



*The***Barossa** Council



The Barossa Council

Roadside Vegetation Management Plan

2023-2026

The Barossa Council Roadside Vegetation Management Plan 2023-2026

September 2023

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Draft Prepared by EBS Ecology for The Barossa Council

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Message from the Mayor and Chief Executive

The Barossa Council (Council) is proud of its natural heritage and is committed to its protection. With less than 3% of remnant native vegetation remaining across the Adelaide and Mount Lofty Ranges and considering the ecosystem services this vegetation provides for free, we must value the unique and biological diversity of our region and commit to the ongoing preservation of those areas where it still stands.

We have a responsibility to the community and the environment to manage the remnant roadside vegetation in a way that enhances its condition. Our agricultural, viticultural and tourism sectors rely on these essential ecosystem services.

This Roadside Vegetation Management Plan (RVMP) will provide council staff and its contractors, with the tools to manage our roadsides in a way that will protect and enhance the vegetation with minimal impacts. As it stands now, this plan is an important record of the remaining vegetation, and its current condition, and will help to guide and influence our management on the ground moving forward.

We are very grateful for the funding support from the Northern and Yorke Landscape Board and feel confident that this Plans' clear policy and coherent language will be a valuable tool for sustainable management of our roadsides for future generations.

Chief Executive Officer

Martin McCarthy



Mayor

Bim Lange



Endorsement and Acknowledgements

Council acknowledges the traditional owners of this land: Peramangk, Ngadjuri and Kaurna people and pay respect to Elders past, present and future. We acknowledge the stories, traditions and living cultures of Aboriginal and Torres Strait Islander peoples on this land and commit to building a brighter future together.

This Roadside Vegetation Management Plan (RVMP) 2023-2026 was prepared in line with the *Native Vegetation Regulations 2017* and the Guidelines for the Management of Roadside Native Vegetation and Regrowth Vegetation under Native Vegetation Regulation 11(23).

This RVMP was formally approved by Council on 08/06/2023 and subsequently endorsed by the Native Vegetation Council (NVC) on 05/09/2023. Continued endorsement of the Plan by the NVC depends on the result of periodic reviews. This Plan is valid for a period of three years, at which time it will be reviewed by Council and resubmitted to the NVC with any amendments. Subsequent reviews will be conducted at five-yearly intervals.

Delegations	Responsible Council Officer
Management of approvals	Director, Infrastructure and Environmental Services
Implementation of Plan	Director, Infrastructure and Environmental Services
Annual Works Program	Director, Infrastructure and Environmental Services
Annual Monitoring and Reporting requirements	Manager, Infrastructure and Environmental Services, Senior Environmental Officer

Scheduled RVMP review	Responsible Council Officer
05/09/2026 (3 years from endorsement, then 5 years for subsequent reviews)	Manager, Infrastructure and Environmental Services

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1 INTRODUCTION

ABOUT THIS PLAN

The Barossa Council (Council) is committed to the ongoing protection of roadside native vegetation. This Roadside Vegetation Management Plan (RVMP) outlines:

- the remnant vegetation that exists along roadsides within Council, with an emphasis on Council managed roads
- the management issues with potential to impact on roadside vegetation
- Council's responsibilities in managing roadside vegetation, under the *Local Government Act 1999* and *Native Vegetation Act 1991*
- clear guidelines for Council to undertake activities near roadsides, in accordance with legislative requirements and best practice.

The aim of the RVMP is to assist the Council:

- to strategically manage and enhance biodiversity along roadsides
- to understand its legal requirements for the protection of roadside vegetation whilst ensuring a safe transport network
- to clearly identify, from a works perspective, what can/cannot be done within roadside vegetation.

Under the Guidelines for the Management of Roadside Native Vegetation and Regrowth Vegetation, a RVMP can be developed by local councils if they are required to operate outside of the parameters set out in these guidelines (i.e., for clearance within the primary envelope, secondary envelope, or verge). RVMPs require endorsement by the Native Vegetation Council (NVC) under the *Native Vegetation Act 1991* to fulfil the legal requirements under Native Vegetation Regulation 11(23).

The RVMP applies to road works (maintenance or minor construction) and other uses of roadsides such as service provision, pest animal and plant control, property access and bushfire protection. It does not apply to major construction projects involving the disturbance of roadside vegetation; such works require separate approval from the NVC.

This RVMP is to provide Council with a consistent and integrated approach to managing roadside vegetation and will be a working reference document for council staff. It will be made publicly available on Council's website and for viewing at Council's main office. Copies will be distributed to relevant council staff and Elected Members.

THE IMPORTANCE OF ROADSIDE VEGETATION

Roadside vegetation refers to the strip of vegetation growing between the road formation and the boundary of the road reserve, which is usually also the boundary of the adjacent property.

The legacy of clearance in South Australia means that a disproportionately high amount of remnant native vegetation occurs on roadsides and in road reserves, especially in the agricultural zone. In some areas, roadside vegetation is virtually the only remaining example of the original vegetation.

Roadside vegetation is important because it:

- contains remnants of the original vegetation
- provides important habitat for native wildlife (e.g., old trees with hollows, refuge from grazing disturbance)
- supports threatened vegetation communities and populations of conservation significant plant species
- provides an important corridor linking blocks of native vegetation and facilitating the movement of wildlife through the landscape (particularly birds)
- provides a valuable food source for pollinators
- provides a source of seed for revegetation projects
- provides a shelter belt for neighbouring properties, and
- provides social benefits (e.g., aesthetic and amenity value).

Roadside vegetation also has benefits for road maintenance and safety as it can:

- provide shelter from wind
- provide shade from sun glare
- help to define curves in roads
- enhance driver alertness
- lower local water tables that may affect the road formation
- reduce the velocity of water run-off, in turn reducing scour and erosion
- stabilise batters and embankments, and
- prevent weeds becoming established.

ABOUT OUR DISTRICT

The Barossa Council covers 912 square kilometres and is located 80 kilometres (km) north-east of Adelaide. Council supports a population of approximately 24,000. It encompasses six major towns, Mount Pleasant, Angaston, Nuriootpa, Tanunda, Lyndoch and Williamstown as well as 7 smaller towns and communities).

The traditional custodians of the Barossa region are the Peramangk, Ngadjuri and Kaurna Nations. Colonel William Light first visited the area in 1837, naming the Barossa Range from which the region derives its name. The settlement of the Barossa region began from 1839, with settlers mainly originating from England and Scotland, and then from 1842, from Prussia and Silesia.

Viticulture, agriculture, and forestry are major industries. The district is renowned as a premier tourism destination for wine and food. Other drawcards include recreational trails, three reservoirs and conservation parks, and historical points of interest.

An estimated 12% of the original native vegetation cover remains in Council. Remnants of native vegetation occur as fragmented patches on private and public land, and along roadsides (Figure 1). The remaining natural vegetation underpins the visual appearance and biodiversity of the area. The vegetation is further described in Section 3 Roadside Vegetation.

Interim Biogeographic Regionalisation for Australia (IBRA), a landscape-based classification of the land surface, divides Council into two IBRA regions, reflecting the environmental influences which shape the occurrence of flora and fauna. The IBRA regions are further split into three IBRA sub-regions and eight environmental associations, as shown in Figure 2 and detailed in Figure 3.

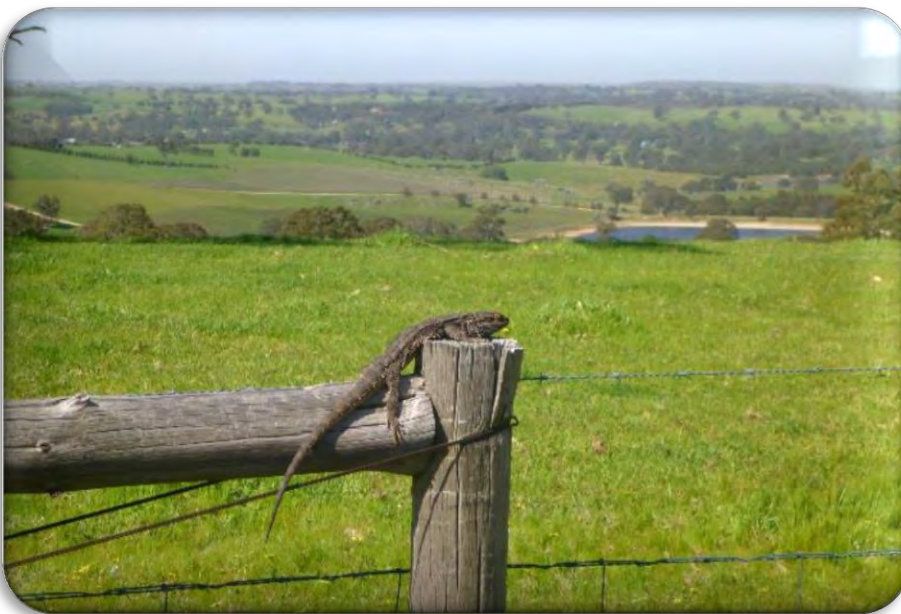


Photo: Bearded dragon (*Pogona barbata*) on roadside fence line with Barossa landscape in background.

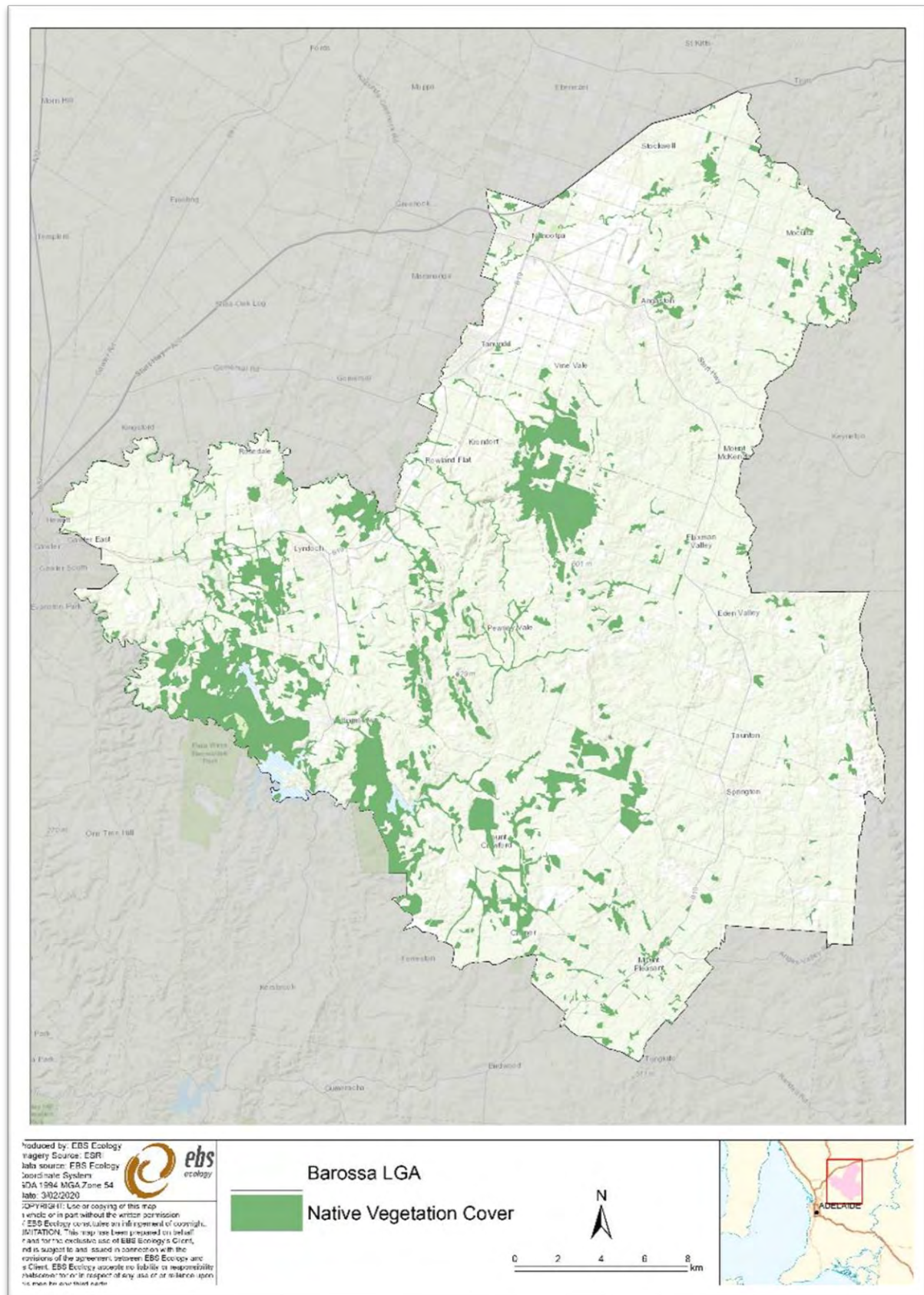


Figure 1: Native vegetation cover within The Barossa Council Local Government Area (LGA).

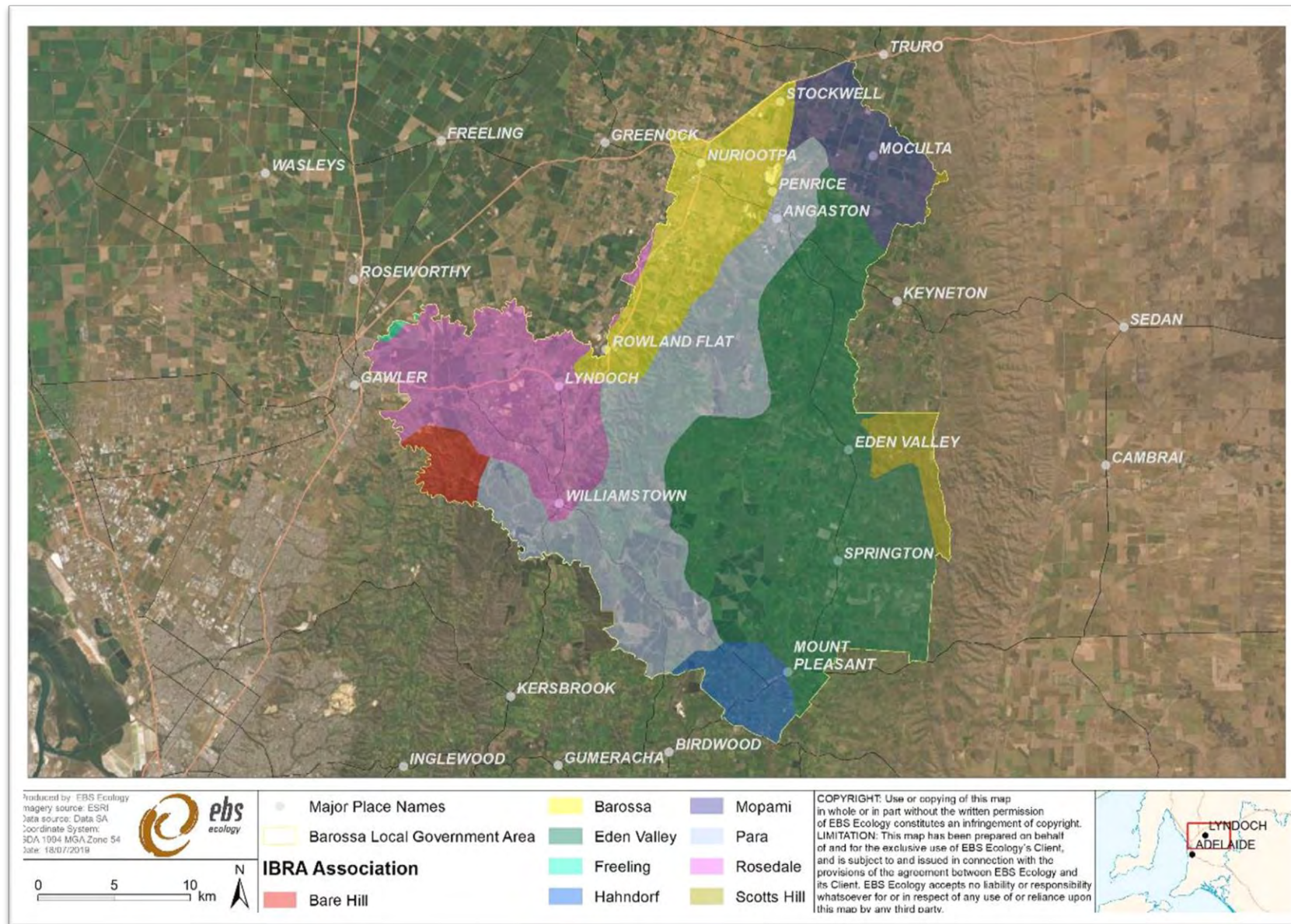


Figure 2: IBRA Associations within the Barossa LGA.

