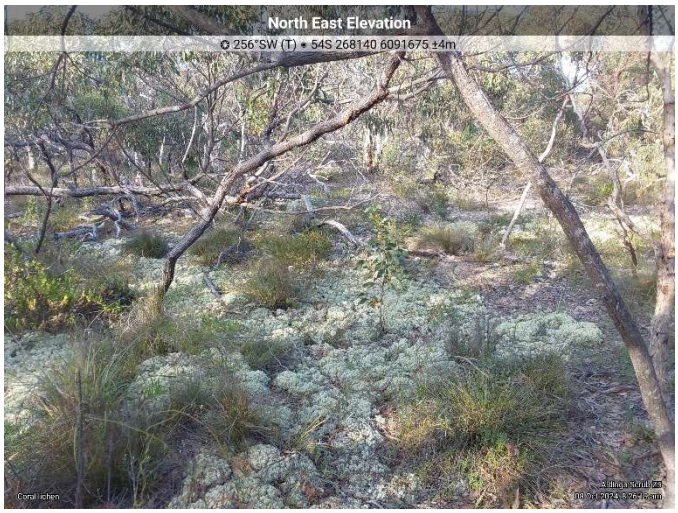



Aldinga Scrub Vegetation Condition & Change Assessment

Report to Green Adelaide (Department for Environment and Water)

Prepared by Catherine Miles & Oliver Koch

March 2025

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The author would like to acknowledge Kaurna as the traditional owners of the area now known as Aldinga Scrub

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Cover photos (clockwise from top left): Lacy Coral Lichen, Aldinga Dampiera, Western Grey Kangaroos, Notched Onion Orchid.

All maps and photographs are produced by Miles Environmental Pty Ltd unless otherwise stated

SUMMARY

The report presents the findings of a Vegetation Condition and Change Assessment, to understand if works undertaken over the past 10 years have been effective in achieving identified Goals within the Aldinga Scrub Conservation Park, Biodiversity Plan 2014 and provides guidance for vegetation management for the site for the next 5 years.

The Aldinga Scrub Conservation Park comprises 267 ha of remnant coastal bushland, formerly grazed bushland, cleared land and regenerating areas that was dedicated as a Conservation Park in 1985. Extensive vegetation clearance and urbanisation of surrounding areas has resulted in the Park being biologically isolated from other areas of native vegetation but highly significant as one of the only large remnants of native vegetation within a 20km radius. The Aldinga Scrub Conservation Park has in recent years been combined to with the Aldinga Washpool to form the Aldinga Conservation Park. The report focusses only on the area of the original Conservation Park – the "Scrub."

Following the assessment of condition change, the existing goals were considered generally appropriate to continue forward with a slight change which places emphasis on maintaining high quality vegetation and improving vegetation in moderate to good condition:

- Protect and foster significant native species;
- Maintain the condition of primary vegetation management areas;
- Improve the condition of secondary vegetation management areas;
- Maintain the condition of vegetation in the remainder of the park.

Recommendations to achieve these Goals that need to be implemented at the scale of the whole of the Aldinga Scrub site or multiple vegetation Management Units focus are:

- Implement the recommendations for environmental water requirements EA (2012)
- Investigate and implement short and long-term options to manage grazing pressure
- Maintain fenced-off areas (including threatened flora sites)
- Manage threatened flora
- Update the fire management plan for the Scrub and implement actions as appropriate.
- Improve the availability of hollows by installing nestboxes and removing feral bee hives in tree hollows.
- Implement soil hygiene measures to minimise the spread *Phytophthora cinnamomi*.
- Hold an annual stakeholder meeting to review, coordinate and plan activities for the following year.

Slight changes were recommended to the former (2014) zone boundaries for future management and new vegetation Management Units. Based on the assessment and new MU boundaries, the objectives and essential actions for each are presented in **Table 1**. Supplementary actions to improve Mus are also provided in the body of the report (section 3.1)

The vegetation condition and change assessment involved a combination of document and data review, consultation with key stakeholders and field surveys to address the project objectives. The field surveys used the Native Vegetation Council (2024) Bushland Assessment Methodology (BAM). For the change assessment it was necessary to use the previously defined zones. Overall, the assessment has shown that in 2024, 9 out of the 19 zones have improved in condition compared to 2014, the single zone classed as excellent on 2014 had been maintained and 4 zones in moderate to good condition had also been maintained.

The available baseline data and methodology used in this assessment enables progress to be measured for two of the three goals set in the 2014 plan, while one goal requires a targeted assessment. Overall, the goals appear to have been partially met and most objectives achieved. Threats and key drivers of change are discussed in section 4.3; the impacts of grazing are considered to be a likely cause for improvements not being achieved more widely despite progress on the management objectives.

Table 1 Summary of management units (MU), vegetation condition and priority for management and essential activities to achieve the MU objectives, with MUs in order from high priority to low priority

MU	Vegetation description	Condition	Priority	Objective	Essential activities
4	Coastal shrubland and heath	Excellent	Highest	Primary MU: maintain	1. Continue annual patrol for and removal of high threat weeds (Perennial Veldt Grass, African Boxthorn, Boneseed, Pyp Grass, Coastal Tea Tree, Sallow Wattle etc. and any other weeds that may regenerate)
5	Drooping Sheoak and Pink Gum low woodland	Excellent	Highest	Primary MU: maintain	1. Maintain threatened species in fenced areas with weeding, monitoring and other actions as required 2. Biennial sweep through zone to: - Control isolated high threat weeds: Boneseed, Rhamnus, Acacia saligna, Coast Tea-tree - Guard regenerating Eucalypt, Banksia and other uncommon species 3. Annual patrol for and control of Bridal Creeper in previous control areas and continue to push this and other weed front southwards
16	Grey Box woodland with Mallee Box	Moderate	High	Secondary MU: Improve	1. Annual control program for Bridal Creeper in conjunction with adjacent zone 14 2. Biennial sweep through zone to control isolated woody weeds, including Olive regeneration. 3. Spot weed around native groundlayer species. 4. Revegetate in patches with native grasses and groundcovers (e.g. local native *Rytidosperma spp., Austrostipa spp., Einadia nutans, Enchylaena tomentosa, Lomandra* spp., *Vittadinia cuneata and V. australisica*) to create a seed source, protect from grazing and spot weed.
6	Mallee Box woodland	Moderate	High	Secondary MU: Improve	1. Annual control program for Bridal Creeper in conjunction with adjacent zone 5, pushing the weed front from south to north in 6a and north to south in 6b. 2. Biennial sweep through zone to control isolated woody weeds.
8	Pink Gum and Drooping Sheoak woodland	Good	High	Secondary MU: Improve	1. Maintain threatened species in fenced areas with weeding, monitoring and other actions as required. 2. Biennial sweep through entire zone to control isolated high threat weeds: Boneseed, African Daisy, Rhamnus 3. Annual patrol for and control of Bridal Creeper and other high threat weeds in previous control areas, containing spread from zone 6a, 6b and pushing north towards 3, east towards 9 and south towards 15. 4. Ensure soil hygiene measures implemented for possible *Phytophthora cinnamomi* (Pc)

MU	Vegetation description	Condition	Priority	Objective	Essential activities
10	River Red Gum forest, aquatic herbland, sedgelands and open shrublands	Moderate	High	Secondary MU: Improve	1. Biennual sweep through zone to control isolated high threat weeds: Rose, Olive, African Daisy 2. Annual follow- up monitoring for and control of Bridal Creeper 3. Implement EA (2012) environmental water requirements recommendations 1 & 2
14	Drooping Sheoak & Pink Gum low open woodland	Good	High	Secondary MU: Improve	1. Biennial sweep through zone to control isolated high threat weeds (including Acacia saligna, Boneseed, Olives, Freesia, Galenia, non-native Pigface). 2. Monitor and maintain Sticky Daisy-bush, including continue to weed, guard (especially any regeneration) and propagate and transplant into adjacent areas on similar soils to increase the population (in consultation with regional threatened flora ecologist). 3. Plant, protect and monitor Aldinga Dampiera which was formerly recorded in this MU. 4. Control Bridal Creeper, working from north and west to southern and eastern boundaries of the zone. 5. Control Onion Weed and Scabiosa along the old extension of Red Gum avenue. 6. Maintain fenced areas with weeding, especially Perennial Veldt grass.
7	Pink Gum and Pittosporum	Poor to moderate	Medium - high	Secondary MU: Improve	1. Annual monitoring for and control program for Bridal Creeper in conjunction with adjacent zones (6b and 8). 2. Biennial sweep through zone to control isolated woody weeds (Boneseed, Olives).
3	Drooping Sheoak, Mallee Box and Pink Gum low open woodland	Moderate	Medium	Maintain	1. Biennial sweep through zone* to: - Control isolated high threat weeds: Carpetweed & Boneseed. - Guard regenerating Sheoaks and other species from grazing (except Seaberry saltbush, Kangaroo Thorn). ** Ideally the entire zone but if this is not feasible within available resources, work from the southern and western zone boundaries towards the north and east.*
9	Pink Gum woodland	Moderate	Medium	Maintain	1. Biennial sweep through zone to: - Control isolated high threat woody weeds including Sydney Coastal Wattle, Rhamnus and African Daisy - Guard regenerating Eucalypt, Banksia and other uncommon species 2. Maintain fenced areas with weeding, especially Perennial Veldt grass. 3. Control Bridal Creeper, working from eastern boundary with zone 8 and northern boundary with wetlands (zone 10) towards the south and east.
15	Pink Gum and Drooping Sheoak low open woodland	Moderate	Medium	Maintain	1. Biennial sweep through zone to control isolated high threat weeds (including Boneseed, Freesia, African Daisy, non-local Tea-tree and Olives) or if resources are limited, work along boundary with adjacent zones (including 16). 2. Follow-up Bridal Creeper control areas.

