBRA Sub-region (Bridgewater)	43%	Not at Variance
Mean patch area within a within 5km radius of project area	39%	

The Project Area consists of 1.659 ha of clearance and is part of a broader area of contiguous vegetation. The area selected for clearance was considered to be an area of poorer quality vegetation within the property.

Vegetation Association A1 is a highly degraded exotic grassland with some low-level regeneration and ground cover mat plants remnant from before disturbance. The site had a low native:exotic plant species ratio with *Euphorbia terracina* being the most abundant. The site had high levels of historical illegal rubbish dumping and motorcycle tracks. The site was slowly regenerating; however, high cover of Buffalo Grass (*Stenotaphrum secundatum*) will mean that full recovery not likely without intervention.

Vegetation Association A2 had a high presence of understorey exotic cover predominantly of a number of exotic species and lifeforms. There was a high number of regenerating species as well as mat and sedge plants. The woody weeds, *Leptospermum laevigatum* (Coastal Tea Tree) and *Polygala myrtifolia* (Milkwort) were present in this association.

Vegetation Association A3 had a very high cover of shrubs and climbing plants with a density that was almost impenetrable in places. There was a high presence of *Polygala myrtifolia* (Milkwort) within this community, mostly as an understorey species in the more open sections; however, the species was also observed growing with a spindly habit through to the top of the shrub canopy.

In Vegetation Association A4 the shrub cover was sparser than surrounding areas and had a higher density of sedge species and *Olearia axillaris* (Coast Daisy) that was almost absent from the depression zones. This community had very little *Polygala myrtifolia* (Milkwort) but higher cover of *Leptospermum laevigatum* (Coast Tea Tree) than other sites, which increased with proximity to the roadside. There were some regenerating species and a lower weed threat than other associations.

Vegetation Association A5 has partially regenerated from some modest disturbance that was caused by the presence of a motorcycle track area. The weed presence was lower than many other areas despite the open stratum type but had a high presence of weed grasses. The cover of *Kunzea pomifera* (Muntrie) was exceptionally high within this area and the bare ground was low.

The vegetation under application in all 5 vegetation associations was assessed against the benchmark conditions scores listed in the Volume 3 of the Vegetation Communities of the South-east (Croft, Pedler, Milne, 2012) for Benchmark

Community 7.2. Coastal Dune Shrublands. Attributes are listed in Table 12. Based on these scores, A1 considered to be in *poor* to *moderate* condition, A2 is in a predominantly *moderate* to *good* condition, A3 is also considered in a predominantly *moderate* to *good* condition, A4 is in a *moderate* to *good* condition and A5 is in a predominantly *moderate* condition.

Table 12. Characteristics of a healthy Coastal Dune Shrubland.

Condition indicator	A1 Value	A2 Value	A3 Value	A4 Value	A5 Value	Benchmark comparison
Native plant species diversity for Coastal Dune Shrublands	6 (Poor)	18 (Good)	18 (Good)	15 (Good)	14 (Good)	1-4 (Very Poor) 5-8 (Poor) 9-13 (Moderate) 14-19 (Good) 20+ (Excellent)
Weed Abundance and Threat	21 (Poor)	19 (Poor)	23 (Poor)	17 (Moderate)	21 (poor)	>25% (Very Poor) 18-25% (Poor) 12-17% (Moderate) <7-11% (Good) 0-6% (Excellent)
Structural diversity B – Plant Life Forms	4 (Poor)	9 (Moderate)	8 (Moderate)	9 (Moderate)	8 (Moderate)	<4 (Very Poor) 4-6 (Poor) 7-9 (Moderate) 10-12 (Good) 13+ (Excellent)
Regeneration – Trees & Woody Shrubs	2 (Moderate)	6 (Excellent)	4 (Excellent)	3 (Good)	2 (Moderate)	0 (Very Poor) 1 (Poor) 2 (Moderate) 3 (Good) 4 (Excellent)

Provide information on whether the native vegetation has been subject to degradation within the past 20 years.

The Project Area occurs adjacent to an industrial area and has recently been rezoned as an industrial area. The area has been disturbed by the presence of a motorcycle track and this area has resulted in some degradation. More recently, the motorcycle track has not been used and therefore, was able to regenerate, improving the condition within the last 20 years. Vegetation Associations A3 & A4 have had less disturbance than the other Vegetation Associations.

Provide a key finding on whether any or all of the area of impact could be considered as substantially intact.