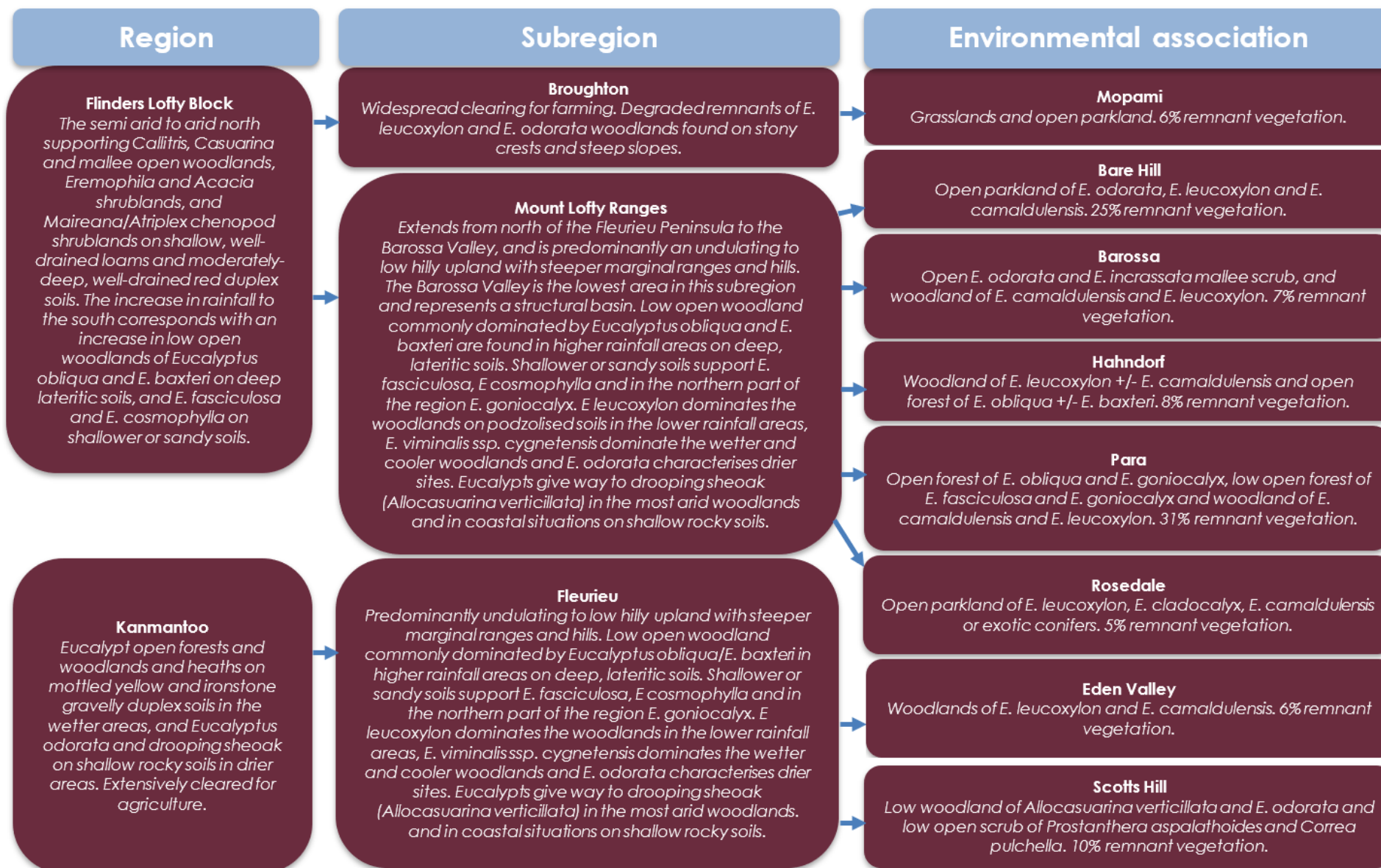


Figure 3: IBRA classifications within The Barossa Council.

COUNCIL'S RESPONSIBILITY FOR MANAGING ROADS

Based on the state-wide road spatial dataset, a total of 2663 km of road reserve is located within the council area. This comprises 538 km of sealed road and 2124 km of unsealed road.

According to the Infrastructure Asset Management Plan, Council, under the *Local Government Act 1999*, is responsible for 904 km of sealed and unsealed road.

Council maintains a [Public Road Register](#), identifying each road by name and category, which assists the prioritisation of resources for their effective management and maintenance. Council uses Conquest asset management software system for the management and reporting of its road and other assets data. Council has an annual plan to re-seal, regrade and re-sheet roads. Otherwise, road maintenance works are generally on an ad-hoc and reactive basis.

COUNCIL'S RESPONSIBILITY FOR MANAGING ROADSIDE VEGETATION

Council is committed to protecting biodiversity and achieving thriving ecosystems that support native flora and fauna. Specific goals with respect to roadside vegetation are to:

- maintain and enhance the species and genetic diversity, vegetation associations and habitat types currently occurring within existing roadside vegetation
- maintain and enhance the habitat and corridor value for indigenous flora and fauna
- minimise the adverse impacts of activities occurring within the roadside vegetation corridor
- clearly identify unauthorised activity in road reserves, and
- improve the awareness of roadside vegetation management issues for Council staff and contractors, the community and other authorities.

The RVMP aligns with and is supported by other Council plans, policies and By-Laws (Table 1).

Council has Standard Operating Procedures (SOPs) for road maintenance and road construction. The establishment and enforcement of SOPs will enable Council to have better control of activities that occur in roadside vegetation areas by agencies and authorities other than Council. Council has approval forms for specific activities, e.g. application for construction or modification on council property.

Table 1: Relevant Council Plan and Policies

Type	Level	Relevance
Plan		
Community (Strategic) Plan (2020)	Aspirational	Support sustainable farming while protecting the unique natural environmental and biodiversity of the region.
Corporate Plan (2022-2023)	Strategic	Maintain and seek to expand Council initiated native conservation and land management initiatives. Apply development policies to protect places of environmental value and significance.
Asset Management Plan – Infrastructure (TBC 2020-2030)	Operational	Minimisation of environmental impact through modern construction techniques and compliance requirements.
Community Land Management Plans	Operational	Provides a framework for Council to manage and develop community land, which may include road reserves.
Policy		
Policy 15.1 Access – Private Property	Operational	<i>Access – Private Property.</i>
Policy 15.22 Roads and Streets – Slashing and clearing road of verges	Operational	<i>Indigenous Roadside Vegetation, Significant Roadside Vegetation, Road Maintenance and Construction, Pest Plants.</i>

Type	Level	Relevance
Policy 15.16.1 Roadside Timber Collection	Operational	<i>Collection of timber.</i>
By-Law		
By-Law No-4 – Local Government Land	Operational	<i>For the management and regulation of the use of and access to local government land vested in or under the control of the Council, including the prohibition and regulation of particular activities on local government land.</i>
Plan		
Site Protection Plan	Operational	Management of Roadside vegetation

2 LEGISLATIVE CONTEXT

Council is responsible for the provision and maintenance of a safe transport network under the *Local Government Act 1999*, whilst also ensuring the protection of roadside vegetation under the *Native Vegetation Act 1991*. Council and the Department for Infrastructure and Transport (DIT), as the authorities responsible for road maintenance, need to be able to manage roadside vegetation to allow for the safe movement of vehicles. Works with the potential to impact on roadside vegetation need to have regard for the relevant legislative requirements.

LOCAL GOVERNMENT ACT 1999

All work within the road reserve requires written authority from the Council under Section 221 of the *Local Government Act 1999*. This includes removal and disturbance of vegetation and the control of pest plants and animals.

The use of an unmade public road requires written authority from the Council under Section 222 of the *Local Government Act 1999*. This includes use for business purposes and activities such as grazing or cropping or for access to a property

NATIVE VEGETATION ACT 1991

In South Australia, under the *Native Vegetation Act 1991*, all clearance of native vegetation requires the approval of the Native Vegetation Council (NVC) unless it is covered by a specific exemption contained within the *Native Vegetation Regulations 2017*.

'Native Vegetation' means plants indigenous to South Australia (and includes those intentionally sown or planted as a condition previously imposed or as declared by the NVC).

"Clearance", in relation to native vegetation, means:

- the killing, destruction, or removal of native vegetation
- the severing of branches, limbs, stems, or trunks of native vegetation
- the burning of native vegetation, and
- any other substantial damage to native vegetation, and includes the severing of roots, draining or flooding of land, or any other activity that causes the killing or destruction of native vegetation.

Under *Regulation 11(23) – Roadside or rail corridor vegetation management*, the clearance of vegetation on road reserves is permitted for the personal safety of those entering or passing the land, or of property on the land; or for controlling of pests on the land applicable to a roadside corridor. The clearance must comply with the NVC Guidelines for the Management of Roadside Native Vegetation and Regrowth Vegetation under Native Vegetation Regulation 11(23) and can only occur by someone acting on behalf of the person with the control and management of the land.

The NVC Guidelines for the Management of Roadside Native Vegetation and Regrowth Vegetation under Native Vegetation Regulation 11(23), endorsed 3 July 2019 pursuant to Section 25 of the *Native Vegetation Act 1991*, provide guidance for local councils. The 2019 [NVC Guidelines](#) allow greater capacity for local councils to undertake clearance of native vegetation regrowth up to 20 years of age (previously five years).

The NVC Guidelines clearly state the circumstances where approval is required by the NVC and how it is to be obtained. The NVC Guidelines also outline a pathway for clearing native vegetation that poses a safety concern and provide avenues for landholders who are adjacent to road reserves to manage vegetation in particular circumstances. A summary of the clearance pathways for clearance under applicable Native Vegetation Regulations can be found in the RVMP Operating Guidelines.

OTHER LEGISLATION RELEVANT TO ROADSIDE VEGETATION

The Commonwealth [Environment Protection and Biodiversity Conservation Act 1999](#) (EPBC Act) provides protection for nationally important flora, fauna, ecological communities, and heritage places – defined in the Act as Matters of National Environmental Significance (MNES). Threatened species and ecological communities listed under the EPBC Act are known to occur within Council road reserves. Under the EPBC Act, any action with potential to have a significant impact on a MNES requires assessment and Commonwealth approval.

Native plants and animals in South Australia are protected under the [National Parks and Wildlife Act 1972](#) (NPW Act). It is an offence to remove a native plant on a reserve, wilderness protection area, wilderness protection zone, land reserved for public purposes, a forest reserve, or any other Crown land, without a permit. Threatened plant and animal species listed on Schedules 7, 8, or 9 of the NPW Act are known to occur within the road reserve. Threatened ecosystems are not currently recognised under SA legislation.

The assessment of vegetation clearance applications under the *Native Vegetation Act 1991* considers the impact on threatened species and threatened plant communities.

Section 75A of the NPW Act provides defences to the charges of an offence under the *Native Vegetation Act 1991* or if acting in compliance with a requirement under the *Natural Resources Management Act 2004* or another Act.

The [Landscape South Australia Act 2019](#), provides for soil, land and water management, pest plant and animal control, and support for broader sustainable primary production programs. Council falls within the Northern and Yorke Landscape Board Region. The Landscape Board can provide advice in relation to the management of biodiversity and pest plants and animals.

Under the *Landscape South Australia Act 2019*, landholders have a responsibility to manage declared pest plants and animals and take reasonable steps to prevent land

and water degradation. The Northern and Yorke Landscape Board is responsible for ensuring the control of declared plants and animals on road reserves. Any costs incurred in carrying out this control work (by the Landscape Boards) may be charged to the adjoining landholder - up to the middle of the road reserve.

State planning reforms has seen the statewide *Planning and Design Code* replace all Development Plans to become the single source of planning policy for assessing development applications across the state.

The *Planning, Development and Infrastructure Act 2016* still requires two approvals, but native vegetation considerations will be 'up-front' in the development application process. This change will better align the two approval processes, use the same information reports, and ensure that design and siting to avoid and minimise the clearance of native vegetation is a fundamental part of the planning process.

Aboriginal sites and objects are protected by the *Aboriginal Heritage Act 1988*. It is an offence to damage, disturb or interfere with Aboriginal sites. Advice should be sought regarding road infrastructure projects, on the risk of impact to sites and the need for a heritage assessment. Addressing this early in the planning process will enable alternative options to be considered if sites are found. If burial sites or artefacts are uncovered during road works, work must stop immediately, and contact made with the relevant authority.

Other legislation which applies to the management of Roadside Vegetation includes but is not limited to: *Agricultural and Veterinary Products Act (Control of Use) 2002*, *Electricity Act 1996*, *Environment Protection Act 1993*, *Fire and Emergency Services Act 2005*, and *Road Traffic Act 1961*.



3 ROADSIDE VEGETATION OVERVIEW

An estimated 5% of the remaining native vegetation cover within Council is within road reserves. Vegetation types represented within the roadsides are shown in Table 2 - Grassland (44.22%) and Woodland (40.02%) are the dominant vegetation structural types.

Table 2: Roadside vegetation by structural type or other

Structural type	Roadside length (km)	% of total roadside
Woodland	766.11	40.02
Mallee	0.49	0.03
Shrubland	15.28	0.80
Sedgeland	0.64	0.03
Herbland	1.78	0.09
Grassland	846.47	44.22
Plantation	156.63	8.18
Bare ground	13.71	0.72
Built-up	113.15	5.91
Total	1914.26	100.00

Based on analysis of the DEW roadside vegetation spatial data (DEW 2019b).

Most areas of roadside vegetation have suffered disturbance, and many contain a high proportion of exotic species. Some sites in the higher, drier areas remain in excellent condition. Less than 1% of the roadsides contain remnant vegetation that isn't heavily weed infested, degraded, or cleared.

All remaining native vegetation is considered significant and important to the integrity and ongoing conservation of the biodiversity of the region. Roadsides provide an important network of "corridors", which combined with the remnant vegetation on private lands and that which is conserved in reserves, contributes significantly to the total biodiversity of the area.

ROADSIDE VEGETATION SURVEY

The following roadside surveys have been undertaken within the Council area, with a total 1840.09 km of roadside, 0.19 km of undeveloped road and 73.98 km of rail corridor surveyed:

- Barossa District Council (Subset 1 - Nov 1999)
- Mt Pleasant LGA (1998)
- Sturt Highway TSA Gawler - Truro (March 2001).

The previous Barossa District Council Survey (Playfair 2000) covered all the formed roads maintained by Council at the time of the survey.

These surveys are incorporated into the Department for Environment and Water's (DEW) roadside vegetation spatial layer. Roadside vegetation surveys follow a standard 'drive-by' rapid assessment methodology. The roadside survey coverage in relation to management authority is provided in Table 3.

Table 3: Roadside vegetation survey type and authority

Road authority	Survey type	Coverage (km)
Council	Standard Roadside Survey	1538.43
	Undeveloped Road Reserve Survey	0.19
State (DIT)	Standard Roadside Survey	301.67
	Railway Corridor Survey	73.98
Total		1914.26

Based on analysis of the DEW roadside vegetation spatial data (DEW 2019b).