Aldinga Scrub Vegetation Condition and Change Assessment

MU	Vegetation description	Condition	Priority	Objective	Essential activities
17	Drooping Sheoak & Pink Gum low open woodland	Moderate	Medium	Maintain	1. Biennial sweep through zone to control isolated high threat weeds (including Rhamnus, Boneseed, Olives, African Daisy, Acacia longifolia longifolia) or if resources are limited, working from north to south. 2. Control Bridal Creeper working from north to south.
13	Bulrush and Lignum stormwater wetland	Moderate	Low	Maintain	1. Monitor for and control high threat weeds (including Rhamnus on adjacent land)
11	Pink Gum grading to River Red Gum revegetated woodland	Poor	Low	Maintain	*1.* Biennial sweep through entire zone to *a.* Control isolated high threat weeds: including Bridal Creeper, Carpetweed, African Daisy and Olives, and non-local natives from historic plantings. *b.* Guard regenerating Mallee Box and other palatable species.
1	Mallee Box and Pink Gum revegetated open woodland	Poor	Low	Maintain	1. Biennial sweep through entire* zone to: - Control isolated high threat weeds: Lippia, Carpetweed, African Daisy (at least prevent seed set), Boneseed - Guard Creeping Boobialla and seedling eucalypts and shrubs (except Seaberry saltbush, Kangaroo Thorn) **If entire zone is not feasible, priority to the most eastern end working westwards*
18	Bracken Fern fernland grading to Spiny Flat-sedge sedgeland	Very poor	Lowest	Maintain	1. Biennial control of isolated environmental weeds (e.g. Galenia, Artichoke Thistle and Onionweed) and monitor around planted and remnant trees and shrubs for Bridal Creeper and control as required.
12	Exotic grassland/ herbland with Pink Gums and non-local plantings	Very poor	Lowest	Maintain	1. Control high threat weeds with potential to spread to adjacent zones, with priority to preventing seed set and working away from boundary the with zone 8: Bridal Creeper, Olives, Onion Weed (along track), Cottonbush and Peppercorn Tree.
2	Exotic herbland	Very poor	Lowest	Maintain	1. Biennial control of isolated highly invasive weeds (e.g. Bridal Creeper, Gazania)

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1. INTRODUCTION

1.1 OBJECTIVE

The objectives for this project are:

1. To undertake a Vegetation Condition and Change Assessment, to understand if works undertaken over the past 10 years have been effective in achieving identified Goals within the *Aldinga Scrub Conservation Park, Biodiversity Plan 2014*.
2. To provide guidance for vegetation management for the site for the next 5 years for each management unit.

While the first objective shaped the assessment and methodology, the second objective (i.e. guidance for vegetation management) is presented before the first as it is anticipated that this part of the document will be used more into the future.

1.2 BACKGROUND[1]

Active management to conserve and improve biodiversity in the park has been occurring for over 35 years, guided initially by the Aldinga Scrub Conservation Park Management Plan, followed by Vegetation Management Plan, Aldinga Scrub conservation Park 2001 – 2011 and more recently the Aldinga Scrub Conservation Park, Biodiversity Plan 2014.

The Aldinga Scrub Conservation Park (CP), approximately 46 kilometres south of the City of Adelaide, was dedicated as a Conservation Park in 1985. It comprises 267 ha of remnant coastal bushland, formerly grazed bushland, cleared land and regenerating areas, and has attracted the attention of field naturalists, biologists and ornithologists for many decades e.g. Fenner & Cleland (1935). The Aldinga Scrub is a remnant of a former network of wetlands and vegetated dunes situated behind coastal foredunes (Gardiner 1989; Ashton 2001). This network also includes other important wetland habitats to the south of the Conservation Park; Blue Lagoon and The Washpool area.

The Aldinga Scrub CP faces many of the management challenges typical of peri-urban reserves. Extensive vegetation clearance and urban consolidation have left the park biologically isolated from other patches of remnant vegetation, there being few other substantial remnants within a 20 kilometre radius (Armstrong et al. 2003). This isolation has consequences for biodiversity management. Many plant and animal populations are now largely restricted to the park, and these species may not be able to recolonise if existing populations become locally extinct. In addition, recent changes in the land use of adjacent areas has led to challenges in managing a semi-captive kangaroo population which has significantly increased the grazing pressure on site.

The Aldinga Scrub Conservation Park has in recent years been combined to with the Aldinga Washpool to form the Aldinga Conservation Park. Consolidating adjacent conservation areas into one park has been a priority for the state and local governments and the community. To the Kaurna People, the park is a place of cultural and spiritual significance. A new management plan is currently in development and will set the strategic direction taking into account the cultural heritage significance to the Kaurna People for the combined areas. A Bushland Re-assessment for Washpool Lagoon was completed in 2022 and as such the scope of this condition assessment is for the old Aldinga Scrub area as highlighted in the 2014 biodiversity plan.

[1] This background information has been provided by Green Adeaide

2. RECOMMENDATIONS FOR VEGETATION MANAGEMENT 2025 TO 2030

2.1 GOALS & OBJECTIVES

Following the assessment of condition change, the existing goals were considered generally appropriate to continue forward with a slight change which places emphasis on maintaining high quality vegetation and improving vegetation in moderate to good condition:

- Protect and foster significant native species;
- Maintain the condition of primary vegetation management areas;
- Improve the condition of secondary vegetation management areas;
- Maintain the condition of vegetation in the remainder of the park.

The primary and secondary vegetation management areas are defined in Section 3 and **Table 3**.

2.2 BIODIVERSITY MANAGEMENT OBJECTIVES

The following objectives from the 2014 plan are still considered largely appropriate for the Aldinga Scrub, noting that objectives 2a and 3c are effectively outside the scope of vegetation management activities. One objective (2c) has been added and objective 3d has been modified:

1. Protect and foster plant species of conservation significance by

    a. Reducing the impact of weeds, preferably using minimal-disturbance methods,

    b. Initiating new sub-populations by translocating individual plants into suitable habitat;

2. Protect and foster native fauna species through

    a. Improving knowledge of their abundance, distribution and habitat requirements in the park,

    b. Ensuring management activities do not have negative effects on species persistence;

    c. Maintain and improve the range of habitat resources required by significant native fauna.

3. Protect and foster native vegetation communities by:

    a. Removing key weed species from the park using minimal-disturbance methods;

    b. Monitoring for new weed incursions and other biodiversity threats, and managing threats as soon as practical;

    c. Managing total grazing pressure to maximise natural regeneration rates;

    d. Assess risks and requirements for ecological burning and fire hazard and implement as required, including undertaking post-fire weed control and grazing protection to maximize native plant community recovery;

    e. Liaising with neighbours where issues on adjoining properties (e.g. weed spread) may affect the park;

    f. Negotiating appropriate storm-water management with relevant land managers;

    g. Supplementing natural regeneration with local-provenance tubestock where appropriate;

    h. Undertaking large-scale habitat restoration of degraded areas.

2.3 WHOLE OF SITE RECOMMENDATIONS

The following recommendations apply to the whole of the Aldinga Scrub site or multiple Vegetation Management Units:

- Implement the recommendations for **environmental water requirements** (EA 2012):
    1. Provide a seasonal water regime in the Aldinga Scrub wetlands,
    2. Relocate infrastructure to manage excess stormwater outside the Conservation Park,
    3. Rehabilitate groundwater monitoring bores and continue groundwater monitoring,
    4. Survey vegetation and monitor risks,
    5. Monitor ecosystem and review management.
- Investigate and implement short and long-term options to manage **grazing pressure**:
    - In the short term this will involve a focus on protecting sensitive vegetation from grazing with physical protection, such as with individual plant guards, small exclosures using farm gates or larger fenced exclosures,
    - Investigations for longer term management will need to look at how to manage the total grazing pressure in the Scrub in conjunction with regional-scale grazing pressure management and may include managing water availability.
- Maintain **fenced-off areas** (including threatened flora sites)
    - Control weeds (especially Perennial Veldt grass) in fenced-off areas, using appropriate measures for threatened species
    - Monitor fuel loads in fenced off areas and manage accordingly to reduce bushfire risks to threatened flora.
- Manage **threatened flora**:
    - Continue to protect, monitor and manage threatened flora (including the Lacy Coral Lichen) in fenced-off areas as required,
    - Monitor populations of threatened flora outside of fenced-off areas, in particular assess population demographics and propagate and transplant or other actions if required.
- Update the **fire management** plan for the Scrub and implement actions as appropriate.
- Improve the **availability of hollows** by:
    - Installing nestboxes for a range of different fauna in vegetation Management Units that lack tree hollows, in particular those requiring hollows with openings > 5 cm; monitor for feral bees and remove if required.
    - Record and remove feral bees in natural tree hollows where feasible.
- Implement **soil hygiene** measures to minimise the spread *Phytophthora cinnamomi*.
- Hold an annual stakeholder meeting to review, coordinate and **plan activities** for the following year.

2.4 MONITORING

Key monitoring activities to report against the goals and objectives for the Scrub are presented in Table 2.

Table 2 Summary of priority vegetation monitoring activities

Monitoring purpose	Requirements
Vegetation management planning	Re-monitor BAM sites* every five year and at minimum every 10 years. Review results against objectives in this plan and update vegetation management recommendations accordingly.
Bushland condition monitoring	Reduce the frequency of bushland condition monitoring (BCM) but incorporate additional sites to represent the range of vegetation present across the Scrub. BCM sites could be sited within the BAM sites. BCM monitoring includes many of the same indicators as the BAM method but collects more detailed and quantitative monitoring data for tree health, ground cover, grazing pressure and natural regeneration – all of which are of

Monitoring purpose	Requirements
	concern at Aldinga Scrub. While all indicators are useful to monitor, these four indicators should be a priority if time and resources are limited.
Tree health and populations	Establish tree health monitoring sites across a representative range of sites across the site, this may be as part of the BCM monitoring but should include an assessment of the population demographics.
Grazing impact assessment	Continue TAFE kangaroo monitoring program. Monitor grazing impact, including inside and outside grazing exclosures, potentially establishing additional grazing exclosures. Assess result to determine if species are being lost from the Scrub and costs and benefits of grazing management activities.
Threatened flora	Continue to monitor the extent and health of threatened flora species within the Park.
Birds	Continue to monitor bird species within the Scrub and assess results with respect to vegetation monitoring and habitat uses.

*Only 1 BAM site per management unit.