Based on the condition of the vegetation at the time of survey the vegetation of all Vegetation Associations are unlikely to be considered substantially intact as the incursion of weeds in the understory is higher than 50% of the biomass at all sites, and the overstorey also contains woody weeds, some of which are abundant within Vegetation Associations (particularly VA3).

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

If the clearance is seriously at variance with one or more of the principles, the NVC cannot approve clearance, however, the Act provides the NVC with a degree of discretion in certain situations

Principle of Clearance	**Considerations**
Principle 1a - it comprises a high level of diversity of plant species	Relevant information Patch species diversity: A1 - 6 native species, 11 introduced A2 - 18 native species, 9 introduced A3 – 18 native species, 5 introduced A4 – 15 native species, 4 introduced A5 – 13 native species, 11 introduced *Bushland Plant Diversity Score* A1: 8 A2: 22 A3: 22 A4: 18 A5: 18
	Assessment against the principles Seriously at Variance A2, A3 (>20 native plant species diversity score) At Variance – A4 & A5 (10-20 native plant species diversity score)
	Moderating factors that may be considered by the NVC - Amount of clearance related to area of remnant vegetation The IBRA association has 43% native vegetation remaining and the IBRA subregion has 14% of native vegetation remaining.

Principle 1b - significance as a habitat for wildlife	Relevant information Species were assessed for likelihood of occurrence based on findings of a PMST and BDBSA search. Eight fauna species were considered possibly or likely to occupy the site: Threatened species which may use the vegetation include: **EPBC** - Swamp Antechinus (mainland) (*Antechinus minimus maritimus*) (Aus.: VU; SA: E). **NPW Act** - Grey Goshawk (*Accipiter novaehollandiae*)(SA: E); - Blue-winged Parrot (*Neophema chrysostoma*)(SA: V); - Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)(SA: E); - Beautiful Firetail (*Stagonopleura bella interposita*)(SA: R); - Southern Emuwren (*Stipiturus malachurus polionotum*)(SA: R); - Bassian Thrush (*Zoothera lunulata*)(SA: R); - Swamp Rat (*Rattus lutreolus*)(SA: R); and - Common Brushtail Possum (*Trichosurus vulpecula*) (SA: R). Patches; **A1** Threatened Fauna Score – 0.1 Unit biodiversity Score – 15.88 **A2** Threatened Fauna Score – 0.1 Unit biodiversity Score – 57.93 **A3** Threatened Fauna Score – 0.1 Unit biodiversity Score – 62.20 **A4** Threatened Fauna Score – 0.1 Unit biodiversity Score – 55.94 **A5** Threatened Fauna Score – 0.1 Unit biodiversity Score – 49.13
	Assessment against the principles Seriously at Variance All
	Moderating factors that may be considered by the NVC For the Swamp Antechinus the following moderating factors could be considered by the NVC: Clearance would have a negligible impact on this species over the long term. This species habitat is typically wet heath, heathy woodland, sedgeland and dense tussock grassland. Although this species is found in a variety of vegetation communities with different dominant floristic groups they have all contained a consistently high percentage of understorey cover (BIRD 2007). The

	Swamp Antechinus may utilise swamp habitat in close proximity to the Project site such as *Gahnia trifida* (Coast Saw-sedge) Sedgeland, potential habitat for the species within the Project area. While not likely to be present as a permanent resident, it is possible individuals disperse through the site. *Impact significance* Is the clearance likely to: • Lead to a long-term decrease in the size of a population; • Reduce the area of occupancy of the species; • Fragment an existing population into two or more populations; • Adversely affect habitat critical to the survival of a species; • Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; • Result in invasive species that are harmful to a threatened species becoming established in the threatened species habitat; and • Interfere with the recovery of the species.
Principle 1c - plants of a rare, vulnerable or endangered species	<u>Relevant information</u> The threatened species *Scaevola calendulacea* (Dune Fanflower) was observed in vegetation association A5. Two species were assessed as possibly or likely to occupy the Project Area but would not have been detected during the field survey: - *Caladenia richardsiorum* (Little Dip Spider-orchid) (Aus.: EN, SA: V); - *Pterostylis cucullata* (Leafy Greenhood) (Aus.: VU); Threatened Flora Scores A1 – 0 A2 – 0 A3 – 0 A4 – 0 A5 – 0.08
	<u>Assessment against the principles</u> <u>Seriously at Variance</u> NA <u>At Variance</u> – A5
	<u>Moderating factors that may be considered by the NVC</u> NA
Principle 1d - the vegetation comprises the whole or part of a plant	<u>Relevant information</u> No Threatened Ecological Communities were present within the Project Area. Threatened Community Score – 1 (All)
	<u>Assessment against the principles</u> <u>Not at Variance</u>