In addition, a survey of undeveloped roads was undertaken by the Barossa Catchment Group between 2003-2007. Twenty sites were surveyed using DEW standard native vegetation survey methodology. This data is included in the Biological Databases of South Australia (BDBSA) but not in the DEW roadside vegetation spatial layer.

An additional survey has been undertaken at DIT and Council Roadside Marker Scheme (CRMS) sites.

Council utilises the "Roadside Vegetation Mapping - 10m offset" spatial (GIS) layer to consolidate the information collected during roadside vegetation surveys and includes detailed attribute information such as broad vegetation structural formation, vegetation association type, condition, density of understorey, dominant species, major weeds, major disturbances, conservation rating and description of overall significance.

ROADSIDE MARKER SCHEME

The Roadside Marker Scheme (RMS) is an important and valuable means of identifying, managing, and protecting important areas of roadside vegetation. RMS sites are identified by small blue marker signs with a unique identification number, at the start and end of important areas. The marker system ensures that those involved in road related works (e.g., road upgrades, maintenance, and pest control programs) are aware of the location of these sensitive roadside areas, thereby protecting them from disturbance.

RMS sites along state roads are established and managed by DIT. Nine DIT managed RMS sites are in Council area, totalling 10.2 hectares (ha).

Council RMS sites are those that are established and managed by along council roads and are herein referred to as CRMS sites. 82 CRMS sites were established in 2004-2005. These sites were based on the recommendations, with sites typically incorporating native vegetation of high conservation significance (Category A and B). The sites combined cover over 100 km of developed roadsides (Figure 4).

The CRMS sites were first surveyed in 2009-2010 and re-surveyed for Council by EBS Ecology (EBS) in 2019 using the NVC Bushland Assessment Methodology

There are six established Trees for Life (TFL) Bush for Life (BFL) sites across the Council area, some being located within CRMS sites.

It is recommended that all areas identified as Management Category A or B or known to contain threatened species should be marked using the RMS system. A drive-by

survey was conducted in 2019, of a sub-set of such areas falling outside the current CRMS, to inform priorities for new CRMS sites. The contractor recommended some existing CRMS sites be discontinued due to poor condition.



Photo: Example of Council RMS site blue marker peg.

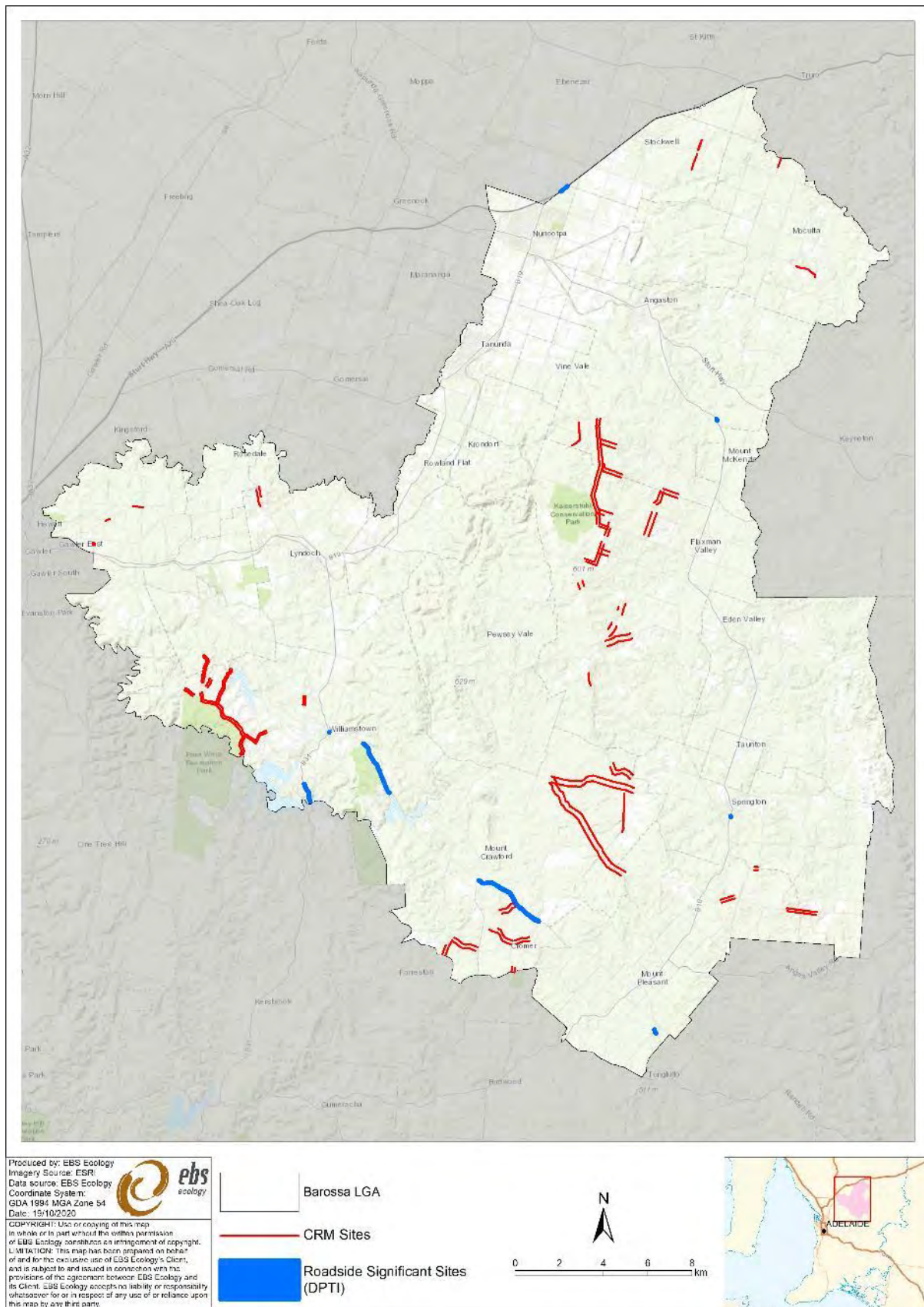


Figure 4: Location of Council and DIT RMS sites.

ROADSIDE VEGETATION DATABASE

The “Roadside Vegetation Mapping - 10m offset” spatial layer is planned to be accessible via Council's GIS system in the future. This will be used to assist the management of roadside vegetation and planning of works.

A Council RMS site database (Excel, GIS compatible) was established in 2019. The CRMS site database consolidates all the available information for the CRMS sites enabling Council to:

- compare survey results (within and between sites) to monitor site trends
- identify sites containing significant species
- identify sites containing declared/problem weeds
- identify weed outbreaks
- compare the condition and significance of sites
- determine priority sites for management
- advise contractors working in the road reserve of sensitive areas, and
- record and keep track of site management actions.

Photographs are available for each site, from each survey period.

DIT manages a [Roadside Significant Sites Database](#) related to RMS sites on state managed roads. The DIT [roadside significant sites spatial layer](#) is publicly available. Site specific survey data (i.e., species lists) may be available on request from DIT.

Any new information collected by Council should be fed back to DEW for inclusion in the state BDBSA and roadside vegetation spatial dataset.



Photo: *Callitris* Woodland roadside vegetation.

VEGETATION DESCRIPTION

VEGETATION ASSOCIATIONS

The DEW roadside vegetation data recognises 73 vegetation associations along roadsides in Council's area. For this plan, these were condensed into twenty vegetation associations, based on dominant overstorey type.

Table 4 lists the broad associations, the length of roadside they occupy, and their conservation significance rating, while Table 5 shows the conservation rating descriptions. Figure 5 shows the location of the broad vegetation associations.

Dominant overstorey species include *Eucalyptus camaldulensis* (River Red Gum), *Eucalyptus leucoxylon* ssp. *leucoxylon* (SA Blue Gum), *Eucalyptus viminalis* (Manna Gum), *Eucalyptus odorata* (Peppermint gum), *Eucalyptus goniocalyx* (Long leaf box), *Eucalyptus fasciculosa* (Pink Gum) and *Eucalyptus obliqua* (Messmate stringybark).

Exotic grassland was the most dominant vegetation association, covering over 40% of the surveyed roadside. *Eucalyptus camaldulensis* +/- *Eucalyptus leucoxylon* Woodland was the dominant treed association, covering 23% of the surveyed roadside. Woodland dominated by *Eucalyptus odorata* was assigned the highest conservation rating and comprised 4% of the assessed roadside.

Table 4: Informal conservation rating for roadside vegetation associations

Broad vegetation association	Conservation rating (bold represents dominant rating)	Roadside length (km)	% of roadside surveyed
<i>Acacia</i> spp. Shrubland	Moderate - High	12.41	0.65
<i>Allocasuarina verticillata</i> Woodland	Moderate - High	2.04	0.11
<i>Callitris gracilis</i> Woodland	Moderate - High	7.03	0.37
<i>Eucalyptus camaldulensis</i> +/- <i>Eucalyptus leucoxylon</i> Woodland	Moderate - High	440.29	23.00
<i>Eucalyptus fasciculosa</i> +/- <i>Eucalyptus leucoxylon</i> Woodland	Moderate	16.18	0.85
<i>Eucalyptus goniocalyx</i> Woodland	Very High	32.23	1.68
<i>Eucalyptus largiflorens</i> / <i>Eucalyptus leucoxylon</i> +/- <i>Callitris gracilis</i> Woodland	High	2.07	0.11
<i>Eucalyptus leucoxylon</i> +/- <i>Eucalyptus camaldulensis</i> / <i>Allocasuarina verticillata</i> / <i>Callitris gracilis</i> Woodland	Moderate - High - Very High	4.84	0.25
<i>Eucalyptus leucoxylon</i> Woodland	Moderate - High - Very High	116.98	6.11
<i>Eucalyptus obliqua</i> Woodland	Moderate	3.47	0.18
<i>Eucalyptus odorata</i> +/- <i>Eucalyptus</i> spp. Woodland	High - Very High	67.52	3.53
<i>Eucalyptus porosa</i> Woodland	High	0.82	0.04
<i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> +/- <i>Eucalyptus leucoxylon</i> Woodland	High	69.69	3.64
<i>Juncus acutus</i> Sedgeland	Low	0.20	0.01
<i>Senna artemisioides</i> ssp. Shrubland	Moderate	0.10	0.01
Exotic Grassland +/- Herbland	Nil	808.80	42.25
Mixed Plantation	Moderate - Nil	61.75	3.23
Mixed Grassland	Moderate - High - Very High	41.14	2.15
Native Plantation	Low - Nil	102.44	5.35
Urban / Bare Ground	Nil - Not relevant	104.18	5.44
Not assessed		20.09	1.05
Total		1914.26	100.00

Based on analysis of DEW roadside vegetation spatial data (DEW 2019b).

Table 5: Conservation priority rating of roadside vegetation within Council area

Conservation priority rating	Conservation rating description	Roadside length (km)	% of roadside
Very High (1)	Includes any associations whose Conservation Status was identified by Neagle (1995) as Poor or Nil; typically includes associations that are most extensively cleared and/or most degraded.	111.67	5.83
High (2)	Includes associations whose Conservation Status was identified by Neagle (1995) as either Moderate or Reasonable; typically includes associations that are moderately cleared; may include mixed native vegetation that includes significant species in the overstorey.	90.96	4.75
Moderate (3)	Includes relatively common associations whose Conservation Status was identified by Neagle (1995) as either Reasonable or Excellent; may include mixed native vegetation that contains common species in the overstorey.	650.76	34.00
Low (4)	May include some mixed native +/- alien vegetation that cannot be categorised readily into a formal association type.	99.96	5.22
Nil (5)	of no conservation significance, very little or no native vegetation.	939.03	49.05
Not Relevant (9)	Conservation Significance Not Relevant; area is Built-up or Bare Ground.	1.79	0.09
Not assessed		20.09	1.05
Total		1914.26	100.00

Based on analysis of DEW roadside vegetation spatial data (DEW 2019b).

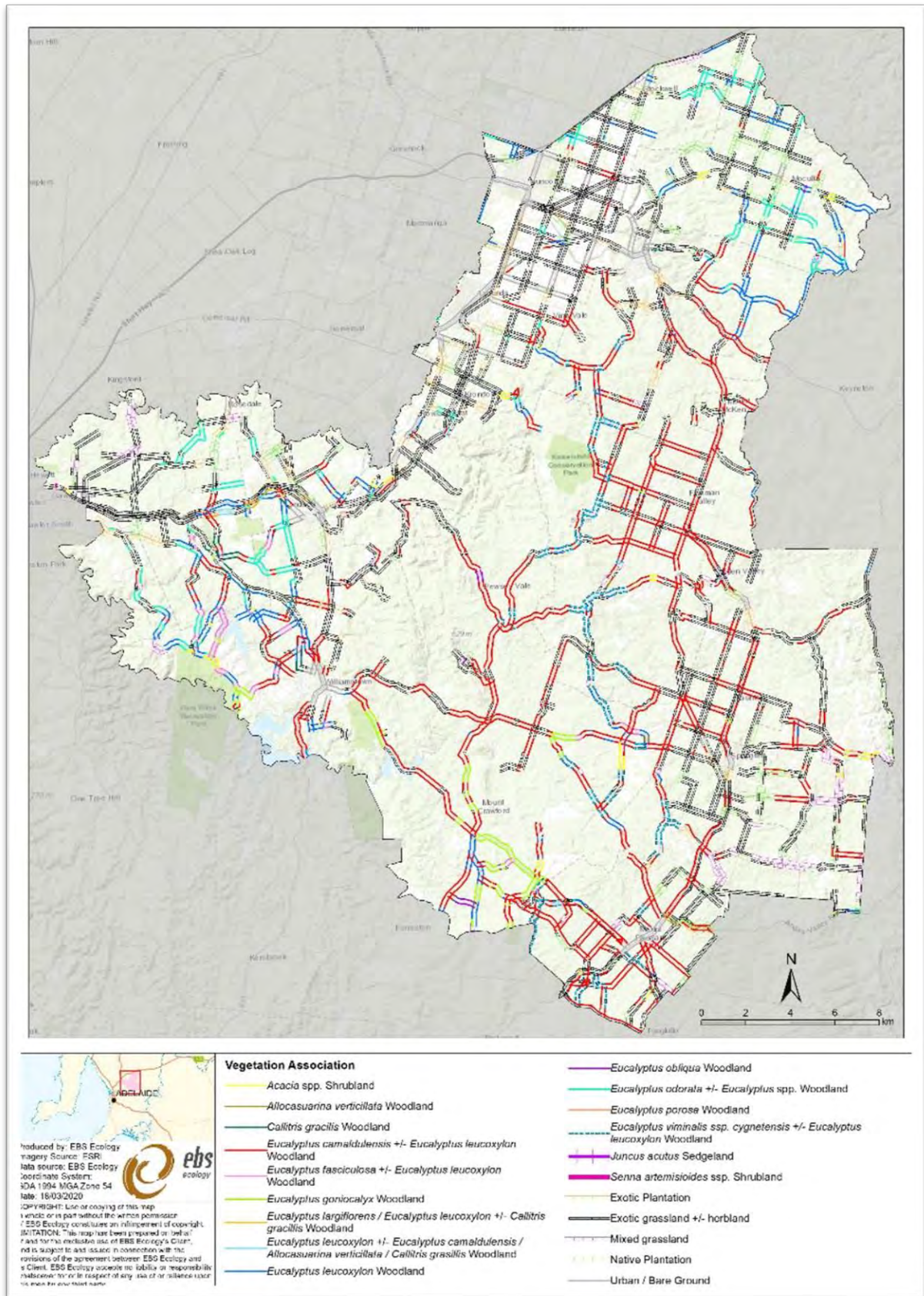


Figure 5: Overview of roadside vegetation across the Council, classified by broad vegetation association.