3. VEGETATION MANAGEMENT UNITS AND RECOMMENDATIONS

This section provides guidance for vegetation management for the Aldinga Scrub for the next 5 years based on an assessment of the current vegetation condition and change since 2014, to understand the effectiveness of works undertaken since the publication of the *Aldinga Scrub Conservation Park, Biodiversity Plan 2014*. The Assessment methodology is described in Section 4.1. Recommendations for vegetation management have been developed based on this assessment.

For future management of vegetation in the Aldinga Scrub, 18 Management Units (MU) have been defined and these MUs replace the Zones of the 2014 plan. The MUs were defined in consultation with the FoAS and aim to simplify management for the future by amalgamating existing zones, or parts of zones, with similar vegetation composition, condition and management requirements and by splitting out areas with distinctly separate vegetation composition, condition and/or management requirements. The relationship between the previous and new zones and the assessment areas are presented in Appendix 1.

The Vegetation Management Units (MU) and priority for management are summarised in **Table 3** and **Figure 1**. A summary of the vegetation condition in each MU and the recommendations for vegetation management for the Unit for the next five years (2025 to 2030) is detailed in section 3.1. The vegetation condition assessments were undertaken for the previous 2014 zones and then adapted to guide management for the future and therefore the descriptions of the Management Units sometimes refer to more than one assessment area.

Rationale for Prioritisation

The basis for prioritising and setting objectives for the MU's is based on the following rationale:

- MU's in excellent condition are a high priority to maintain the condition, these areas should only require a low level of resources to maintain but are still at risk of deteriorating if not actively maintained,
- MU's in good condition are a high priority to work in to improve the condition to excellent,
- MU's in moderate condition with very high ecological values (i.e. the wetlands and grassy woodlands) are a high priority to improve
- MU's in moderate condition without the very high ecological values are a medium priority with management objective to maintain the current condition,
- MU's in poor and very poor condition are a low priority to manage, the effort should be focussed on maintaining the level of condition and managing threats in these MU's to other areas of the Park.

Definitions

The following definitions apply in relation to the management plan goals:

- Primary vegetation areas – high biodiversity value and good to excellent vegetation condition
- Secondary vegetation areas – high biodiversity value and moderate to good vegetation condition.

The following definitions apply to measure progress towards the objectives in the future:

- "Eradication" of a weed means that the species are no longer present except as seedlings that may continue to germinate and require on-going patrol and control.
- "Reduce weed threat" means to improve the BAM weed score by 3 (e.g. from 2/15 to 5/15)
- "Increase native species cover" means to increase the combined BAM raw score of cover ratings for groundlayer plant life forms by 5; groundlayer plants being the following plant life forms: Shrubs <2m, Forbs, Mat Plants, all Grasses, all Sedges, Ferns and Grass-tree
- "Increase native species diversity" means to increase the BAM weighted native plant species diversity score by at least 5 (i.e. from 20/30 to 25/30).

Core habitat areas were defined in the 2014 plan and for 2024 are proposed to be extended to include zone 8 and 14, with the objective for these areas to improve their condition to "Excellent"

The vegetation condition ratings are based on the Vegetation Condition Score derived from the surveys undertaken for the change assessment described in section 4.

Table 3 Overview of management units, 2024 vegetation condition and priority for management

MU	Vegetation description	Ha	Condition	Priority	Objective
1	Mallee Box and Pink Gum revegetated open woodland	11	Poor	Low	Maintain
2	Exotic herbland	12	Very poor	Lowest	Maintain
3	Drooping Sheoak, Mallee Box and Pink Gum low open woodland	15	Moderate	Medium	Maintain
4	Coastal shrubland and Heath	2	Excellent	Highest (core habitat)	Primary MU: maintain
5	Drooping Sheoak and Pink Gum low woodland	37	Excellent	Highest (core habitat)	Primary MU: maintain
6	Mallee Box woodland	8	Moderate	High (core habitat)	Secondary MU: Improve
7	Pink Gum and Pittosporum	5	Poor to moderate	Medium - high	Secondary MU: Improve
8	Pink Gum and Drooping Sheoak woodland	29	Good	High (core habitat)	Secondary MU: Improve
9	Pink Gum woodland	29	Moderate	Medium	Maintain
10	River Red Gum forest, aquatic herbland, sedgelands and open shrublands	28	Moderate	High	Secondary MU: Improve
11	Pink Gum grading to River Red Gum revegetated woodland	5	Poor	Low	Maintain
12	Exotic grassland/ herbland with Pink Gums and non-local plantings	9	Very poor	Lowest	Maintain
13	Bulrush and Lignum stormwater wetland	1	Moderate	Low	Maintain
14	Drooping Sheoak & Pink Gum low open woodland	26	Good	High	Secondary MU: Improve
15	Pink Gum and Drooping Sheoak low open woodland	22	Moderate	Medium	Maintain
16	Grey Box woodland with Mallee Box	3	Moderate	High	Secondary MU: Improve
17	Drooping Sheoak & Pink Gum low open woodland	15	Moderate	Medium	Maintain
18	Bracken Fern fernland grading to Spiny Flat-sedge sedgeland	8	Very poor	Lowest	Maintain

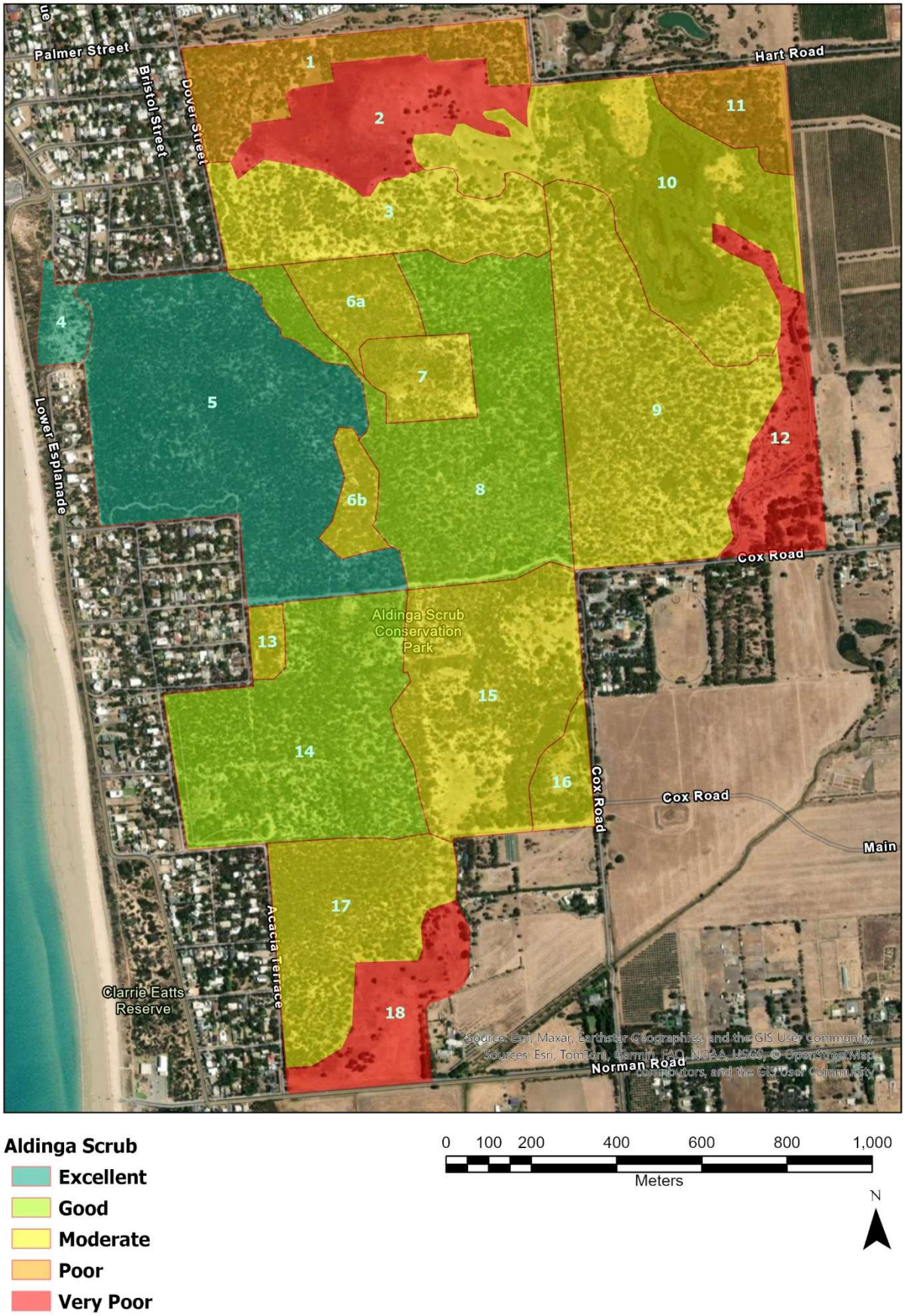


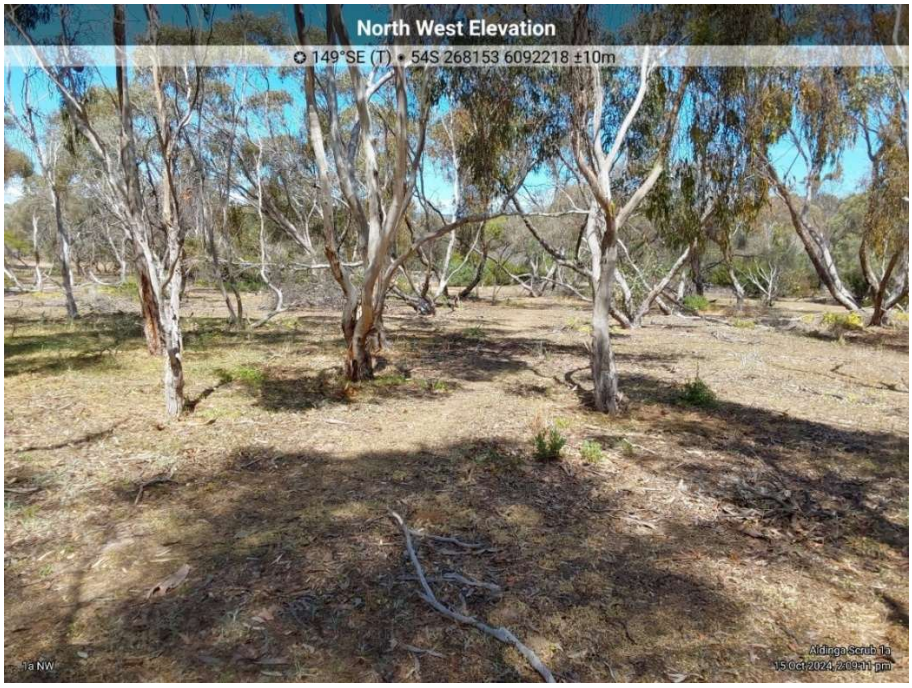
Figure 1 Vegetation condition rating for Vegetation Management Units of Aldinga Scrub