<table>
<tr><td>community that is Rare, Vulnerable or endangered:</td><td>Moderating factors that may be considered by the NVC
NA</td></tr>
<tr><td rowspan="3">Principle 1e - it is significant as a remnant of vegetation in an area which has been extensively cleared.</td><td>Relevant information

<table><tr><th>Hierarchy Level</th><th>Remnancy Value</th><th>Project Area</th></tr><tr><td>IBRA Association (Beachport)</td><td>43%</td><td>At Variance</td></tr><tr><td>IBRA Sub-region (Bridgewater)</td><td>14%</td><td>At Variance</td></tr><tr><td>Mean patch area within a within 5km radius of project area</td><td>39%</td><td></td></tr></table>Total Biodiversity Score –

A1 – 2.83
A2 – 50.28
A3 – 5.85
A4 – 13.65
A5 – 13.51</td></tr>
<tr><td>Assessment against the principles
Not at Variance</td></tr>
<tr><td>Moderating factors that may be considered by the NVC
NA</td></tr>
<tr><td rowspan="3">Principle 1f - it is growing in, or in association with, a wetland environment.</td><td>Relevant information
No vegetation within the Project Area is associated with a wetland environment</td></tr>
<tr><td>Assessment against the principles
Not at variance</td></tr>
<tr><td>Moderating factors that may be considered by the NVC
NA</td></tr>
<tr><td rowspan="3">Principle 1g - it contributes significantly to the amenity of the area in which it is growing or is situated.</td><td>Relevant information
The site is on the fringe of a coastal conservation zoned area, but is privately owned and is not frequented by the public.
As part of an area of native vegetation, it is possible that the revegetation corridor has a high community value, however, the area proposed to be cleared consists of the poorest quality vegetation on the parcel of land.</td></tr>
<tr><td>N/A</td></tr>
<tr><td>Moderating factors that may be considered by the NVC
NA</td></tr>
</table>

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

4.5. Address the Mitigation Hierarchy

The Native Vegetation Council will consider if the applicant has avoided and minimized the clearance of native vegetation as much as practically possible.

a) Avoidance
The development reasonably requires maximum utilisation of the block for industrial development. Within the block of land, areas of higher quality vegetation have been avoided and the proposed clearance is in the area of poorer quality vegetation.

b) Minimization
At this stage, the remainder of the vegetation within the parcel of land owned by Barry Bowyer will be retained.

c) Rehabilitation or restoration
No rehabilitation or restoration works are proposed as part of this clearance application.

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

4.6. Risk assessment

The level of risk associated with the application

Table 13. Summary of the level of risk associated with the application.

Total clearance	No. of trees	-
	Area (ha)	1.659
	Total biodiversity Score	86.12
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b)
Risk assessment outcome		Level 4

5. Clearance summary

Clearance Area(s) Summary table

Block	Site	Species diversity score	Threatened Ecological community Score	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1	8	1	0	0.1	15.88	0.178	2.83	1			2.97	2,490.23	136.96
A	2	22	1	0	0.1	57.93	0.868	50.28	1			52.80	44,290.33	2,435.97
A	3	22	1	0	0.1	62.2	0.094	5.85	1			6.14	5,150.06	283.25
A	4	18	1	0	0.1	55.94	0.244	13.65	1			14.33	12,023.31	661.28
A	5	18	1	0.8	0.1	49.13	0.275	13.51	1			14.19	6,792.64	373.59
						241.08	**1.659**	**86.12**				**90.43**	**70,746.57**	**3,891.05**

Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	86.12	90.43	70,746.57	3,891.05	74,637.62

Economies of Scale Factor	0.5
Rainfall (mm)	636

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:

Barry Bowyer proposes to achieve the SEB by paying into the Native Vegetation Fund. The total SEB payment required for the clearance of 1.659 ha of native vegetation is $74,637.62, which includes an administration fee of $3,891.05 including GST.