VEGETATION CONDITION AND SIGNIFICANCE

The roadside vegetation across the Council area has mostly been heavily invaded by exotic plants, as well as suffering from some form of human disturbance. The vegetation in the best condition covers the least length of roadside, and vegetation in the worst condition covers the most length of roadside. Only a small amount (0.5%) is undisturbed and lacking in exotic species. Less than 2% is considered to represent a pre-European settlement vegetation condition (Table 6, Figure 7).

Table 6: Overview condition rating of roadside vegetation within Council area

Overview condition rating for the road segment	Overview condition rating description	Length of surveyed roadside (km)	% of roadside
Excellent (1)	Very little or no sign of alien vegetation in the understorey*; resembles probable pre-European settlement vegetation condition.	9.93	0.52
Good (2)	High proportion of native species and native cover in the understorey*; reasonable representation of probable pre-European settlement vegetation condition.	22.41	1.17
Moderate (3)	Substantial invasion of aliens, but native understorey* persists; for example, may be a low proportion of native species and high native cover, or high proportion of native species and low native cover.	56.16	2.93
Poor (4)	The understorey* consists predominantly of alien species, although a small number of native species persist.	166.66	8.71
Very poor (5)	The understorey* consists only of alien species.	1543.42	80.63
Not relevant (9)	Condition is not relevant as area is Built-up or Bare ground.	60.15	3.14
Not assessed		55.54	2.90
Total		1914.26	100.00

Based on analysis of DEW roadside vegetation spatial data (DEW 2019b).

* Or all strata if upper and lower strata are difficult to distinguish e.g., grasslands, sedgeland, low shrublands.

Each roadside segment surveyed has been given a conservation priority rating for the vegetation association (Figure 6). These two attributes combined, determine the condition rating (Figure 7) and overall ecological significance rating assigned to the roadside segments (Figure 8) (refer to Stokes et al. 2006 for methodology). The overall ecological significance (A, B, C, D, E) provides a simple summary of the relative ecological value of the vegetation in each segment.

41 roadside segments (totalling 19.8 km – 1% of roadside) were considered overall significance category A, and a further 134 segments (totalling 48.2km – 2.5% of roadside) were considered overall significance category B. In relation to Council roads only, approximately 52 km of roadside vegetation was considered as being of high overall ecological value (Category A and B), representing 2.7% of the total surveyed roadside length (Table 7).

Table 7: Overall ecological significance of roadside vegetation within TBC area

Overall significance code	Overall ecological significance category description	Length of roadside (km)			% of surveyed roadside
		Council	State (DIT)	Total	
A	Contains a high priority vegetation association in excellent or near excellent condition.	11.64	8.18	19.82	1.04
B	Contains a high priority vegetation association in moderate condition or a lower priority association in excellent condition.	40.12	8.12	48.24	2.52
C	Contains a high priority vegetation association in poor condition or a lower priority vegetation association in moderate condition.	115.84	14.20	130.04	6.79
D	Contains limited native vegetation in poor condition.	556.35	96.69	653.04	34.11
E	Very little or no native vegetation present.	759.27	188.15	947.42	49.49
Not relevant	Not relevant for overall significance. Area is either built-up or bare ground.	55.39	60.30	115.69	6.04
Total		1538.61	375.65	1914.26	100.00

Based on analysis of DEW roadside vegetation spatial data (DEW 2019b).

The condition of the vegetation at CRMS sites was scored in 2019 as part of the Bushland Assessment Methodology (BAM) assessment. The BAM condition score is calculated based on positive vegetation attributes (e.g. species diversity, regeneration, native plant life forms, fallen timber/debris and hollow-bearing trees) and negative vegetation attributes (e.g. weeds), compared to a benchmark community – refer to the [BAM manual](#). The higher the score, the higher the vegetation condition. The condition scores of CRMS sites are shown in Figure 9.

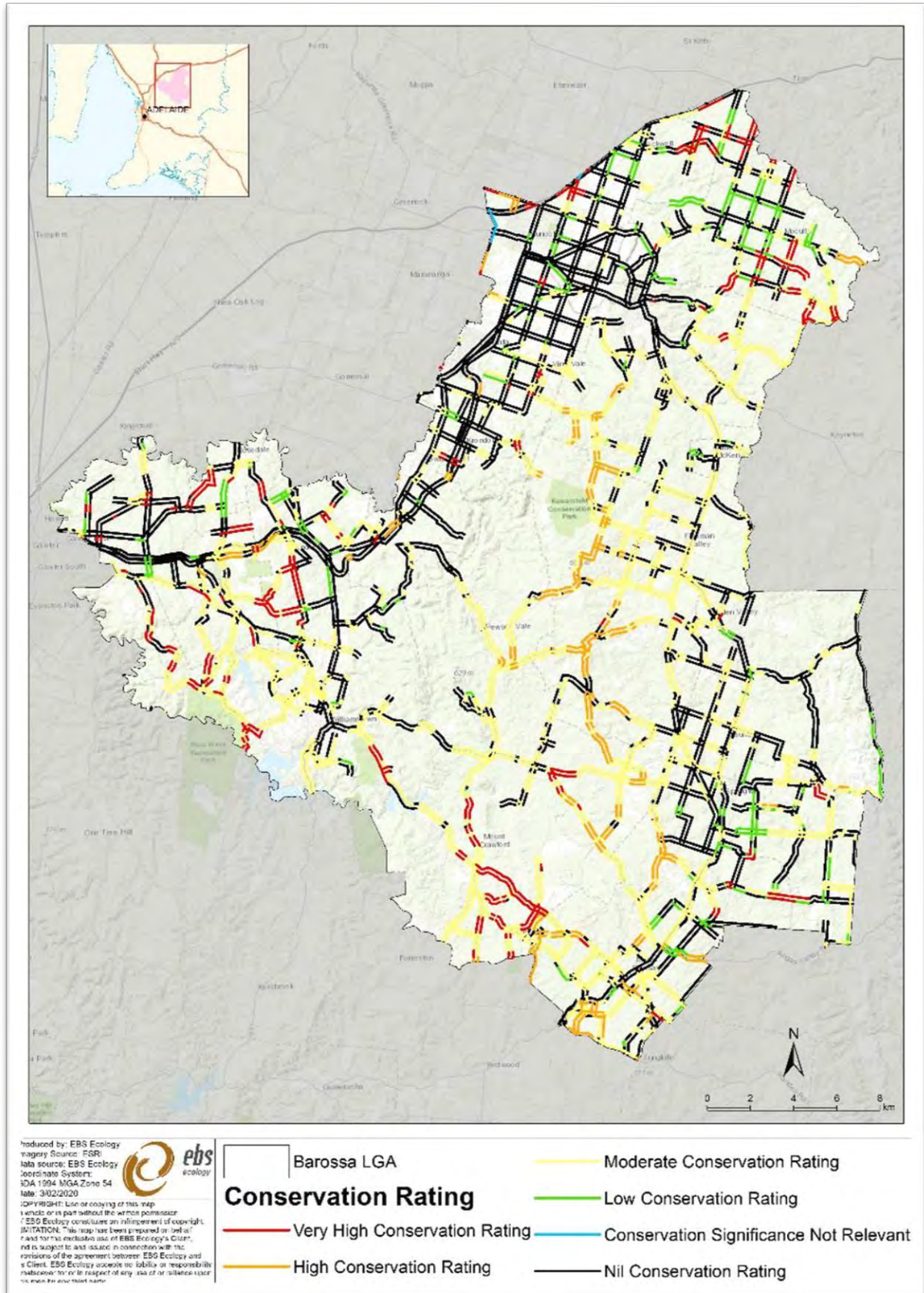


Figure 6: Overview of conservation priority rating of roadside vegetation across the Council.

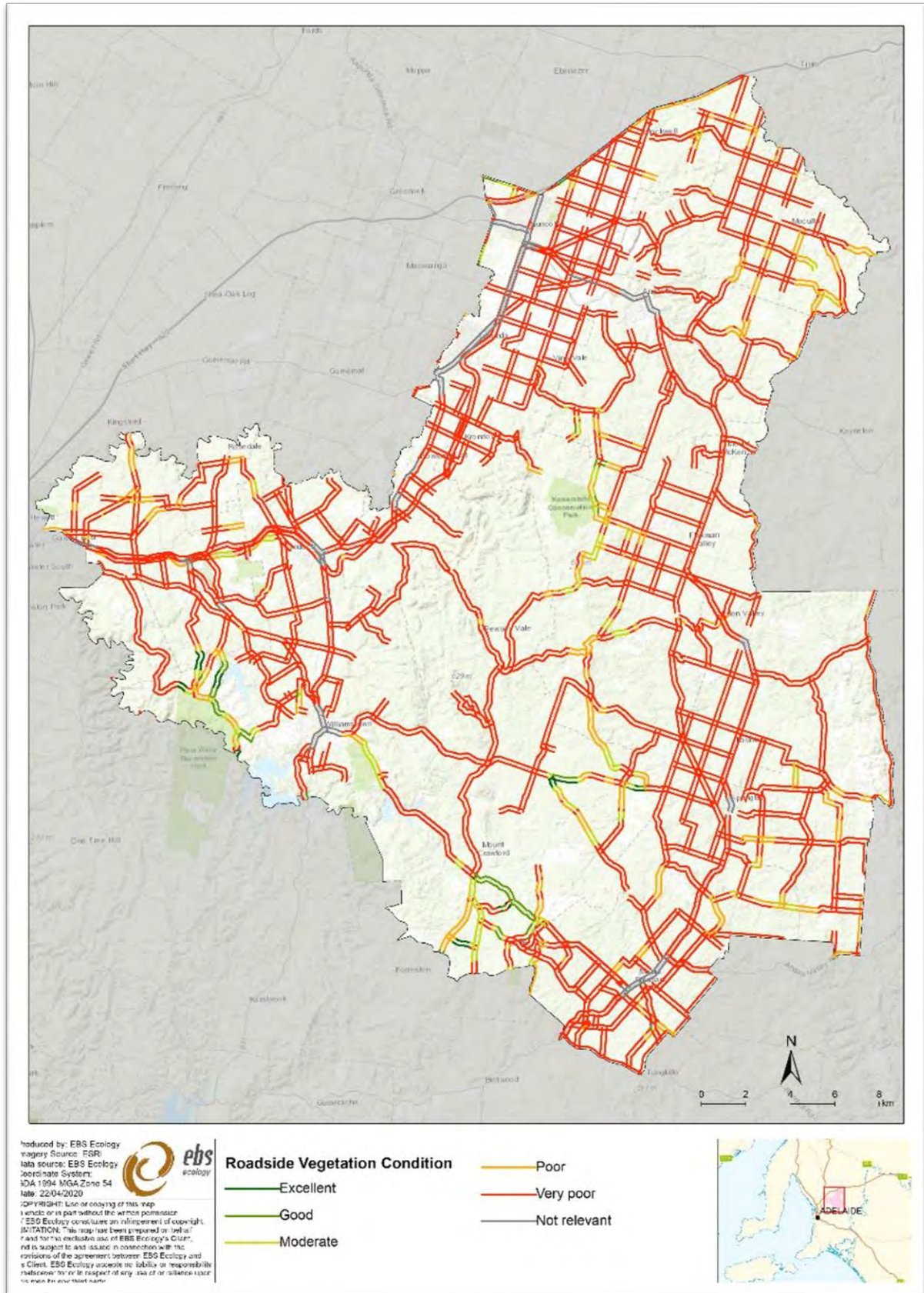


Figure 7: Overview of condition rating of roadside vegetation across the Council.

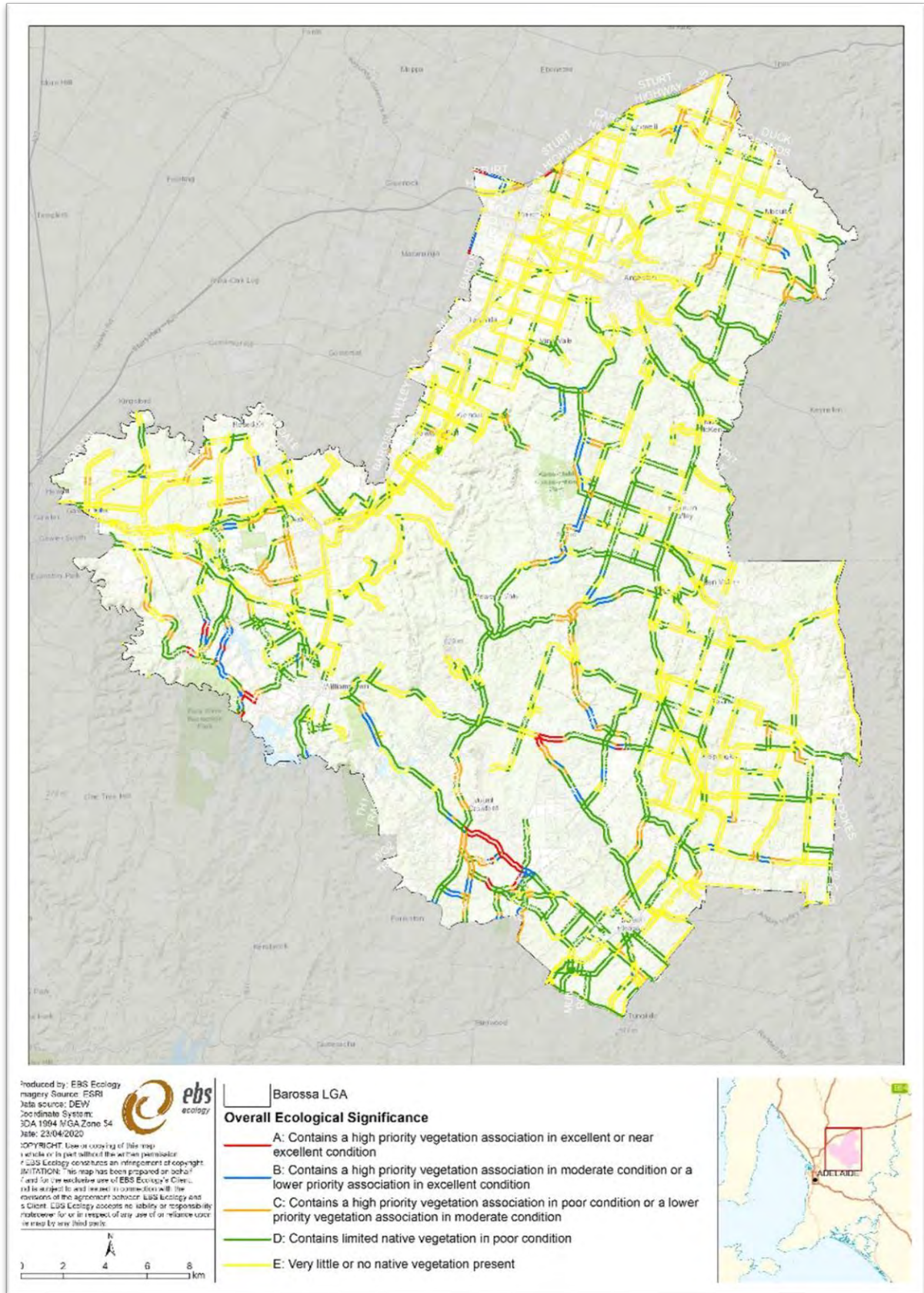


Figure 8: Overall ecological significance of roadside vegetation.