3.1 MANAGEMENT UNIT SUMMARIES

MU 1	Mallee Box and Pink Gum revegetated open woodland
Management priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain the current vegetation condition 2. Reduce weed threat and increase coverage and diversity of native groundlayer species.
Essential Actions	1. Biennial sweep through entire* zone to: - Control isolated high threat weeds: Lippia, Carpetweed, African Daisy (at least prevent seed set), Boneseed - Guard Creeping Boobialla and seedling eucalypts and shrubs (except Seaberry saltbush, Kangaroo Thorn) **If entire zone is not feasible, priority to the most eastern end working westwards*
Supplementary Actions	1. Construct kangaroo-proof exclosure and plant hardy, grazing resistant understorey species as a source for surrounding areas and control other high threat weeds in these. 2. Control other high threat weeds working out from areas of good native understorey. 3. Install nest boxes, monitor for European bees and remove if required

VEGETATION DESCRIPTION AND CONDITION *MU 1 is the 2014 Zone 1a. Refer Appendix A for 2014 Zone locations.*		
2014 Zone 1a	***Mallee Box and Pink Gum revegetated open woodland***	
Vegetation Condition	Poor	
Dominant overstorey	*Eucalyptus porosa*	Mallee Box
	E. fasciculosa	Pink Gum
	E. microcarpa	Grey Box
Dominant native understorey	*Acacia paradoxa*	Kangaroo Thorn
	Rhagodia candolleana	Seaberry Saltbush
	Myoporum insulare	Common Boobialla
	Dodoneaea viscosa ssp. *spatulata*	Sticky Hopbush
Significant species/ communities	SA rare flora: Pink Gum (*E. fasciculosa*); Creeping Boobialla (*M. parvifolium*)	
Management issues	• The area has been revegetated with mostly trees and some larger shrubs since the 1990's; FoAS report that many understorey species have been lost to grazing; the most recent plantings include palatable species planted in wire mesh guards in some of the remaining exotic herbland areas. • Extremely low native understorey biomass mostly comprising Seaberry Saltbush. • Very high weed and grazing pressure which is limiting natural regeneration of the groundlayer. • High kangaroo density with extensive sections of bare ground and disturbed soil. • Lack of structural habitats (tree hollows, vegetation strata diversity).	

MU 1	Mallee Box and Pink Gum revegetated open woodland
	Photopoint for the representative assessment quadrat

MU 2	Exotic herbland
Management priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain the current vegetation condition 2. Increase cover and diversity of native species.
Essential Actions	1. Biennial control of isolated highly invasive weeds (e.g. Bridal Creeper, Gazania)
Supplementary Actions	1. Construct kangaroo-proof exclosure and plant hardy, grazing resistant species as a source for surrounding areas (e.g. Eucalypts, Sweet Bursaria, Muntries, Seaberry Saltbush, Ruby Saltbush) and control other high threat weeds in these. In the longer term more diverse plantings could be established, however, while the current grazing pressure continues most species will not survive outside of exclosures/guards. 2. Control widespread high threat weeds (e.g. Salvation Jane, Cape Weed, Kikuyu) working north and west from the south eastern woodland/sedgelands and perimeter with zone 3, taking care not to over-clear and leave ground bare.

VEGETATION DESCRIPTION AND CONDITION *MU 2 is the 2014 Zone 1b. Refer Appendix A for 2014 Zone locations.*	
2014 Zone 1b	***Exotic herbland***
Vegetation Condition	Very Poor
Emergent low overstorey	*Dodoneaea viscosa* ssp. *spatulata* – Sticky Hopbush *Rhagodia candolleana* – Seaberry Saltbush
Dominant native understorey	*Senecio quadridentatus* – Cotton Groundsel *Vittadinia gracilis* – Woolly New Holland Daisy *Pittosporum angustifolium* – Native Apricot *Muehlenbeckia gunnii* – Coastal Climbing Lignum
Other vegetation associations	Drooping Sheoak (*Allocasuarina verticillata*) very open low woodland over Kangaroo Thorn (*Acacia paradoxa*) over exotic hers and grasses. Recently revegetated areas.
Significant species/ communities	Pink Gum (*E. fasciculosa*): SA rare
Management issues	• Extreme weed and grazing pressure. • Extremely low native biomass, species diversity and habitat structure. • Evidence of wind erosion, given much of the groundcover is annual species that will die-off over summer it is anticipated the zone will be highly vulnerable to further wind erosion. • The southeastern end has larger Sheoaks, sedges and River Red Gums is in slightly better condition and is the priority for management, with a low lying area predominantly Bare Twig-rush sedgeland.

MU 2	Exotic herbland
	Photopoint for the assessment quadrat that represents most of the zone
	Second quadrat surveyed of open Sheoak Woodland

MU 3	Drooping Sheoak with Mallee Box and Pink Gum low open woodland over Bracken, Muntries and sedges
Management priority	Medium

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition 2. Reduce weed threat and maintain native species diversity and cover.
Essential Actions	1. Biennial sweep through zone* to: - Control isolated high threat weeds: Carpetweed & Boneseed. - Guard regenerating Sheoaks and other species from grazing (except Seaberry saltbush, Kangaroo Thorn). ** Ideally the entire zone but if this is not feasible within available resources, work from the southern and western zone boundaries towards the north and east.*
Supplementary Actions	1. Control other high threat weeds (e.g. Bridal Creeper, Perennial Veldgtrass) working out from areas of good native understorey, generally from southern MU boundary and west to east. 2. Confirm identity of possible Sallow Wattle and remove if positive. 3. Plant bare areas with low palatability groundcover species (e.g. Muntries) and very low numbers of canopy species.

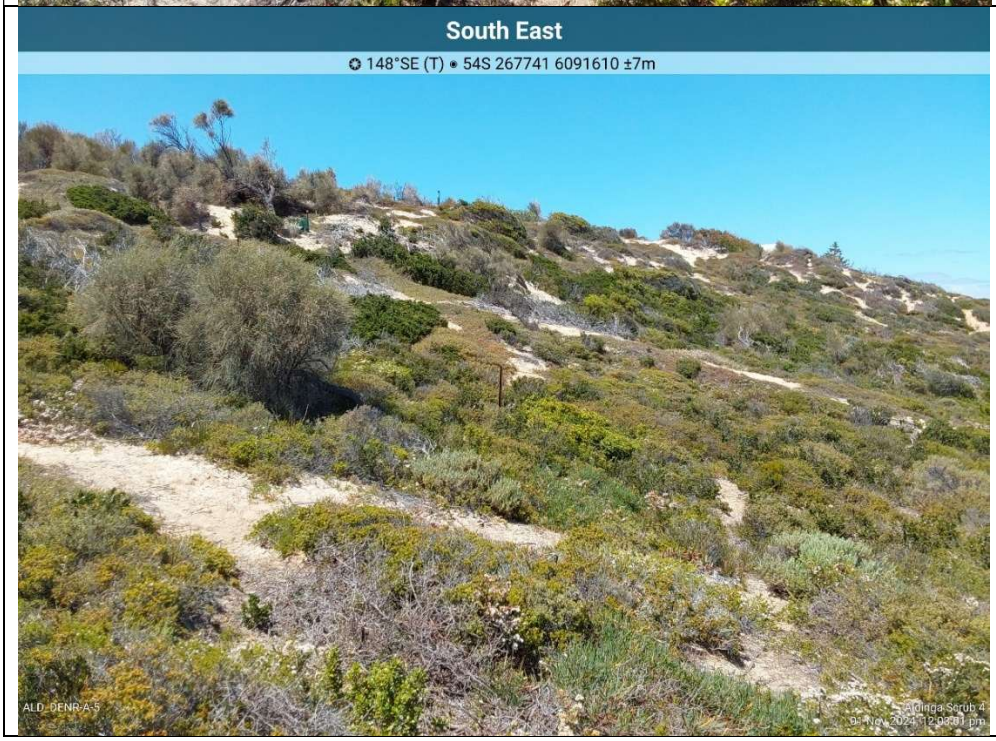
VEGETATION DESCRIPTION AND CONDITION *MU 3 is the 2014 Zone 1c. Refer Appendix A for 2014 Zone locations*		
2014 Zone 1c	***Drooping Sheoak with Mallee Box and Pink Gum low open woodland over Bracken, Muntries and sedges***	
Condition 2024	Moderate	
Dominant overstorey	*Allocasuarina verticillata*	Drooping Sheoak
	Eucalyptus fasciculosa	Pink Gum
	E. porosa	Mallee Box
Dominant native understorey	*Pteridium esculentum ssp. esculentum*	Bracken Fern
	Kunzea pomifera	Muntries
	Lepidosperma congestum	Sword-sedge
	Rhagodia parabolica	Seaberry Saltbush
Other vegetation associations	River Red Gum woodland in low-lying south western area.	
Significant species/ communities	Pink Gum (*E. fasciculosa*): SA rare	
Management issues	• High weed and grazing pressure. • Medium to high native species diversity, cover and structural diversity although some large bare areas. • Evidence of several past fires. • Old stumps indicate there were once quite large eucalypts throughout and there are also a number of large dead Drooping Sheoaks. • South African Diasy and Bridal Creeper are scattered throughout, the latter appear affected by rust. • Possible non-local Sallow Wattle at western end.	