7. References

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8. Appendices

8.1.1. Appendix 1. Bushland Assessment Scoresheets associated with the proposed clearance (to be submitted in Excel format) (Attached)

- EX210202_Bushland Assessment Scoresheet_A1
- EX210202_Bushland Assessment Scoresheet_A2
- EX210202_Bushland Assessment Scoresheet_A3
- EX210202_Bushland Assessment Scoresheet_A4
- EX210202_Bushland Assessment Scoresheet_A5

8.1.2. Appendix 2. Threatened fauna and flora maps from BDBSA Search (NatureMaps).

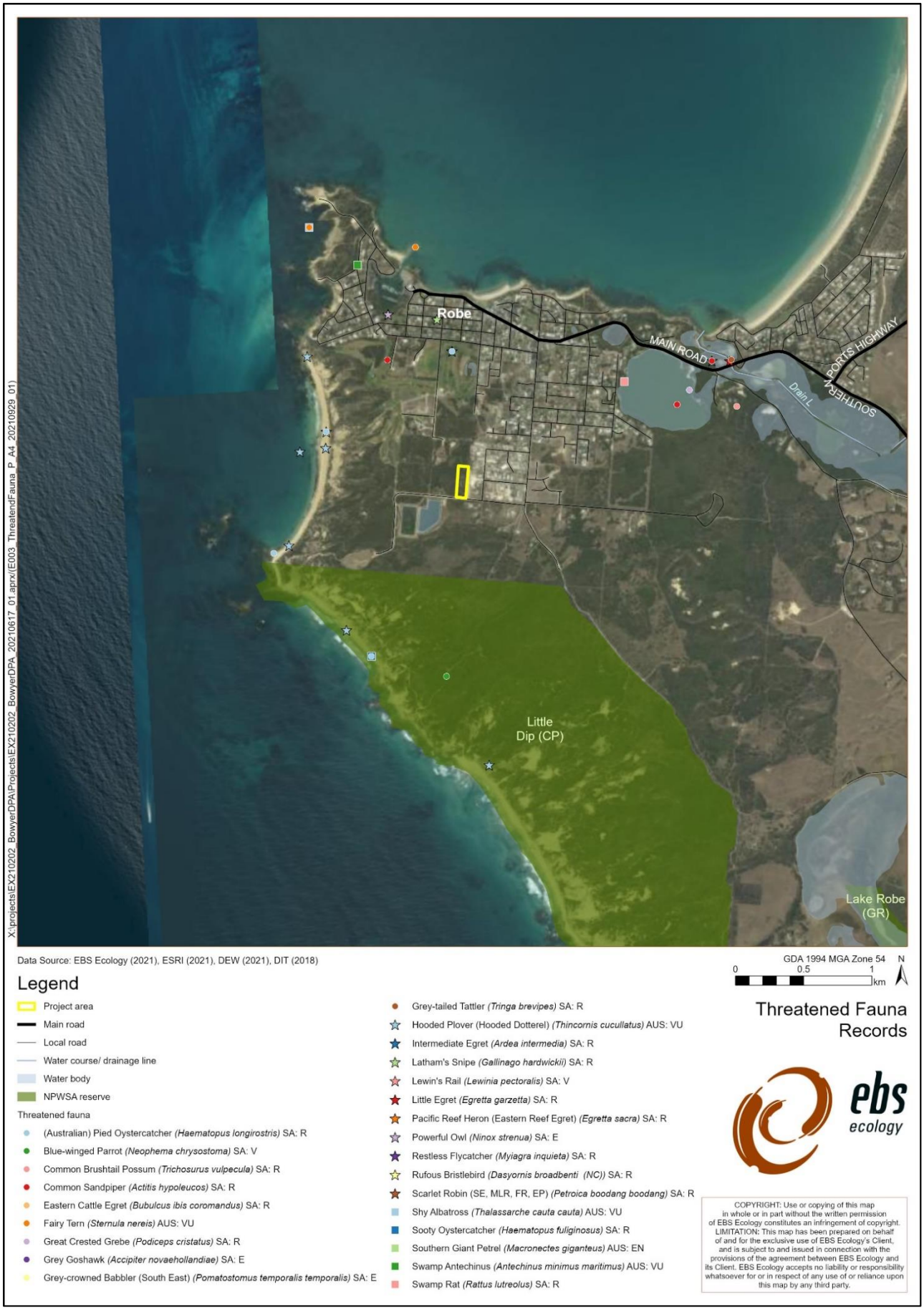

Figure 4. Threatened fauna records within 5 km of Project Area (<1km reliability).

Figure 5. Threatened flora within 5km of Project Area with <1km spatial accuracy.

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