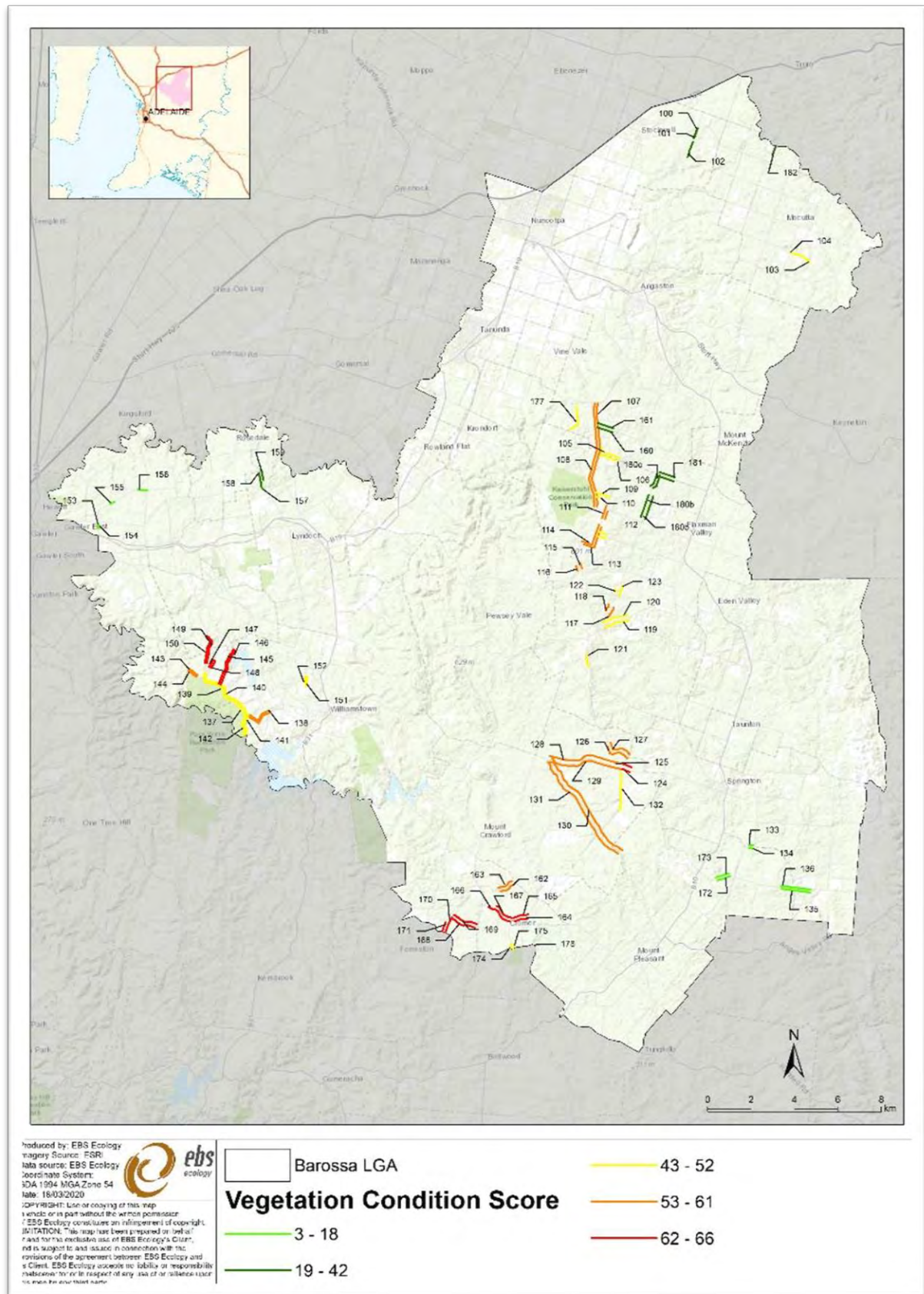


Figure 9: Vegetation condition score of CRMS sites, as determined from 2019 survey results using Bushland Assessment Methodology.

VEGETATION MANAGEMENT CATEGORIES

The surveyed roadside vegetation has been categorised into five management categories (A to E) as outlined in Table 8. The vegetation management categories relate almost directly to the overall ecological significance ratings of A to E, except road segments with an overall ecological significance rating of C and a minimum condition rating of 1 or 2, were elevated to management category B. The result was an additional 5 road segments (totalling 1.8 km) from overall ecological significance category C being included in vegetation management category B.

Roadside vegetation management categories are shown in Figure 10. This, and Council's roadside vegetation spatial dataset, should be used to check the management category of roadside vegetation as a first step in planning road related works.

Table 8: Roadside vegetation management categories

A	Should not be disturbed; contains a high priority vegetation association in excellent or good condition.
B	Should not be disturbed; contains a high priority vegetation association in moderate condition or a lower priority association in excellent condition.
C	Disturbance should be avoided wherever possible; contains a high priority vegetation association in poor condition or a lower priority association in moderate condition.
D	May be disturbed - subject to further assessment and planning; contains limited native vegetation in poor condition.
E	May be disturbed - very little or no native vegetation present.

Note: Even though some categories "may be disturbed", this only means that disturbance of areas without native vegetation can occur, e.g., soil disturbance, and compaction by machinery or other means. Native vegetation in all categories (even D and E) must not be cleared, unless specifically outlined in this plan.

ROADSIDE VEGETATION MANAGEMENT MATRIX

The roadside vegetation management matrix (Table 9) can be used as a guide by anyone undertaking activities that may impact on roadside vegetation. It indicates what activities are allowable within the different management categories of roadside vegetation. This will help avoid any unintended damage to roadside vegetation.

Photo: CRMS site in proximity to drain and vineyards.



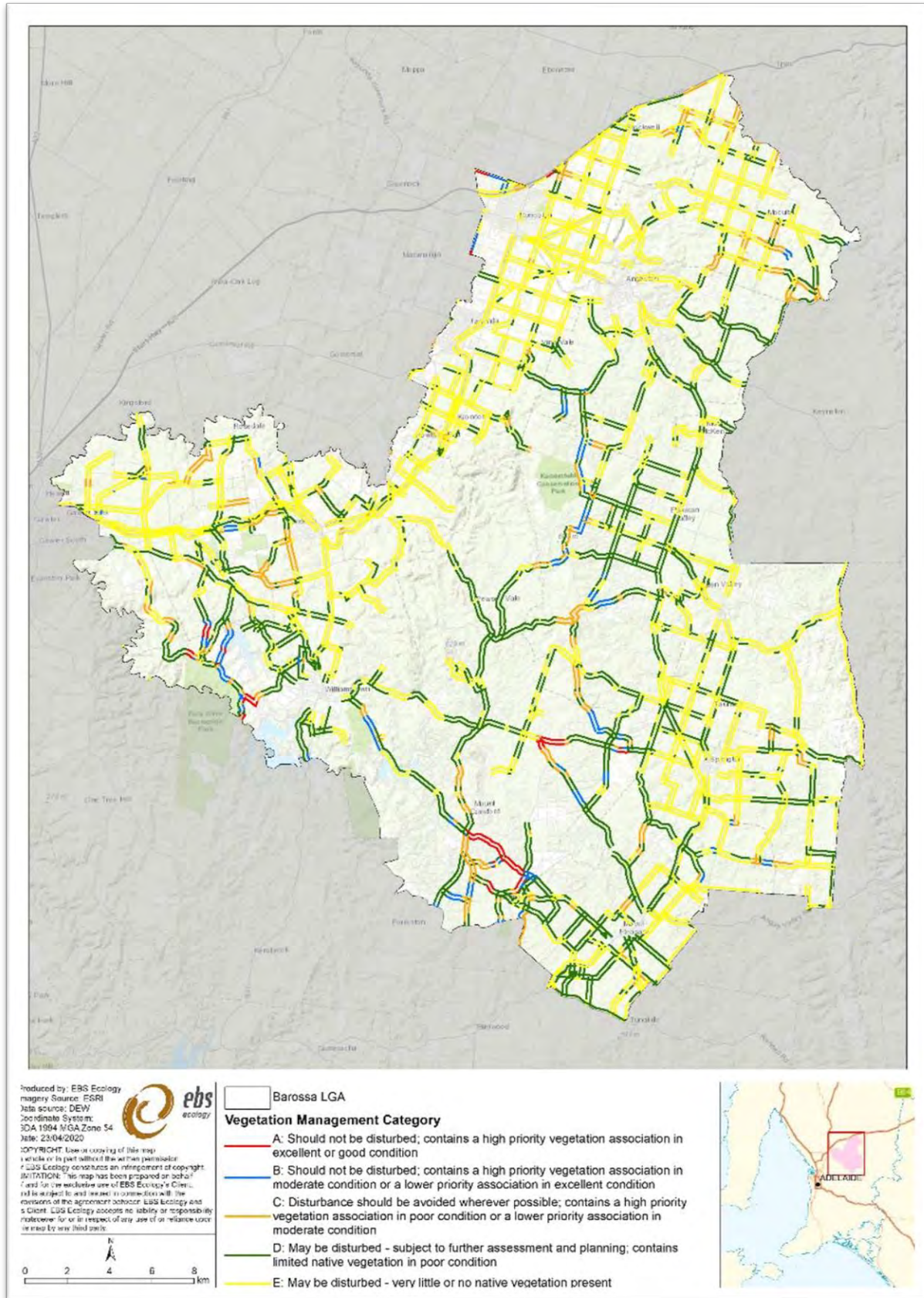


Figure 10: Roadside vegetation management categories.

Table 9: Roadside vegetation management matrix based on vegetation management category

*Note – a number of the restrictions for management category A may not be applicable depending on the pavement type i.e., sealed vs unsealed

	Management Category				
DEFINITION	A*	B	C	D	E (generally devoid of native vegetation)
Value	VERY HIGH value	HIGH value	HIGH value	MODERATE value	LOW value
Restrictions	Many restrictions apply	Restrictions apply	Restrictions apply	Some restrictions apply	Few restrictions apply
Activity	Roadside Management Restrictions				
GENERAL	AVOID ALL disturbance outside shoulder	AVOID ALL disturbance outside shoulder	LIMIT disturbance outside shoulder to designated sites	LIMIT disturbance outside shoulder to designated sites	MINIMISE general disturbance outside shoulder
Site marking	Mark and list on register of roadside significant sites	Mark and list on register of roadside significant sites	Not marked unless rare species present	Not marked unless rare species present	Not marked
Stockpiling	NOT PERMITTED	AVOID	AVOID	Select site with care	No restrictions
Borrow pits	NOT PERMITTED	AVOID	AVOID	Select site with care	No restrictions
Clearing table drains (sealed roads)	DO NOT spray or grade	DO NOT grade Selectively spray	DO NOT grade Selectively spray	DO NOT grade Selectively spray	LIMIT grading or spraying if possible
Clearing table drains (unsealed)	DO NOT place grading rill outside pavement. Keep clear of drain.	DO NOT place grading rill outside pavement. Keep clear of drain.	DO NOT place grading rill outside pavement. Keep clear of drain.	DO NOT place grading rill outside pavement. Keep clear of drain.	DO NOT place grading rill outside pavement
Shoulder widening	AVOID	AVOID	LIMIT	LIMIT if possible	No Restrictions
Shoulder maintenance (sealed roads)	REMOVE grading spoil Spray with caution (limit to furniture)	REMOVE grading spoil Spray with caution (limit to furniture)	REMOVE grading spoil Spray with care (limit to furniture)	REMOVE grading spoil Spray with care	No Restrictions
Drain turn outs (sealed roads)	DO NOT GRADE Cut or excavate only Get approval for new drains	DO NOT GRADE Cut or excavate only	DO NOT GRADE Cut or excavate only	MINIMISE GRADED TURN OUTS	MINIMISE graded turnouts wherever possible
Drain turn outs (unsealed roads)	Only where necessary MINIMISE DISTURBANCE	Only where necessary MINIMISE DISTURBANCE	No restrictions MINIMISE DISTURBANCE	No restrictions MINIMISE DISTURBANCE	No Restrictions MINIMISE DISTURBANCE
Vegetation control (sealed roads)	S.O.P including LIMIT to 0.5m guidepost offset REMOVE pruning debris DO NOT spray or grade	S.O.P incl. LIMIT to 0.5m guidepost offset REMOVE pruning debris DO NOT spray or grade	S.O.P. incl. LIMIT to 0.5m guidepost offset REMOVE pruning debris DO NOT spray or grade	S.O.P. incl. LIMIT to 1.0m guidepost offset SCATTER pruning debris in open areas – do not pile up DO NOT GRADE	No Restrictions
Off road access	AVOID - all access off the	AVOID - all access off the	LIMIT access off the road	LIMIT access off the road	No restrictions

	Management Category				
DEFINITION	A*	B	C	D	E (generally devoid of native vegetation)
Value	VERY HIGH value	HIGH value	HIGH value	MODERATE value	LOW value
Restrictions	Many restrictions apply	Restrictions apply	Restrictions apply	Some restrictions apply	Few restrictions apply
Activity	Roadside Management Restrictions				
(parking, turning, detour)	road formation	road formation	formation to previously disturbed sites	formation to previously disturbed sites	
Rubbish dumping	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED
Parking bays	NOT PERMITTED	AVOID	AVOID	Select disturbed sites	No restrictions
Service installation	AVOID	AVOID	AVOID	Select degraded site Subject to S.O.P.	No Restrictions
Service maintenance	LIMIT disturbance to a minimum & prepare site protection plan. Subject to S.O.P. No vehicle access	LIMIT disturbance to a minimum & prepare site protection plan. Subject to S.O.P. No vehicle access	LIMIT disturbance to a minimum & prepare site rehabilitation plan. Subject to S.O.P. No vehicle access	Rehabilitate sites. Subject to S.O.P. No vehicle access	Rehabilitate sites
Pest plant control	Subject to S.O.P. e.g. TARGETED removal by Bushcare specialist contractor only	AVOID - control of weeds only	Subject to S.O.P. Spot spraying of target species	Subject to S.O.P. Spot spraying of target species	No restrictions
Fertiliser/herbicide drift	Alert landholder	Alert Landholder	Alert Landholder	Alert Landholder	Alert Landholder
Fenceline/clearance	MINIMISE disturbance	MINIMISE disturbance	MINIMISE disturbance	No restrictions	No restrictions
Access to adjoining land	AVOID	AVOID	LIMIT to previously disturbed sites	LIMIT to previously disturbed sites	No restrictions
Bushfire protection	Control of weeds only	AVOID - Control of weeds only	Subject to S.O.P. AVOID / slash breaks in essential areas	Subject to S.O.P. Slash breaks in preference to grading	No restrictions
Stock grazing	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	AVOID
Stock movement	AVOID	AVOID	AVOID	Permit only, subject to conditions (MOVE quickly, clean vehicles)	No restrictions
Firewood collection	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED
Revegetation	AVOID	AVOID	AVOID	Reinforcement planting ok only in open areas	Broad acre revegetation with local indigenous species suitable

VEGETATION POTENTIAL SITES

The roadside vegetation was categorised into potential sites for protection, rehabilitation and revegetation as described in Table 10 and mapped in Figure 11. The potential site categories should inform the strategic management and restoration of roadside segments.