MU 3	Drooping Sheoak with Mallee Box and Pink Gum low open woodland over Bracken, Muntries and sedges
	Photopoint for the assessment quadrat

MU 4	Coastal shrubland and heath
Management priority	High – Core Habitat

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition. 2. Eradicate high threat weeds.
Essential Actions	1. Continue annual patrol for and removal of high threat weeds (Perennial Veldt Grass, African Boxthorn, Boneseed, Pyp Grass, Coastal Tea Tree, Sallow Wattle etc. and any other weeds that may regenerate)
Supplementary Actions	1. Remove old erosion control materials where no disturbance is required. 2. Evaluate options for reducing pedestrian access through zone and implement least impact option if a low impact option is found. 3. Re-monitor BCM site on a five yearly basis.

VEGETATION DESCRIPTION AND CONDITION *MU 4 is the 2014 Zone 4. Refer Appendix A for 2014 Zone locations*		
Zone 4	***Coastal Wattle, Drooping Sheoak & Coast Daisy-bush open shrubland over Muntries and Rolling Spinifex***	
Vegetation Condition	Excellent	
Dominant overstorey	*Acacia longifolia ssp. sophorae*	Coastal Wattle
	Allocasuarina verticillata	Drooping Sheoak
	Olearia axillaris	Coast Daisy-bush
Dominant native understorey	*Kunzea pomifera*	Muntries
	Spinifex hirsutus	Rolling Spinifex
Other vegetation associations	Coastal low heath on lower western slopes	
Significant species/ communities	Pink Gum (E. fasciculosa): SA rare Regionally rare: 8 additional species Regionally vulnerable: 2 additional species	
Management issues	• High threat weeds are still present in low abundance and management of controlled weeds is likely to continue for some years therefore on-going control is still required. • There are old erosion prevention materials (e.g. fence posts and plastic mesh) partially buried in the dunes. There is no need to remove untreated timber, while plastic pollution in the landscape is not ideal, removal of plastic and treated timber should only occur where native vegetation or soil stability will not be disturbed. • Unauthorised pedestrian tracks through the zone, most notably along the northern boundary which is likely people short-cutting from Fraser Avenue – Maurice Street areas to the beach. Constructing steps to connect this area to the existing boardwalk may contain pedestrian access but the negative impacts of the construction (i.e. clearance required) may outweigh the benefits.	

MU 4	Coastal shrubland and heath
	Photopoint for assessment quadrat for the main vegetation association
	BCM ALD-DENR-A-5 photopoint in coastal heath vegetation type with dune vegetation in background.

MU5	Drooping Sheoak and Pink Gum low woodland
Priority	High – Core Habitat

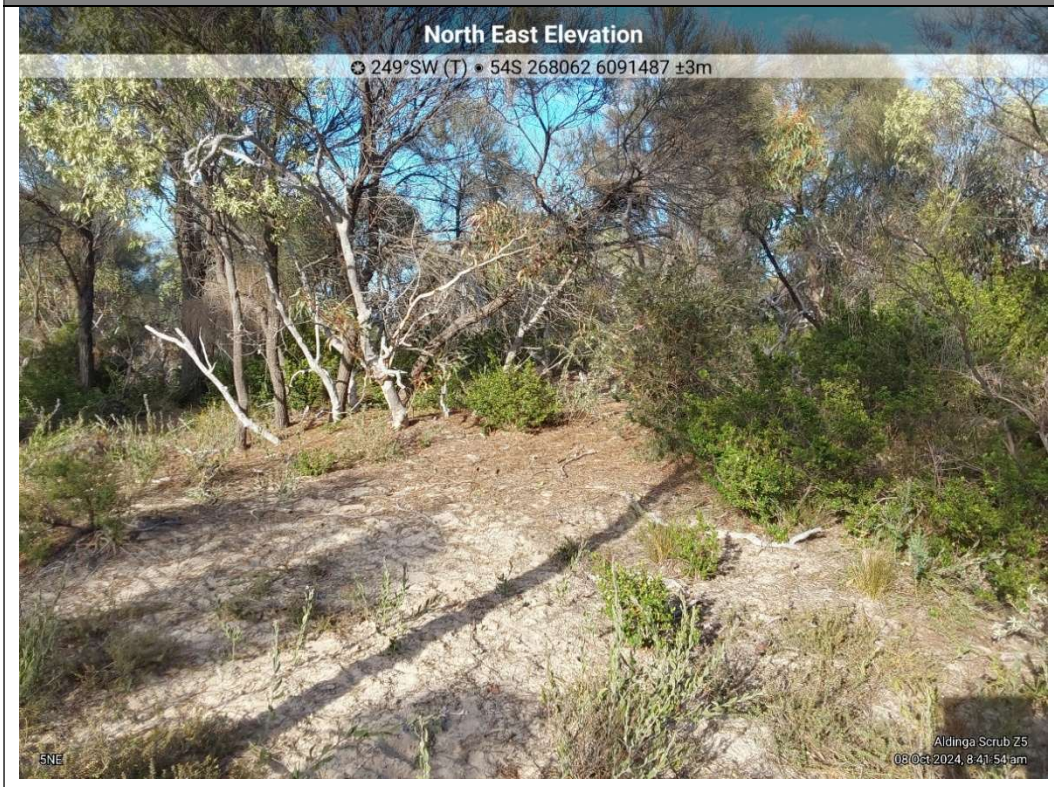
VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition 2. Eradicate isolated high threat weeds.
Essential Actions	1. Maintain threatened species in fenced areas with weeding, monitoring and other actions as required 2. Biennial sweep through zone to: - Control isolated high threat weeds: Boneseed, Rhamnus, *Acacia saligna*, Coast Tea-tree - Guard regenerating Eucalypt, Banksia and other uncommon species 3. Annual patrol for and control of Bridal Creeper in previous control areas and continue to push this and other weed front southwards
Supplementary Actions	1. Ensure soil hygiene measures are implemented for possible Pc. 2. Undertake small ecological burn adjacent to the 2009 burn site to promote regeneration of Wheel Buckbush, monitor and manage re-growth (including post burn weed control and grazing protection for palatable species). 3. Continue to monitor BCM sites but reduce to a five yearly monitoring covering all indicators.

VEGETATION DESCRIPTION AND CONDITION

MU 5 is a combination of 2014 Zones 5, 6 & most of 7. Refer Appendix A for 2014 Zone locations. Vegetation Description and Condition Assessments for these 2014 Zones follow.

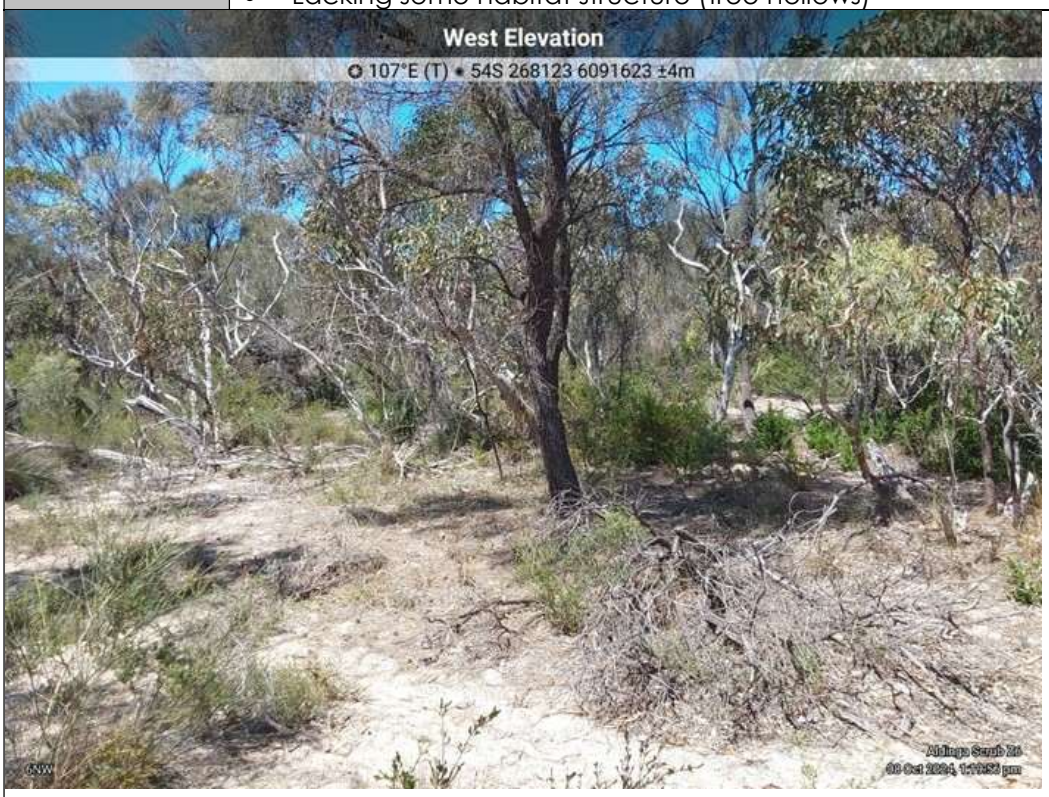
2014 Zone 5	***Drooping Sheoak and Pink Gum low woodland***
Vegetation Condition	Excellent
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum *Acacia pycnantha* – Golden Wattle
Dominant native understorey	*Alyxia buxifolia* – Sea Box *Thomasia petalocalyx* – Paper-flower *Calytrix tetragona* – Common Fringe-myrtle *Kunzea pomifera* – Muntries *Helichrysum leucopsideum* – Satin Everlasting
Significant species/ communities	SA rare Pink Gum (E. fasciculosa) SA & regionally endangered: Aldinga Dampiera (*Dampiera lanceolata var. intermedia*) Lacy Coral Lichen (*Cladia fernandii*) Regionally rare: 4 additional species Regionally vulnerable: 1 additional species
Management issues	• Population of Lacy Coral Lichen is fenced off (this area was not surveyed) • Very high native species and plant life forms diversity • Low cover of weeds but scattered highly invasive weeds • Lacking some habitat structure (tree hollows)

MU5	Drooping Sheoak and Pink Gum low woodland

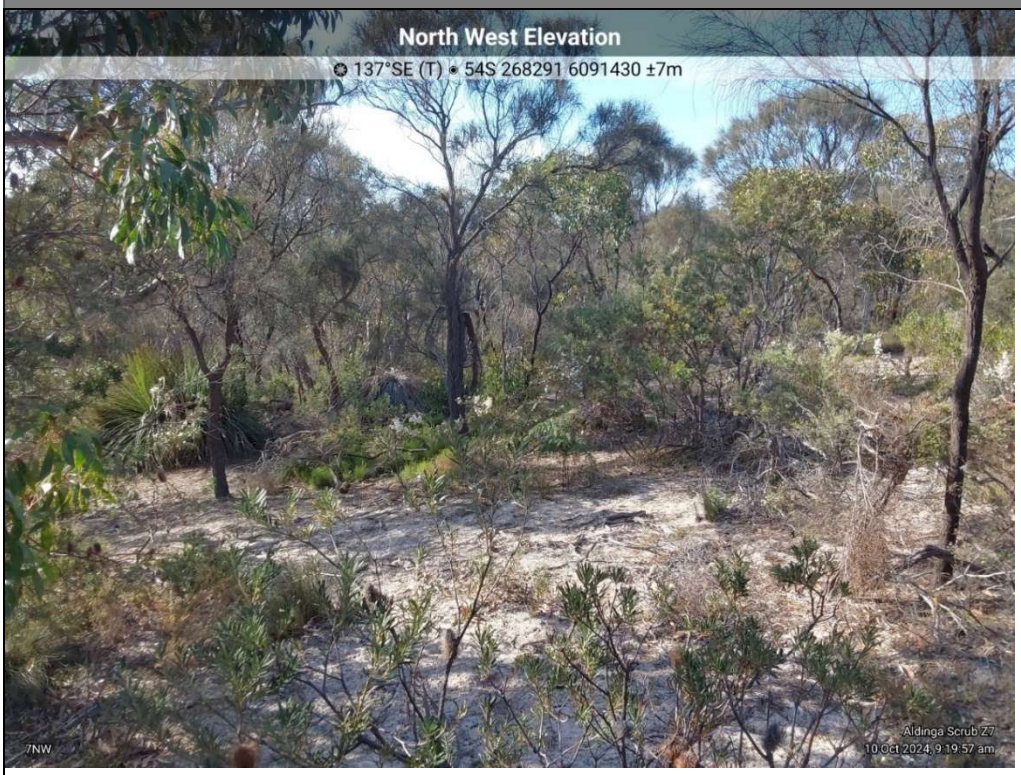


Photopoint for assessment quadrat for 2014 zone 5, now part of Management Unit 5

2014 Zone 6	*Drooping Sheoak and Pink Gum low woodland*
Vegetation Condition	Excellent
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant native understorey	*Calytrix tetragona* – Common Fringe-myrtle *Kunzea pomifera* – Muntries *Lepidosperma canescens* – Hoary Rapier-sedge
Significant species/ communities	SA rare Pink Gum (E. fasciculosa): SA and regionally endangered: Aldinga Dampiera (*Dampiera lanceolata var. intermedia*) Regionally rare: 4 additional species Regionally vulnerable: 2 additional species This zone is also known to contain significant orchids however they were not observed in the assessment (including SA endangered: Goldsack's Leek-orchid (*Prasophyllum tortilis*) – not observed in surveys but present in fenced-off areas).
Management issues	• There are two BCM sites in northern area, monitoring by the FoAS since 2005 has shown this high-quality site has been maintained in good to excellent condition for most indicators except for tree condition and weed threat which is poor at the northern site and very poor in the southern site, while grazing pressure varies across years (NCSSA 2021). • A population of the SA endangered Goldsack's Leek-orchid (*Prasophyllum tortilis*) has been fenced off, this area contains higher Veldtgrass biomass than surrounding areas. • Some Showy Parrot Peas (*Dylwinia hispida*) near a track have also been guarded to protect them from grazing

MU5	Drooping Sheoak and Pink Gum low woodland
	• Presence of highly invasive Bridal Creeper in low abundance and Perennial Veldtgrass in moderate cover • Dieback of some large Yackas. • Mallee Box common on lower lying areas. • Lacking some habitat structure (tree hollows)
	Photopoint for assessment quadrat for 2014 zone 6, now part of MU 5 Note: this should be the photopoint for future monitoring of MU5

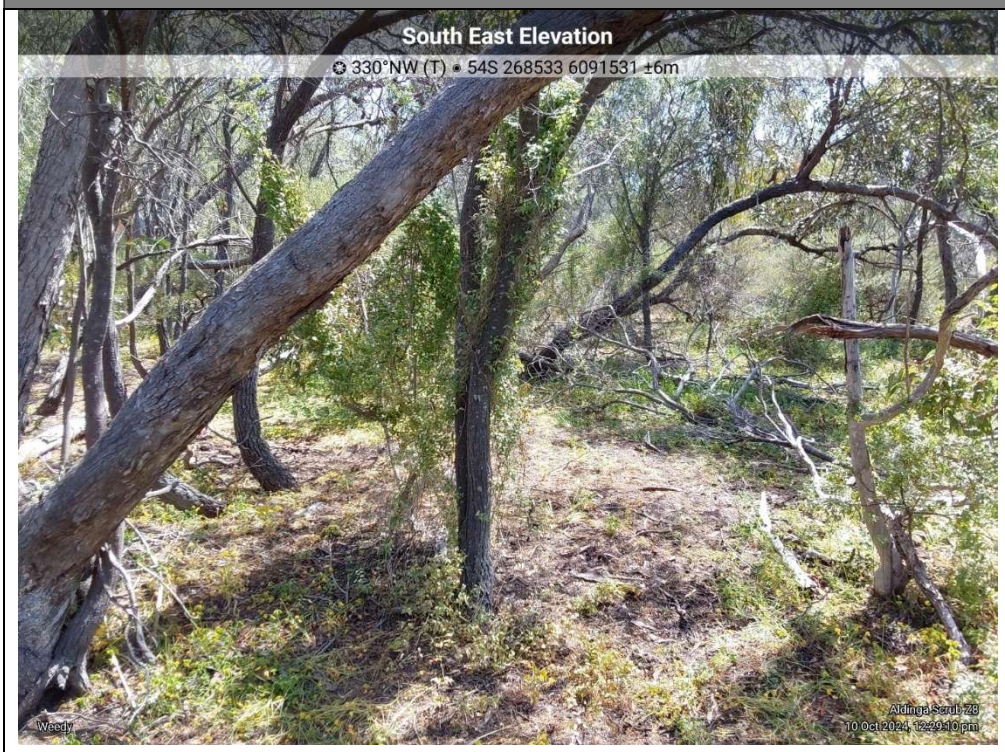
2014 Zone 7	*Drooping Sheoak low woodland*
Vegetation Condition	Excellent
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant understorey	*Calytrix tetragona* – Common Fringe-myrtle *Xanthorrhoea semiplana ssp. tateana* – Tate's Grass-tree *Kunzea pomifera* – Muntries *Acacia pycnantha* – Golden Wattle
Significant species/ communities	SA rare: Pink Gum (*E. fasciculosa*) and Tate's Grass-tree (*Xanthorrhoea semiplana ssp. tateana)* This MU is known to contain significant orchids however they were not targeted as part of the survey. SA endangered: Aldinga Dampiera (*Dampiera lanceolata var. intermedia*) Regionally rare: 3 additional species Regionally vulnerable: 2 additional species
Management issues	• Grassy weeds along Boomerang Track. • Fenced off area for threatened orchids with more biomass of Perennial Veldtgrass. • Most Pink Gums are in poor health with more than 70% dieback.

MU5	Drooping Sheoak and Pink Gum low woodland	
		Photopoint for assessment quadrat for 2014 zone 7, now part of MU 5

MU6 Mallee Box woodland	
Priority	High – Core Habitat

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve current vegetation condition 2. Reduce weed threat.
Essential Actions	1. Annual control program for Bridal Creeper in conjunction with adjacent zone 5, pushing the weed front from south to north in 6a and north to south in 6b. 2. Biennial sweep through zone to control isolated woody weeds.
Supplementary Actions	1. Spot weed soursobs working form areas of higher native groundcover or spot weeding around isolated native plants 2. Revegetate with native grasses and groundcovers (e.g. local native *Rytidosperma spp., Austrostipa spp., Einadia nutans, Lomandra* spp., Vittadinia spp., *Acaena echinata, Imperata cylindrica*) to create a seed source, protect from grazing and spot weed around. 3. Establish BAM site in zone to include with future monitoring.

VEGETATION MANAGEMENT 2025 – 2030 *MU 6 is a combination of areas within 2014 Zones 7 & 8. Refer Appendix A for 2014 Zone locations* *The following additional description applies to MU 6 with the Vegetation Description based on a ramble survey of the two areas.*		
Vegetation Condition	Moderate	
Dominant overstorey	*Eucalyptus porosa*	Mallee Box
Dominant native understorey	*Pittosporum angustifolium*	Native Apricot
	Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush
	Thomasia petalocalyx	Paper-flower
Description & Notes	Not surveyed using BAM method. This vegetation type occurs in two discrete areas, 6a & 6b (although there are smaller pockets of this association through other MU's on heavier soils). 6a is a larger area and in better condition generally, with higher native understorey cover and diversity, but becoming poorer in the northwestern end. Fatchen (1989) describes these areas from Karaehenbuehl in 1973 as "a largely herbaceous groundcover… rather than heath species, grasses are the major ground cover, with several [*Austrostipa*] and [*Rytidosperma]* species common together with *Imperata [cylindrica*]… Mid-dense to dense secondary shrub layers are frequent, particularly on the lowest lying ground…: *Pittosporum [angustifolium], Santalum acuminatum, Santalum murrayanum, Acacia [paradoxa] and Acacia [acinacea*] form thickets 2-3m high within E. porosa areas". The trees are mostly in good health and have a higher proportion of hollows than surrounding vegetation. The main high threat weeds are Bridal Creeper and Sour Sobs.	

MU6 Mallee Box woodland	
	Representative photograph of MU 6a showing weedy understorey.