Table 10: potential site categories (adapted from the proposed potential sites in Philpott 2010)

Code	Site Category and Code	Description
BUS	Bush-care Site	Sites where there is Bush for Life management occurring OR where Bush for Life site management needs to be applied. Many of these sites (after Bush-care management) will be of good enough condition to become CRMS sites.
BUS and REH	Bush-care and Rehabilitation Site	Sites where the vegetation is degraded to a lesser degree and if Bush for Life management practices occurred as well as some rehabilitation works in areas of heavy weed control then those sites would become self-sustaining.
BUS, REH, REV	Bush-care, Rehabilitation and Revegetation site	Generally long segment sites where three different levels of management are required in different areas of that segment. Bush-care type management needs to occur in areas where there is a larger concentration of native species and a minimum of exotics, rehabilitation work is required where there is a good number of native plants and a larger number of exotic species and revegetation works need to be undertaken where native species are at a minimum and where exotic species dominate the area.
BUS, REH, RSS	Bush-care, Rehabilitation and Roadside Significant Site	Sites where the vegetation is degraded to a moderate degree and where very low numbers of plants of conservation significance or those with high local remnancy values occur. After Bush for Life site management practices where significant plants occur as well as some rehabilitation works in areas of weed control then those sites could become future CRMS sites as well sources of seed for future rehabilitation / revegetation work. These sites could also become Adopt a Roadside Reserve sites.
BUS, REV	Bush-care and Revegetation site	Generally long segment sites where two different levels of management are required in different areas of that segment. Bush-care type management needs to occur in areas where there is a larger concentration of native species and a minimum of exotics, revegetation works need to be undertaken where native species are at a minimum and where exotic species dominate the area.
BUS, REV, RSS	Bush-care, Revegetation and Roadside Significant Site	Sites where the vegetation is degraded to a moderate / severe degree and where very low numbers of plants of conservation significance or those with high local remnancy values occur. After Bush for Life site management practices occur as well as some revegetation works in areas of weed control these sites could become future CRMS sites as well as sources of seed for future rehabilitation / revegetation work. These sites could also become Adopt a Roadside Reserve sites.
BUS, RSS	Bush-care / Roadside Significant Site	Sites where low to moderate numbers of plants of conservation significance or those with high local remnancy values occur and the vegetation is degraded to a moderate / severe degree. After Bush for Life site management practices where significant plants occur then those sites could become future CRMS sites as well sources of seed for future rehabilitation / revegetation work. These sites could also become Adopt a Roadside Reserve sites.
REF	Reference Site	Sites where the vegetation is slightly degraded and where moderate numbers of plants of conservation significance or those with high local remnancy values occur. These sites were recommended by Philpott (2010) to be pegged as CRMS sites as soon as possible, and subsequently most REF sites are first generation CRMS sites. They are areas that can provide sources of seed for future rehabilitation / revegetation work. These sites could also become Adopt a Roadside Reserve sites.
REH	Rehabilitation Site	Sites where standard rehabilitation works need to be undertaken. This work would involve on-foot spraying, hand pulling of exotic species as well as some replanting of local vegetation species in areas where there is a moderate population of native species as well as revegetation works in areas of high exotic presence.
REH, REV	Rehabilitation and Revegetation Site	Sites where rehabilitation work and revegetation work need to be undertaken in different areas of the roadside segment. Native plant species are present in low to moderate numbers with a larger number of exotic species present in all segments.
REH, RSS	Rehabilitation and Roadside Significant Site	Sites where the vegetation is degraded and where low to moderate numbers of plants of conservation significance or those with high local remnancy values occur. After some sensitive rehabilitation works have been carried out these sites need to become CRMS sites. They will in turn become sources of seed for future rehabilitation / revegetation work in other areas of Council's roadside system and could also become Adopt a Roadside Reserve sites.
REV	Revegetation Site	Sites where there is a greater number of exotic species than local species and sites where there has been disturbance that has resulted in the disappearance of native vegetation.
RSS	Roadside Significant Site	Segments of roadside that contain vegetation of conservation significance that were not identified as such during Playfair's site allocations. These are most likely to be sites that do not have Management Category A or B assigned. Recommended by Philpott (2010) as CRMS sites.
CRM	Council Roadside Marker Scheme Site	Segments of roadside vegetation currently protected under Council RMS site (i.e. blue marker system). CRMS sites represent areas where significant vegetation occurs that is rated as Category A and B. These sites are numbered on the Potential Site map (e.g. CRM100). Most current CRMS sites were previously assigned site category 'Bush-care Site' (BUS), 'REF' Reference Site (REF), or 'Roadside Significant Site' (RSS).

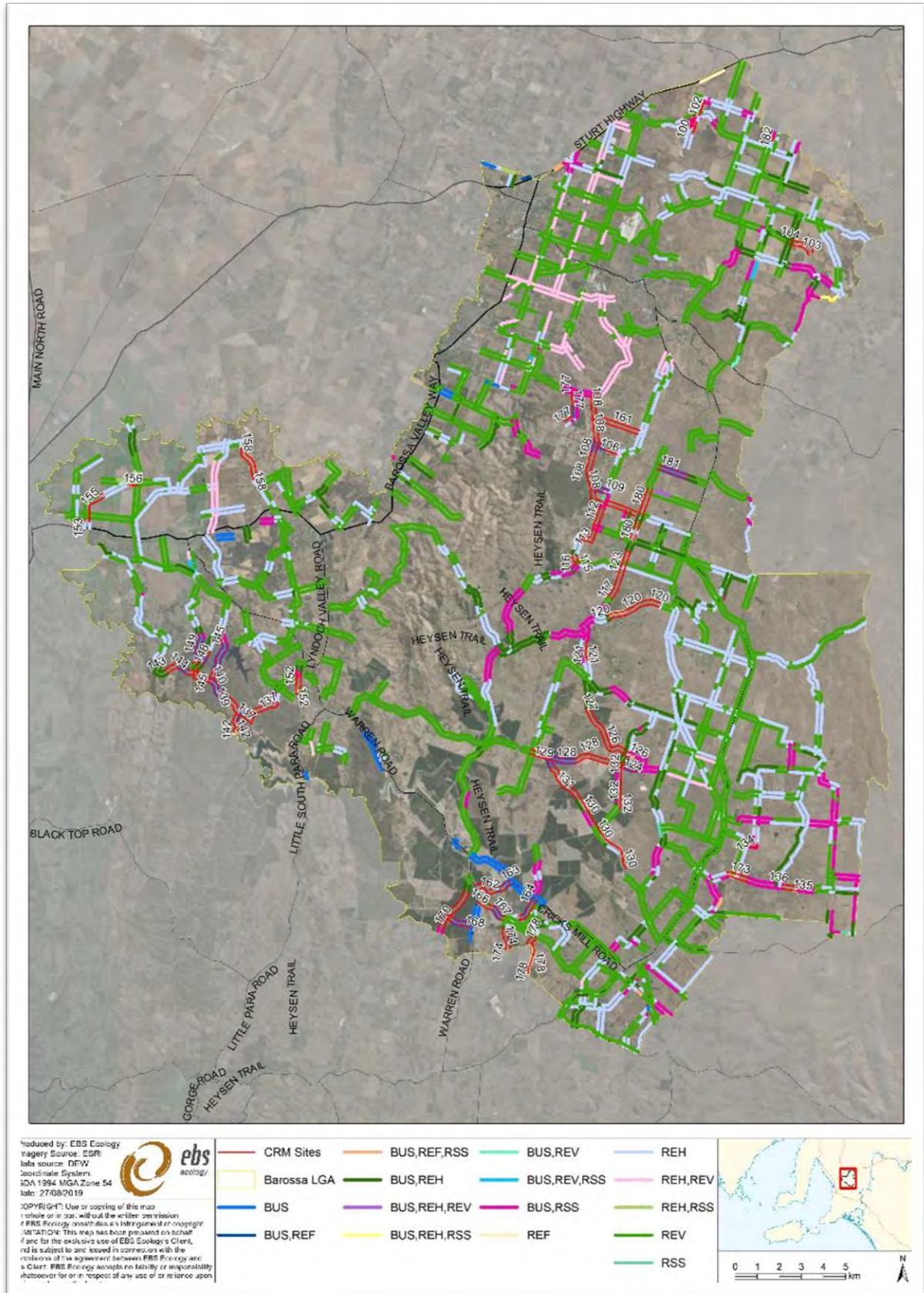


Figure 11: Potential site categories.

THREATENED ECOLOGICAL COMMUNITIES

The following nationally Threatened Ecological Communities (TEC) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are known or may occur within Council roadsides:

- **Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia** (Critically Endangered) – known to occur on several roadsides and represented within CRMS sites.
- **Iron-grass Natural Temperate Grassland of South Australia** (Critically Endangered) - may occur based on DEW roadside mapping descriptions).

The mapped locations of EPBC Act listed Peppermint Box (*Eucalyptus odorata*) Grassy Woodland in Council's area is shown in Figure 12. Applicable roadside sites have not been assessed against the EPBC Act criteria to determine if they qualify as the TEC. CRMS sites which meet the description of the EPBC Act listed Peppermint Box Grassy Woodland are shown in Figure 13.

Iron-grass Grassland, typically containing *Lomandra effusa* (Scented mat rush) and *Lomandra multiflora* spp. *dura* (Hard mat rush), is very poorly conserved in SA. Regionally, any occurrence of Iron-grass Grassland, and other native grassland associations (e.g., *Austrostipa*, *Rytidosperma*, *Aristida* and *Themeda*) is extremely important for conservation. Roadsides, where grazing and cropping have been limited historically, often represent important strongholds for native grass populations.

Native grassland associations are included in the mapped category of "mixed grasslands". Based on the 2019 survey results, none of the CRMS sites were considered representative of an Iron-grass Grassland, and the CRMS sites containing other types of native grassland were in very poor condition.

Based on an extrapolation of the broad vegetation community descriptions from the DEW roadside vegetation layer and the CRMS site surveys, the following provisional state threatened ecosystems are presumed to occur within Council roadsides:

- *Callitris gracilis* +/- *E. leucoxylon* Grassy Low Woodland on quartzite gravels on western footslopes of Adelaide Hills (Vulnerable)
- *E. fasciculosa* +/- *E. leucoxylon* Heathy Woodland on sandy loams of flats and slopes (Vulnerable)
- *E. odorata* +/- *E. leucoxylon* Grassy Low Woodland on loamy soils of low hills (Endangered)
- *Eucalyptus viminalis* ssp. *cygnetensis* and/or *E. viminalis* ssp. *viminalis* Woodland on alluvial soils in moist areas (Vulnerable).

Provisional state threatened ecosystems which may occur within the CRMS sites, based on broad vegetation descriptions are shown in Figure 14.

Threatened ecosystems are not currently recognised under SA legislation.

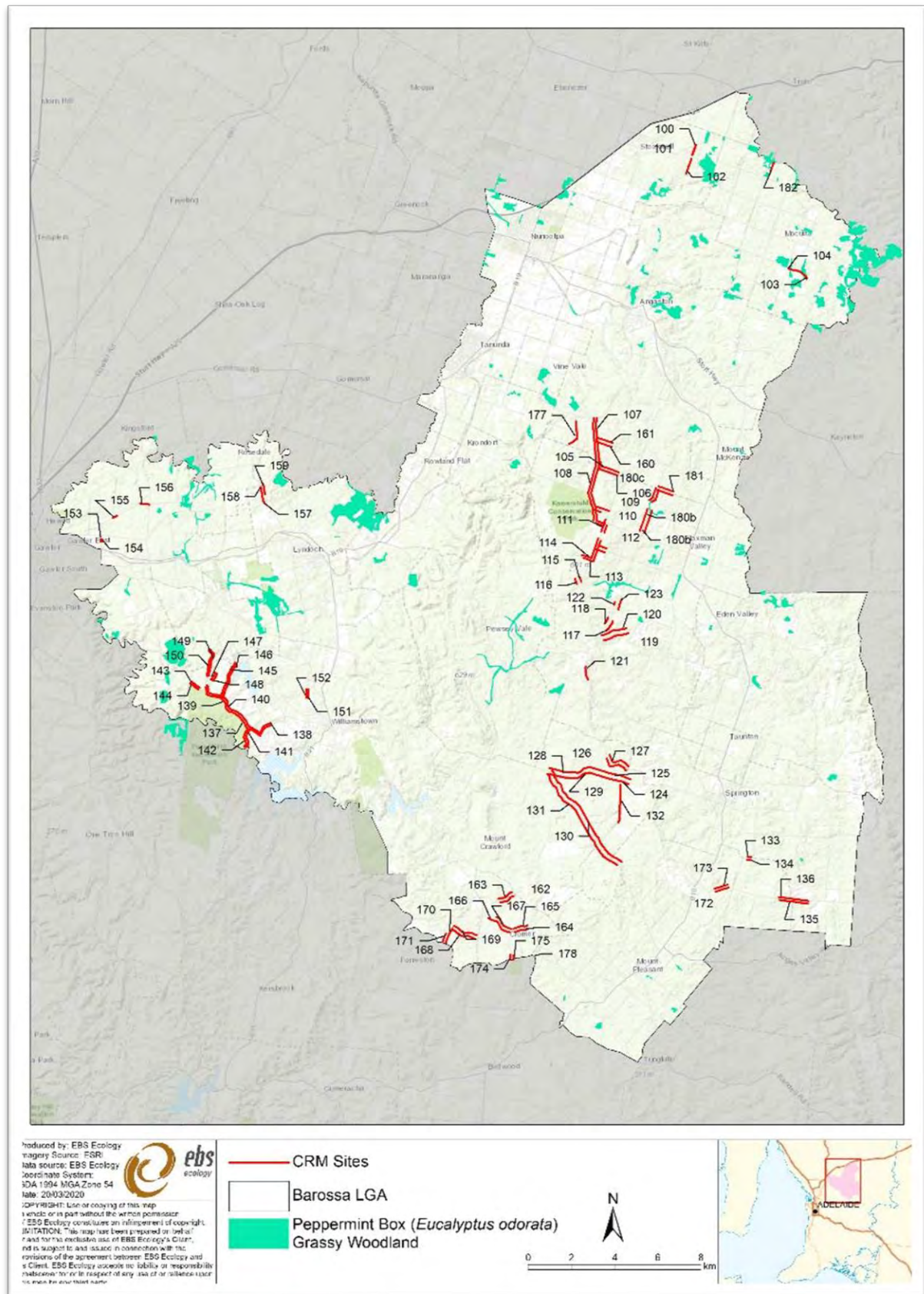


Figure 12: Mapped locations of EPBC Act listed Peppermint Box (*Eucalyptus odorata*) Grassy Woodland threatened ecological community (DEW 2019a).

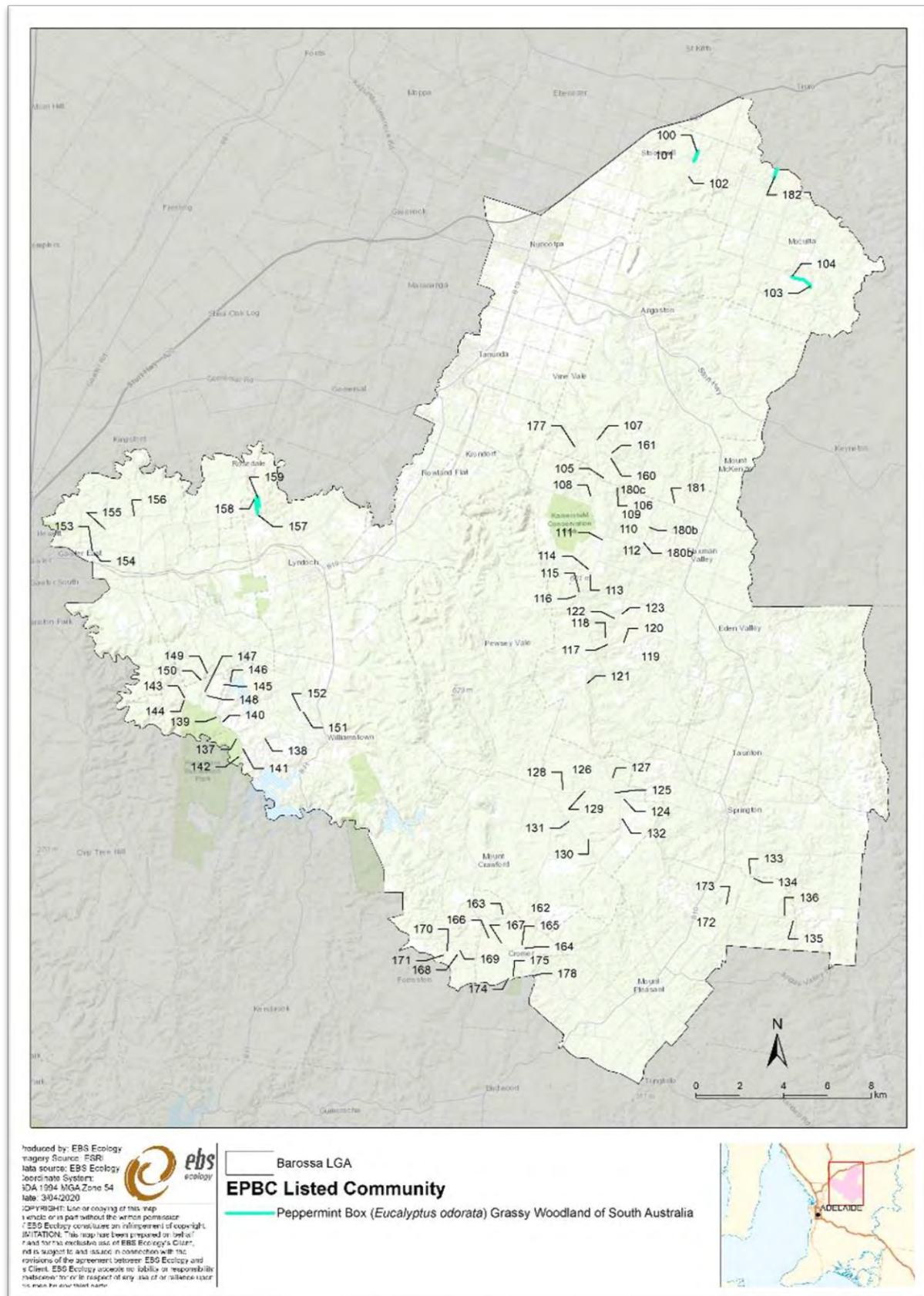


Figure 13: Location of CRMS sites containing EPBC Act listed Peppermint Box (*Eucalyptus odorata*) Grassy Woodland threatened ecological community.