MU7 "Pittosporum Paddock" – Pink Gum and Native Apricot	
Priority	Medium – High (the swampy area is considered highest priority within the zone)

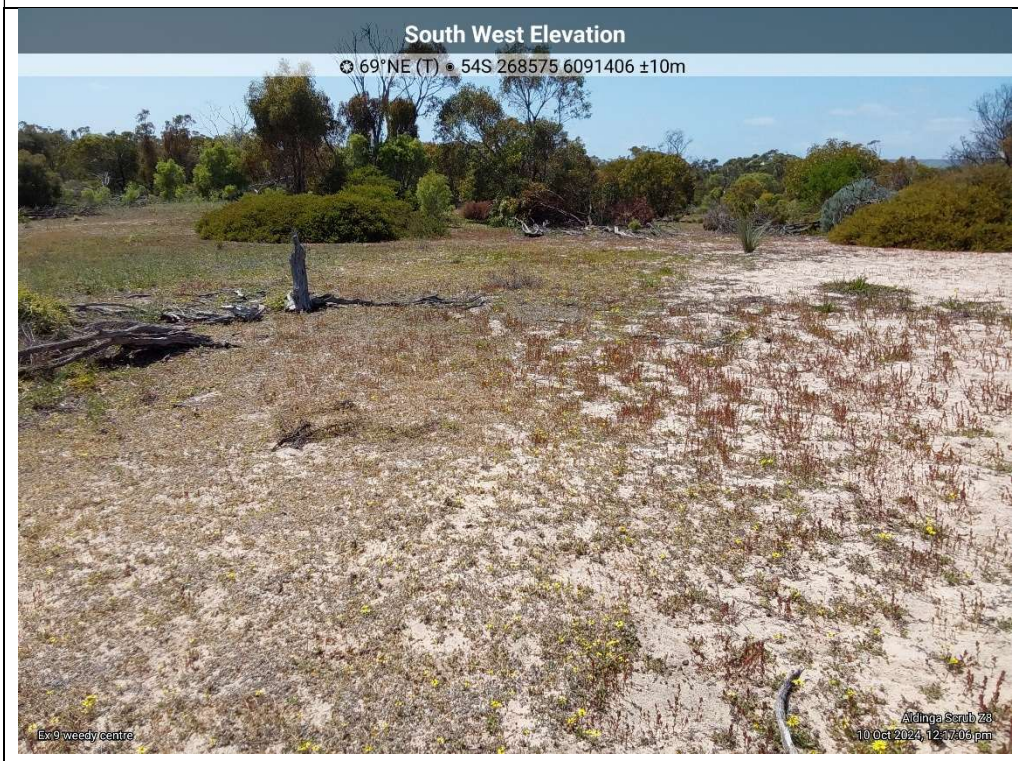
VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve current vegetation condition. 2. Eradicate isolated high threat weeds.
Essential Actions	1. Annual monitoring for and control program for Bridal Creeper in conjunction with adjacent zones (6b and 8). 2. Biennial sweep through zone to control isolated woody weeds (Boneseed, Olives).
Supplementary Actions	1. Control other herbaceous and grassy weeds to facilitate the regeneration of native species, working from the outer edges of the zone and closing in over the central bare area. 2. Revegetate in damp soils with lost species: Prickly Tea-tree (*Leptospermum continentale*), recorded by Fatchen (1989), taking care not to damage native species, to create a seed source; protect from grazing and spot weed around. 3. Establish BAM site (small zone) or BCM site in zone to include with future monitoring. 4. The middle and southern areas could be fenced off with minimal impact on native vegetation to create a new kangaroo exclosure if sufficient resources are available, noting that a higher level of weed management would be required in the fenced off area.

VEGETATION MANAGEMENT 2025 – 2030

MU 7 is a combination of all of 2014 Zone 9 and a small part of 2014 Zone 8. Refer Appendix A for 2014 Zone locations.

Vegetation Description and Condition Assessment for Zone 9 follows based on a ramble survey of the area.

2014 Zone 9	*Pink Gum and Native Apricot*	
Vegetation Condition	Poor to Moderate	
Dominant overstorey	*Eucalyptus fasciculosa*	Pink Gum
Dominant understorey	*Pteridium esculentum*	Bracken Fern
	Acacia pycnantha	Golden Wattle
	Pittosporum angustifolium	Native Apricot
	Rytidosperma sp.	Wallaby Grass
	Eutaxia microphylla	Common Eutaxia
Description & Notes	Although mostly degraded due to past clearance, this zone contains a distinct assemblage of species in the northwestern corner associated with damp swampy soil (noted in Fatchen 1989), including Black Bristle-brush (*Chorizandra enodis,* only observed location), Common Eutaxia (*Eutaxia microphylla*), and Pale Fanflower (*Scaevola albida*). Adjacent to the swampy area and to the south and east are regenerating Native Apricot and one of the only areas of regenerating Pink Gum and a relatively high abundance of Wallaby grass and New Holland Daisy compared with other parts of the Scrub. The southern half is degraded Pink Gum and Drooping Sheoak woodland (a degraded version of Zone 8), with abundant herbaceous weeds (e.g. Salvation Jane, Capeweed)	

MU7 "Pittosporum Paddock" – Pink Gum and Native Apricot	
	that appears to be gradually recovering with Muntries, Bracken Fern and Golden Wattle regeneration. Part of the area has been used as a 'nursery' for bridal creeper rust fungus (*Puccinia myrsiphylli*) and leafhopper (*Zygina* sp.), however the FoAS report that this area has now had most Bridal Creeper controlled.
	Representative photograph of MU 7
	More degraded area of MU 7 to the southwest of the above photograph

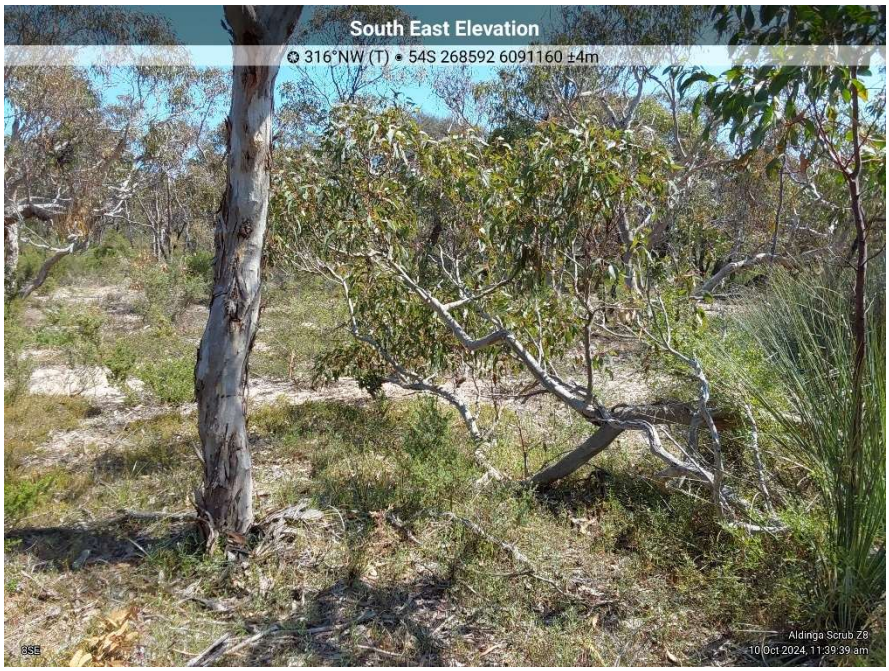
MU 8 Pink Gum and Drooping Sheoak woodland	
Priority	High – Core Habitat

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve current vegetation condition. 2. Reduce weed threat and maintain native species diversity and cover.
Essential Actions	1. Maintain threatened species in fenced areas with weeding, monitoring and other actions as required. 2. Biennial sweep through entire zone to control isolated high threat weeds: Boneseed, African Daisy, Rhamnus 3. Annual patrol for and control of Bridal Creeper and other high threat weeds in previous control areas, containing spread from zone 6a, 6b and pushing north towards 3, east towards 9 and south towards 15. 4. Ensure soil hygiene measures implemented for possible Pc.

VEGETATION DESCRIPTION AND CONDITION

MU 8 is most of the 2014 Zone 8. Refer Appendix A for 2014 Zone locations.