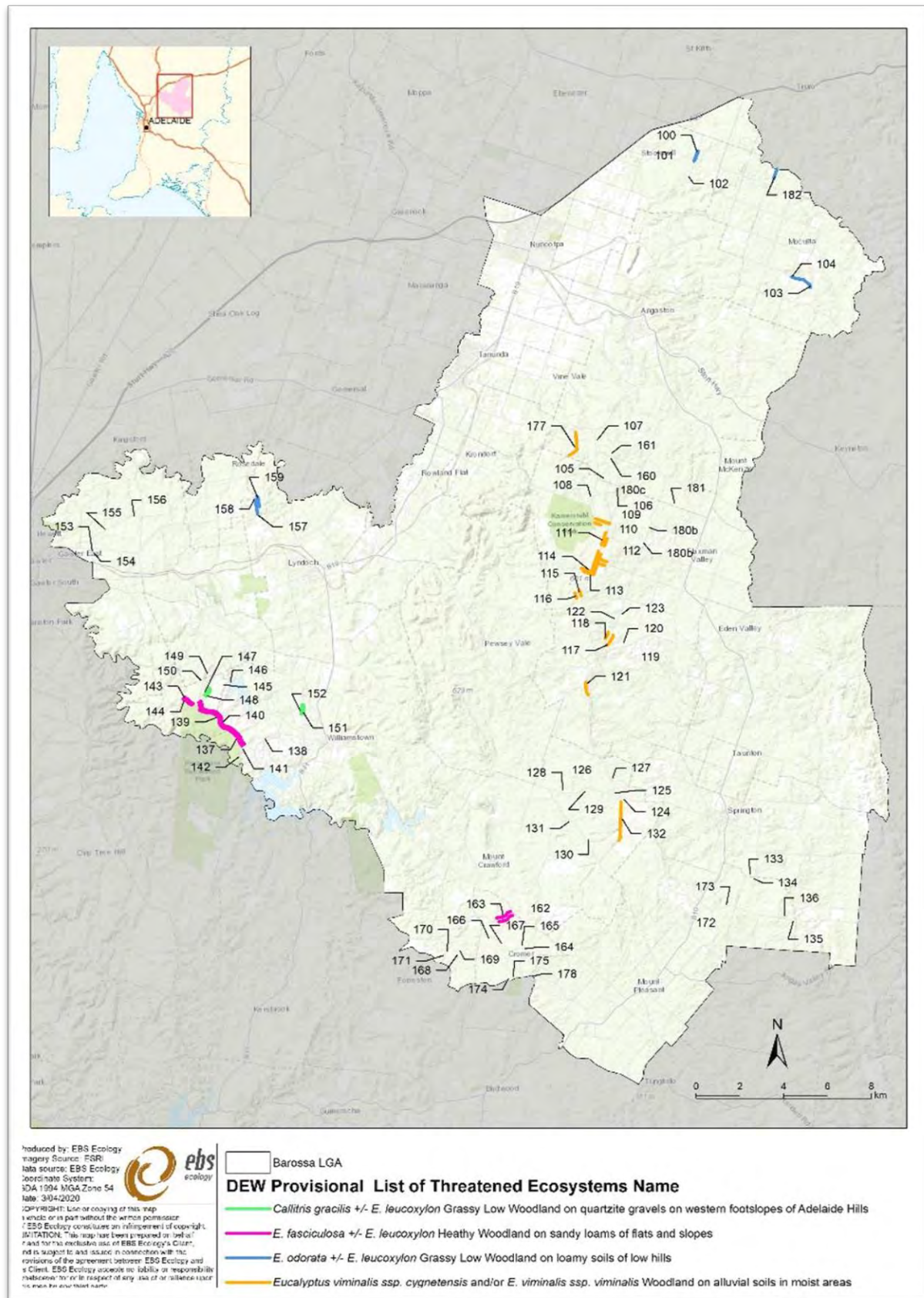


Figure 14: Provisional threatened ecosystems potentially represented within CRMS sites.

CONSERVATION SIGNIFICANCE FLORA

A species may be threatened at a national, state or regional level. The regional conservation assessment is not recognised under SA legislation but helps to better understand and manage threatened species at a regional level. Some species are threatened at a state level, but not within a region. For example, *Eucalyptus fasciculosa* (Pink Gum) is rare in SA but is not considered threatened within the Flinders Lofty Block (FLB) and Kanmantoo (KAN) IBRA regions, where the species is well represented.

One nationally listed species, eight state listed species and 40 regionally threatened species are confirmed from roadsides within Council based on standard roadside survey data, Council RMS site data and Trees for Life (TFL) site data Table 11:

- Five state listed species and 22 regionally threatened species have been recorded at CRMS sites.
- One nationally listed species, five state listed species and 18 regionally threatened species have been recorded at TFL roadside sites.
- One state listed species and twelve regionally threatened species have been recorded during standard drive-by roadside surveys.

Areas of roadside covered by drive-by survey are likely to contain more species than recorded and could include threatened species that went undetected.

Analysis of BDBSA data (DEW 2019a) identified several additional national, state and regionally threatened flora species either known from or potentially occurring on roadsides within Council area (Table 12).

State threatened flora species recorded at CRMS sites are shown in Figure 15.

36 nationally threatened species (flora and fauna) and 14 migratory fauna species are identified by the EPBC Act Protected Matters Search as potentially occurring within Council area. The potential of a site to contain or provide habitat for an EPBC Act listed species, and the potential impact of a proposed activity must be assessed to ensure compliance with the Commonwealth EPBC Act.

Table 11: Threatened flora species recorded within CRMS sites, TFL roadside sites and during standard roadside surveys

Scientific name	Common name	Aus	SA	Region		Site type
				FLB	KAN	
<i>Acacia acinacea</i>	Wreath Wattle			RA		3
<i>Acacia ligulata</i>	Umbrella Bush			RA		3
<i>Acacia retinodes</i>	Wirilda				RA	1,2,3
<i>Acacia salicina</i>	Willow Wattle			RA		3
<i>Acrotriche affinis</i>	Ridged Ground-berry			RA		2
<i>Acrotriche depressa</i>	Native Currant				VU	1,2,3
<i>Apodasmia brownii</i>	Coarse Twine-rush			RA		1,2
<i>Caladenia argocalla</i>	White Beauty Spider-orchid	EN	E	EN	CR	2
<i>Caladenia reticulata</i>	Veined Spider-orchid			RA		1
<i>Callistemon rugulosus</i>	Scarlet Bottlebrush			RA		1
<i>Callistemon teretifolius</i>	Needle Bottlebrush			RA	VU	1
<i>Calocephalus citreus</i>	Lemon Beauty-heads				RA	1
<i>Carex bichenoviana</i>	Notched Sedge			RA	RA	2
<i>Correa backhouseana</i> var. <i>coriacea</i>	Thick-leaf Correa			EN		1
<i>Crassula sieberiana</i> complex	Australian Stonecrop				VU	1
<i>Daviesia arenaria</i>	Sand Bitter-pea			VU	VU	2
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	VU	VU	1,2
<i>Dillwynia sericea</i>	Showy Parrot-pea			RA		2
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	VU	VU	1
<i>Echinopogon ovatus</i>	Rough-beard Grass		R	VU		2
<i>Eucalyptus fasciculosa</i>	Pink Gum		R			1,2
<i>Eucalyptus goniocalyx</i> ssp.					RA	1
<i>Eucalyptus largiflorens</i>	River Box			VU		3
<i>Halgania cyanea</i>	Rough Blue-flower			RA		3
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort				RA	1,2
<i>Hysterobaeckea behrii</i>	Silver Broombush			RA		1,2,3
<i>Kunzea pomifera</i>	Muntries			RA		2
<i>Leptomeria aphylla</i>	Leafless Currant-bush			VU		2
<i>Lomandra collina</i>	Sand Mat-rush			RA		1,2
<i>Lomandra effusa</i>	Scented Mat-rush			RA		1
<i>Lomandra juncea</i>	Desert Mat-rush			RA		2
<i>Melaleuca lanceolata</i>	Dryland Tea-tree			RA		1
<i>Melicytus angustifolius</i> ssp. <i>divaricatus</i>	Tree Violet				RA	1,2,3
<i>Olearia decurrens</i>	Winged Daisy-bush			RA		3
<i>Philothea pungens</i>	Prickly Wax-flower			VU		1
<i>Ptilotus erubescens</i>	Hairy-tails		R	RA	RA	2
<i>Prostanthera chlorantha</i>	Green Mintbush		R	RA		1
<i>Pultenaea hispidula</i>	Rusty Bush-pea			RA		1
<i>Pultenaea tenuifolia</i>	Narrow-leaf Bush-pea			RA		2
<i>Ranunculus amphitrichus</i>	Small River Buttercup			RA		2
<i>Rhagodia parabolica</i>	Mealy Saltbush			RA		1
<i>Rhodanthe laevis</i>	Smooth Daisy			RA		1
<i>Rytidosperma fulvum</i>	Leafy Wallaby-grass			RA	VU	1,2
<i>Santalum acuminatum</i>	Quandong			RA		2,3
<i>Thelymitra carnea</i>	Small Pink Sun-orchid		R	RA		2
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R			1
<i>Xanthorrhoea quadrangulata</i>	Rock Grass-tree				RA	1,3

Aus: Australia (Environment Protection and Biodiversity Conservation Act 1999). SA: South Australia (National Parks and Wildlife Act 1972). FLB: Flinders Lofty Block IBRA region. KAN: Kanmantoo IBRA region. Conservation codes: CE/CR: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. RA/R: Rare.

Site type: 1: Council RMS site, 2: TFL site, 3: Roadside Vegetation Survey (records with source "RV" in DEW 2019a).

Table 12: Additional threatened flora species that may occur within roadsides based on BDBSA data (DEW 2019a)

Scientific name	Common name	Aus	SA
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R
<i>Anogramma leptophylla</i>	Annual Fern		R
<i>Austrostipa breviglumis</i>	Cane Spear-grass		R
<i>Austrostipa densiflora</i>	Fox-tail Spear-grass		R
<i>Baumea gunnii</i>	Slender Twig-rush		R
<i>Caladenia behrii</i>	Pink-lip Spider-orchid	EN	E
<i>Caladenia rigida</i>	Stiff White Spider-orchid	EN	E
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R
<i>Gastrodia sesamoides</i>	Potato Orchid		R
<i>Gratiola pumilo</i>	Dwarf Brooklime		R
<i>Isoetes drummondii</i> ssp. <i>drummondii</i>	Plain Quillwort		R
<i>Juncus homalocaulis</i>	Wiry Rush		V
<i>Luzula ovata</i>	Clustered Wood-rush		R
<i>Maireana excavata</i>	Bottle Fissure-plant		V
<i>Mentha satureioides</i>	Native Pennyroyal		R
<i>Montia australasica</i>	White Purslane		R
<i>Olearia pannosa</i> ssp. <i>pannosa</i>	Silver Daisy-bush	VU	V
<i>Philotheca angustifolia</i> ssp. <i>angustifolia</i>	Narrow-leaf Wax-flower		R
<i>Phyllangium distylis</i>	Tiny Mitrewort		R
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R
<i>Prasophyllum pruinosum</i>	Plum Leek-orchid	EN	V
<i>Prostanthera chlorantha</i>	Green Mintbush		R
<i>Pterostylis psammophila</i>	Two-bristle Greenhood	CR	
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R
<i>Schoenus latelaminatus</i>	Medusa Bog-rush		V
<i>Thelymitra peniculata</i>	Blue Star Sun-orchid		V

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation codes: CE/CR: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. RA/R: Rare. The data lists based on an analysis of BDBSA data clipped to a 20m buffer around roads (using the roadside vegetation layer dataset), and the data filtered to only include records with a spatial accuracy of 1-50m, recorded in the last 20 years.

Photo: *Prostanthera chlorantha* (Green Mintbush).

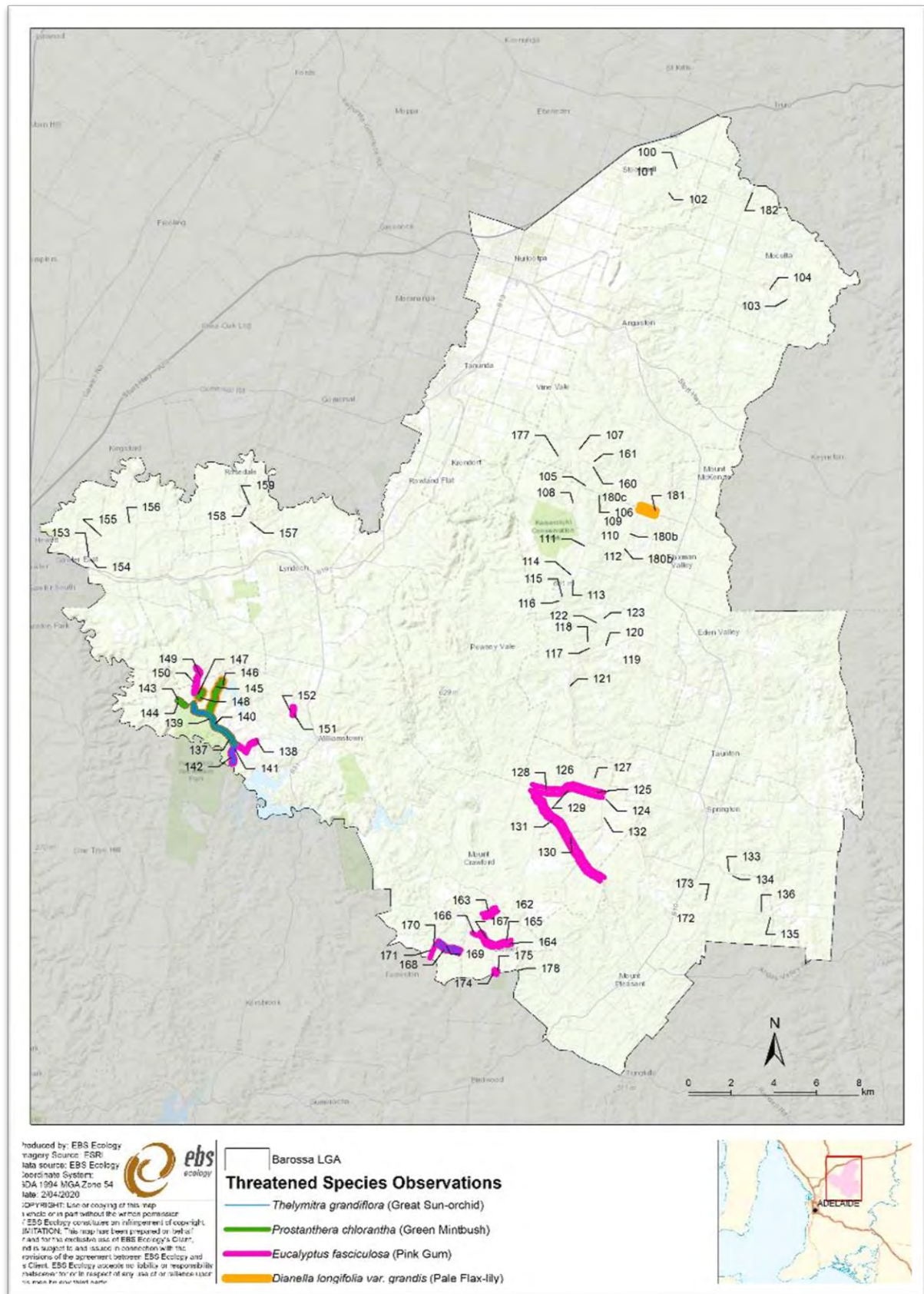


Figure 15: State threatened flora recorded at CRMS sites.



4 SURVEY AND MONITORING

The standard roadside surveys follow a rapid drive-by assessment technique. The existing roadside survey data provides a baseline for any future monitoring and forms the basis for this RVMP.

Most formal roads and areas of vegetation significance have been covered by the current roadside vegetation surveys. Analysis of the roadside vegetation mapping against the current road system and aerial imagery is recommended to identify if there are any survey gaps.

Detailed species lists are only available for selected segments of roadsides (i.e. at reference sites, CRMS sites, TFL BFL sites, and where targeted threatened species surveys have taken place), which represent approximately 6% of the total roadside survey coverage.

The reference sites recommended are mostly encapsulated within CRMS sites. Ongoing monitoring at the CRMS sites and comparison with previous survey data is the best way to track the condition trend across roadside vegetation and identify emerging management issues.

Any appropriate observations along roadsides (e.g., illegal activity, incidental damage, weed outbreaks, significant species) should be recorded into Council's database, and the relevant authorities notified.

The completion of an incident report (when necessary) will also provide Council with data regarding changes to areas of roadside vegetation in which the incident occurred.

By utilising the roadside vegetation spatial data, Council will be able to track the works undertaken in roadside vegetation areas and assess the success or failure of those works.

The establishment and enforcement of SOPs will enable Council better control of activities that occur in roadside vegetation areas by agencies and authorities other than Council.

COUNCIL ROADSIDE MARKER SCHEME SITES

Site monitoring is important to determine the change (+/-) in condition of a CRMS site overtime and the success of site improvement works.

The current 82 CRMS sites were surveyed in 2009 and again in 2019, with species lists compiled and photos taken for each site.

In 2019 CRMS sites were assessed using the NVC Bushland Assessment Method (BAM). CRMS sites on opposite sides of the same road segment were grouped for the BAM assessment. A photo was taken at each site. The BAM photo locations were geo-referenced for repeat monitoring. Photos were also taken at the start and end points of the CRMS sites, where the blue marker pegs were located.

The 2019 CRMS site surveys were time limited, and the coverage and survey effort at each site varied. It is likely that numerous additional species were present, particularly where the understorey was diverse and intact.

The species diversity and cover results are not comparable between the two surveys due to different methodologies; however, the species lists can be compared to identify changes in flora species composition. The number of flora species recorded at each site in the 2019 survey was considerably greater than that recorded in 2009-2010 and detected several state and regionally threatened flora species that had not previously been detected.

It is recommended that the CRMS sites are resurveyed at least every 5 years. More regular monitoring (e.g., every 1-2 years) is justified where specific site threats have been identified. If resourcing is an issue, monitoring at a sub-set of the CRMS sites is preferable over the monitoring not happening at all.

After each survey period, the BAM scoresheets should be completed. Digital copies of the BAM Scoresheets should be provided to DEW for upload of the survey results to the BDBSA.

BUSHLAND ASSESSMENT METHODOLOGY (BAM)

The NVC Bushland Assessment Methodology (BAM) is derived from the Nature Conservation Society of South Australia's 'Bushland Condition Monitoring' (BCM) methodology. This method is suitable for the assessment of any native vegetation for which biological value needs to be determined, including revegetation. Users of the BAM are generally NVC accredited consultants, who are specially trained in the assessment methodology.

The BAM uses biodiversity 'surrogates' or 'indicators' to measure biodiversity value against benchmark communities. A representative 1 ha quadrat is surveyed at each site and a representative photo taken, with GPS co-ordinates and photo direction recorded to compare between assessments. For smaller sites (less than 0.5 ha) or long narrow sites (less than 5 m wide), the standard BAM becomes less applicable as the benchmarked communities become less comparable; a 'small site' assessment is undertaken in such cases. Where possible, CRMS sites were assessed using the standard BAM assessment.

Three components of the biodiversity value of the site are measured and scored: landscape context, vegetation condition and conservation value. These component scores are combined to provide a Unit Biodiversity Score (per ha) and then multiplied by the size (ha) of the site to provide a Total Biodiversity Score for the site.

The factors that influence each of these components and their score ranges are described in Table 13.

Table 13: Factors that influence the value of the three components used to calculate the value (and total SEB Area if relevant) in the BAM

Component	Factors
Landscape context	• Percentage vegetation cover within 5 km • Block shape (cleared perimeter: area ratio) • Native vegetation remnancy of IBRA association • Percentage of native vegetation protected within the IBRA association • The presence of riparian vegetation, swamps or wetlands
Vegetation condition	• Native plant species diversity • Number of native lifeforms and their cover • Number of regenerating species • Weed cover and the level of invasiveness of dominant weed species • Mature tree health, fallen timber, hollow-bearing trees and tree canopy • Native: exotic understory biomass
Conservation value	• The presence of federal or state listed threatened ecological communities and their conservation rating • Number of threatened plant species recorded at the site and their conservation rating • Number of threatened fauna species and their conservation rating or potential habitat occurs within the site

Source: NVC 2019b.



Photo: *Microtis arenaria* (Notched Onion-orchid).

5 TRAINING

Council staff have previously participated in basic roadside management courses and biodiversity awareness training; however, more comprehensive training would assist in raising the level of awareness and understanding.

Training programs will be conducted to familiarise Council staff and relevant others (e.g., contractors, volunteers) with:

- This RVMP
- the requirements under relevant legislation
- the requirements under the *Native Vegetation Regulations 2017*
- relevant Council policies, work procedures and SOPs
- the significance of CRMS sites and roadside vegetation in general, and
- use of spatial data and Council's GIS system when planning road works.

Other specific training could include native plant identification, recognition of rare plants, differentiation between native and exotic grasses, how to undertake a BAM assessment, sensitive work methods (e.g., grader driving) etc.



Photo: *Eucalyptus odorata* Woodland within CRMS site.

6 ABBREVIATIONS AND DEFINITIONS

Abbreviation or term	Definition
Adopt a Roadside Reserve System	Generally, involves landholders (who reside adjacent to or near these sites), and whom express an interest in positive management of those sites, be allowed (after bush-care training and in accordance with Council direction) to undertake active management and act as on-site guardians of these sites.
AMLR	Adelaide and Mount Lofty Ranges
AMLR BMAP	Adelaide and Mount Lofty Ranges Bushfire Area Management Plan
AMLR NRMB	Adelaide and Mount Lofty Ranges Natural Resources Management Board
BAM	Bushland Assessment Methodology
BCM	Bushland Condition Monitoring
BDBSA	Biological Databases of South Australia
BFL	Bush for Life
BMAP	Bushfire Area Management Plan
BMS	Bushfire Management Strategy
cm	centimetre(s)
Carriageway	The portion of a road or bridge devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes (Austroads 2003).
Catch drain	A surface channel constructed along the high side of a road or embankment, outside the batter to intercept surface water (Austroads, 2003).
CFS	Country Fire Service
CRMS	Council Roadside Marker Scheme
Dead plant	Dead plants (under the definition of the <i>Native Vegetation Act 1991</i>), means the class of plants, or parts of plants, comprising trees of a species indigenous to South Australia – • (a) that have a trunk circumference of 2m or more (measured at a point 300mm above the base of the tree), and • (b) that provide or have the potential to provide or are a part of a group of trees or other plants (whether alive or dead) that provide, or have the potential to provide, a habitat for animals of a listed threatened species under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>.
Declared weed	Weeds that are regulated under the <i>Natural Resources Management Act 2004</i> due to their threat to primary industry, the natural environment and public safety. Plants are declared under the provisions of the Act relating to their movement, sale, notification and control.
DEE	Department of the Environment and Energy (Australian Government)
DEW	Department for Environment and Water (SA Government)
DIT	Department of Infrastructure and Transport (SA Government)

Abbreviation or term	Definition
E	Endangered (Schedule 7, Part 2, NPW Act)
EBS	EBS Ecology
EN	Endangered (EPBC Act)
EO	Environmental Officer
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
FLB	Flinders Lofty Block
Frangible vegetation	Frangible vegetation refers to plants with slender stems which give way break or uproot on impact.
Guidelines	Unless stated otherwise, refers to the Guidelines for the Management of Roadside Native Vegetation and Regrowth Vegetation Under Native Vegetation Regulation 11(23) .
ha	Hectare(s)
HVNL	Heavy Vehicle National Law
NHVR	National Heavy Vehicle Regulator
IBRA	Interim Biogeographic Regionalisation for Australia
Indigenous	Plant or animal species that originate in a particular area
KAN	Kanmantoo
km	Kilometre(s)
Large tree	A tree (including a dead tree) where the circumference of the trunk of the tree is 2m or more, when measured at a height of 30cm from the base of the tree.
LGA	Local Government Area
m	Metre(s)
mm	Millimetre(s)
Mitre drain	Drain constructed diagonal to the road for draining water from the road, usually extending into area of natural ground surface beyond the verge.
MNES	Matters of National Environmental Significance
MY	Mundulla Yellows
Native vegetation	A plant or plants of a species indigenous to South Australia
Natural ground surface	Remainder of roadside not previously cleared for road construction. Note that it may include soil and vegetative debris that have been graded in from the verge.
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
Non-frangible native vegetation	Plants species with a stem diameter (at maturity) of 100mm or greater with rigid, large or sturdy stems which will not readily break, bend or crush upon impact by a typical passenger vehicle, and could be expected to inflict significant damage to the vehicle and possibly cause injury to vehicle occupants. Note - stem diameter is measured at a height of 1 metre above natural ground.
NPW Act	<i>National Parks and Wildlife Act 1972</i> (SA)
NRM	Natural Resource Management
NRM Act	<i>Natural Resources Management Act 2004</i> (SA)

Abbreviation or term	Definition
NV Act	<i>Native Vegetation Act 1991</i> (SA)
NVAP	Native Vegetation Assessment Panel. The NVAP is a sub-committee of the NVC, that makes decisions on native vegetation issues. The NVAP has delegation to, among other things, make decisions on native vegetation clearance applications, including conditions of consent; make decisions under the Native Vegetation Regulations, including Significant Environmental Benefit (SEB) conditions; and approve local council roadside vegetation management plans.
NVB	Native Vegetation Branch (of DEW). The NVB is a work unit within DEW, that provides support to administer the <i>Native Vegetation Act 1991</i> . The NVB can provide advice regarding clearance applications and native vegetation management plans.
NVC	Native Vegetation Council. The NVC is an independent body established by the <i>Native Vegetation Act 1991</i> . The NVC monitors the overall condition of the state's vegetation and makes decisions on a wide range of matters concerning native vegetation in South Australia.
PDC	Principles of Development Control
PIRSA	Primary Industries and Resources South Australia
Primary Clearance Envelope	The area of the road that will support regular vehicle movement up to the edge of the shoulder.
Public safety	The safety of persons or property, including the safety of— a) the drivers of and passengers in vehicles; and b) persons in or in the vicinity of (or likely to be in or in the vicinity of) roads, road infrastructure and public places; and c) vehicles and any loads in or on them: (<i>Road Traffic Act 1961</i>)
R	Rare (Schedule 9, Part 2, NPW Act)
RAVnet	RAVnet is an interactive online map system that displays approved heavy vehicle route networks in South Australia. Restrictions associated with specific route networks are also included. This interactive tool allows you to choose heavy vehicle route networks to view on screen or print.
Regionally threatened	A species that has been assigned a category of CR, EN, VU or RA under the Regional Conservation Assessment Project (Gillam and Urban 2014)
Regrowth vegetation	Any vegetation growing after clearance, this includes re-growing from rootstock, or germination of new plants from seed in the area previously cleared
Roadside Marker Scheme / RMS	An important and valuable means of identifying, managing and protecting important areas of roadside vegetation. The marker system helps protect these areas from disturbance through activities such road maintenance and upgrades, weed and pest control programs or similar. Sites are identified by small blue marker signs at the start and end of important areas.
Road furniture	A general term covering all signs, streetlights and protective devices for the control, guidance and safety of traffic, and the convenience of road users.
Road network	Public roadway (formed travelling surface), shoulder and table drain throughout the Council area.

Abbreviation or term	Definition
Road reserve	Land set aside for the purposes of a public road, whether or not it is being used for that purpose; and extends from property boundary on one side to property boundary on the other side.
Road verge	Area between the road formation and the boundary of the road reserve and the adjacent property, excludes road drainage features.
Roadside	The strip of land between the road formation and the boundary of the road reserve.
Roadside vegetation	Any vegetation growing on a road reserve and includes vegetation on a roadside (the area adjacent to a formed road, which is usually also the boundary of the adjacent property), and vegetation growing on an unmade or undeveloped road reserve; this ranges from native vegetation of conservation value to vegetation dominated by introduced species.
RVMP	Roadside Vegetation Management Plan
SA	South Australia(n)
Sealed road	The sealed travelling surface and shoulder
SEB	Significant Environmental Benefit
Secondary Clearance Envelope	Area where vegetation that has regrown and affected the visibility of other traffic, signs, and other roadside furniture.
Segment section	Length of roadside where the dominant vegetation species is continuous. Segments change when the dominant species differs. This segment measure is taken by the odometer of a vehicle.
Sight distance	The distance over which a road user needs to have unobstructed sight to respond to a visual cue, or safely avoid a conflict.
Sight triangle	The area of land between two intersecting roadways over which vehicles on either roadway are mutually visible.
SISD	Safe intersection sight distance
Shoulder	The portion of formed carriageway that is adjacent to the traffic lane and flush with the surface of the pavement (Austroads 2010).
SOP	Standard Operating Procedure
sp.	Species (when the sp. is unknown)
spp.	Species (plural)
ssp.	Subspecies
TBC	The Barossa Council
TBD	to be determined
TEC	Threatened ecological communities
TFL	Trees for Life
Travelled way	The portion of a carriageway ordinarily assigned to moving traffic, and exclusive of shoulders and parking lanes.
Understorey	Plant species such as shrubs, herbs and grasses that grow underneath the upper layer of tall shrubs and or trees.
Undeveloped road	A surveyed road reserve which has never been developed as a road (some are totally cleared and pass unmarked through farm paddocks, and others retain native vegetation).
Unsealed road	The formed travelling surface, shoulder and table drain.
V	Vulnerable (Schedule 8, Part 2, NPW Act)

Abbreviation or term	Definition
Verge	The portion of the formation not covered by the carriageway or footpath (Austroads 2010). This is typically the strip beyond the shoulder comprising the area cleared when the road was constructed, including drains (excluding mitre drains) and batters. There is usually a small embankment or change in ground surface that identifies the outer edge of the verge. It does not include vegetation growing on the natural ground surface.
VU	Vulnerable (EPBC Act)
WoNS	Weed of National Significance