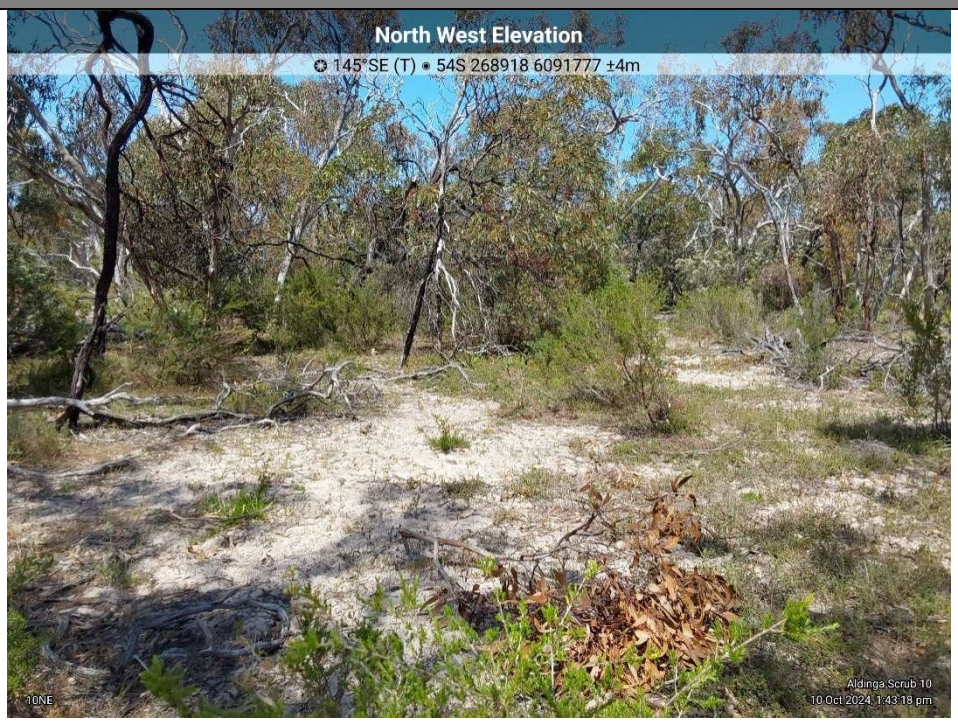
2014 Zone 8	*Pink Gum and Drooping Sheoak woodland*
Vegetation Condition	Good
Dominant overstorey	*Eucalyptus fasciculosa* – Pink Gum *E. porosa* – Mallee Box *Allocasuarina verticillata* – Drooping Sheoak
Dominant understorey	*Xanthorrhoea semiplana* ssp. *semiplana* – Yacca *Calytrix tetragona* – Common Fringe-myrtle *Acacia pycnantha* – Golden Wattle *Lepidosperma canescens* – Hoary Rapier-sedge
Other vegetation associations	Mallee Box (*E. porosa*) woodlands: on heavier soils. Native Apricot (*Pittosporum angustifolium*) and Golden Wattle (*Acacia pycnantha* tall open shrubland in "the Pittosporum Paddock"
Significant species/ communities	SA rare Pink Gum (E. fasciculosa), Tate's Grass-tree (*Xanthorrhoea semiplana ssp. tateana*) Nationally critically endangered: Copper beard-orchid (*Calochilus cupreus*) – not observed in surveys but present in fenced-off areas Regionally rare: 6 additional species Regionally vulnerable: 1 additional species
Management issues	• The previous management plan recommended the amalgamation of zones 8 and 9 however the two areas were found to be quite distinct, with ex-zone 9 (new zone 7) in poorer condition and therefore it is recognised as a separate zone for management in section 7. • The Mallee Box woodland area (new Zone 6) is in poorer condition than the assessment area, with abundant Soursobs and Bridal Creeper. • Mallee Box and Drooping Sheoak were considered healthy but Pink Gums are mostly in moderate health (between 30 to 70% dieback). • A large area in the north east of the zone was fenced off to protect threatened orchids in 2016. This zone now contains more abundant and diverse native herbs, including Chocolate lilies and Bluebells but also abundant growth of Perennial Veldtgrass. • Given the improvements in condition achieved in the previous core habitat zones in the previous years, this zone is now considered a high priority for

MU 8 Pink Gum and Drooping Sheoak woodland	
	management to increase the condition to Excellent and incorporate as a "core habitat" area.
	Photopoint for the assessment quadrat

MU 9 Pink Gum woodland	
Priority	Medium

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition 2. Reduce weed threat and maintain native species diversity and cover.
Essential Actions	1. Biennial sweep through zone to: - Control isolated high threat woody weeds including Sydney Coastal Wattle, Rhamnus and African Daisy - Guard regenerating Eucalypt, Banksia and other uncommon species 2. Maintain fenced areas with weeding, especially Perennial Veldt grass. 3. Control Bridal Creeper, working from eastern boundary with zone 8 and northern boundary with wetlands (zone 10) towards the south and east.
Supplementary Actions	1. Continue to monitor BCM sites but reduce to a five yearly monitoring covering all indicators. 2. Control other high threat weeds (e.g. Perennial Veldt grass) working from north and west to south and east. 3. Consider undertaking another ecological burn away from sensitive features with follow-up fencing to protect regeneration if resources are available.

VEGETATION DESCRIPTION AND CONDITION *MU 9 is most of 2014 Zone 10. Refer Appendix A for 2014 Zone locations.*	
2014 Zone 10	***Pink Gum woodland***
Vegetation Condition	Moderate
Dominant overstorey	*Eucalyptus fasciculosa* – Pink Gum *Acacia pycnantha* – Golden Wattle
Dominant native understorey	*Kunzea pomifera* – Muntries *Rhagodia candolleana* – Seaberry Saltbush
Other vegetation associations	Weedy open shrubland along western and southern boundary. River Red Gum regeneration and sedgelands in low lying areas adjoining the wetland.
Significant species/ communities	SA rare: Pink Gum (*E. fasciculosa*) Regionally rare species: 1 additional species The zone contains an unusually large tree that has not been able to be identified, including by Eucalypt expert Dean Nicolle (FoAS pers. com 2024).
Management issues	• The zone condition deteriorates to the east and south becoming dominated by exotic species. • Heavy grazing pressure with 'browse lines' is noticeable on taller palatable species and smaller shrubs are heavily pruned. It is likely that the decline in condition is largely due to the grazing pressure causing a decline of groundlayer species and lack of successful recruitment. The BCM monitoring does not detect this as it partly relies on palatable species being present to be grazed, but once lost they are not considered in the monitoring method. • An area in the southwestern corner was fenced off following a controlled burn in 2011 to protect regeneration. This zone contains higher native groundlayer cover and diversity but also more abundant Perennial Veldtgrass biomass. • The health of Pink Gums at the BAM site was moderate (with 30-70% dieback, however their condition improves towards the wetland areas.

MU 9 Pink Gum woodland	
	Photopoint for the assessment quadrat

MU10 River Red Gum forest, aquatic herbland, sedgelands and open shrublands	
Management priority	High

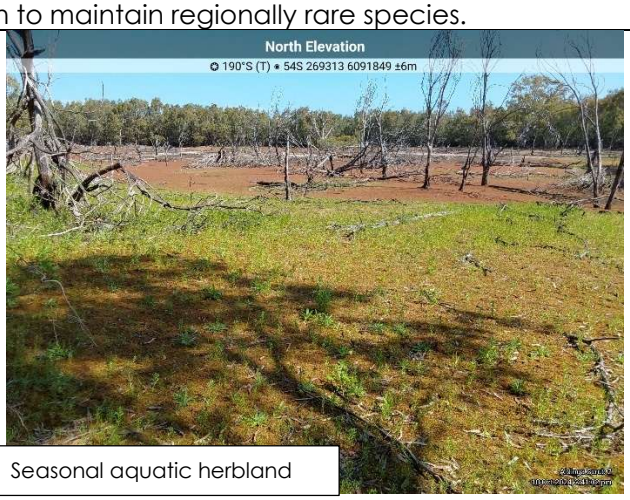
VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve the vegetation condition 2. Reduce weed threat 3. Maintain populations of Nardoo (*Marsilea drumondii*) and Blue Rod (*Stemodia florulenta*). 4. Increase the cover and diversity of native understorey species.
Essential Actions	1. Biennual sweep through zone to control isolated high threat weeds: Rose, Olive, African Daisy 2. Annual follow- up monitoring for and control of Bridal Creeper *3.* Implement EA (2012) environmental water requirements recommendations 1 & 2
Supplementary Actions	1. Monitor for and control wetland and other environmental weeds e.g. Aster Weed, Slender Thistle and Carpetweed (note only very high threat weeds to be controlled in high ground areas where the priority is to maintain groundcover). 2. Strategic revegetation (with grazing protection) to improve cover and diversity including: a. Re-introduce missing/low abundance wetland species from best local sources: e.g Prickly Tea-tree (*Leptospermum continentale*), Black Bristle-sedge (*Chorizandra enodis*) and Coastal or Chaffy Cutting Grass* (*Gahnia trifida, G. filum)* into seasonally waterlogged sedgelands b. Improve diversity around margins: e.g. Silver Banksia, Sweet Bursaria and Creeping Boobiala c. Grazing resistant groundcover on high ground e.g. Muntries, Seaberry Saltbush, Ruby Saltbush

*In this region *G. trifida* tends to be associated with lower salinity inland wetlands and *G. filum* with higher salinity coastal wetlands; the latter is widespread in The Washpool.

VEGETATION DESCRIPTION AND CONDITION *MU 10 is most of 2014 Zone 2. Refer Appendix A for 2014 Zone locations.*		
2014 Zone 2	***River Red Gum forest, aquatic herbland, sedgelands and open shrublands***	
Vegetation Condition	Moderate	
Dominant overstorey	*Eucalyptus camaldulensis ssp. camaldulensis*	River Red Gum
Dominant native understorey	*Typha domingensis*	Bulrush
	Juncus pallidus	Pale Rush
Significant species/ communities	SA endangered ecosystem: freshwater wetlands Nardoo (*Marsilea drummondii*) near threatened regionally; Blue-Rod (*Stemodia floribunda*) not recorded elsewhere in the region, it is common along the River Murray and there is only one other record in the region at Glenelg (in revegetation from stock collected from Aldinga Scrub (M. Endacott, City Holdfast Bay and Green Adelaide, pers. comm. 11/05/25)	
Management issues	• Zone 2 has developed into at least 4 vegetation associations in addition to open water areas: o River Red Gum forest over rushes fringing wetland – the BAM represents this vegetation type o Aquatic herblands of Common Sneezeweed, Knotweeds and Red Milfoil	

MU10 River Red Gum forest, aquatic herbland, sedgelands and open shrublands	
	○ Sedgelands of Bare Twig-rush and Spiny Flat-sedge with emergent dryland shrubs ○ Low open shrublands on high ground areas • Changes to hydrology causing shifts in lower lying vegetation associations (discussed further in section 4.4). • Higher ground areas appear to be very heavily grazed, with low groundcover levels (<50% in some areas) and little native vegetation; there is a high risk of wind erosion in these areas. • The Friends have been planting high ground areas with large mesh guards for plant protection recently engaged contractors to remove isolated woody weeds and Bridal Creeper in the northwestern corner. • Regionally rare Nardoo (*Marsilea drumondii*) and Blue Rod (*Stemodia florulenta*) are present in certain locations, they are reliant on maintaining wetting/drying regime but otherwise the populations appear stable. • Mass regeneration of River Red Gums occurred following the introduction of stormwater to the wetlands and has resulted in a dense forest of River Red Gums fringing some of the wetlands. In time these trees may begin to self-thin (i.e. some will die while others grow), and/or there may be on-going changes in understorey species composition due to changes in light and moisture availability. Monitoring of understorey vegetation (as per EA 2012 and whole of site recommendations in Section 2.3) should be used to guide any further management of vegetation to maintain regionally rare species.

River Red Gum forest over rushes



Seasonal aquatic herbland

Very open shrubland over exotic grasses and herbs

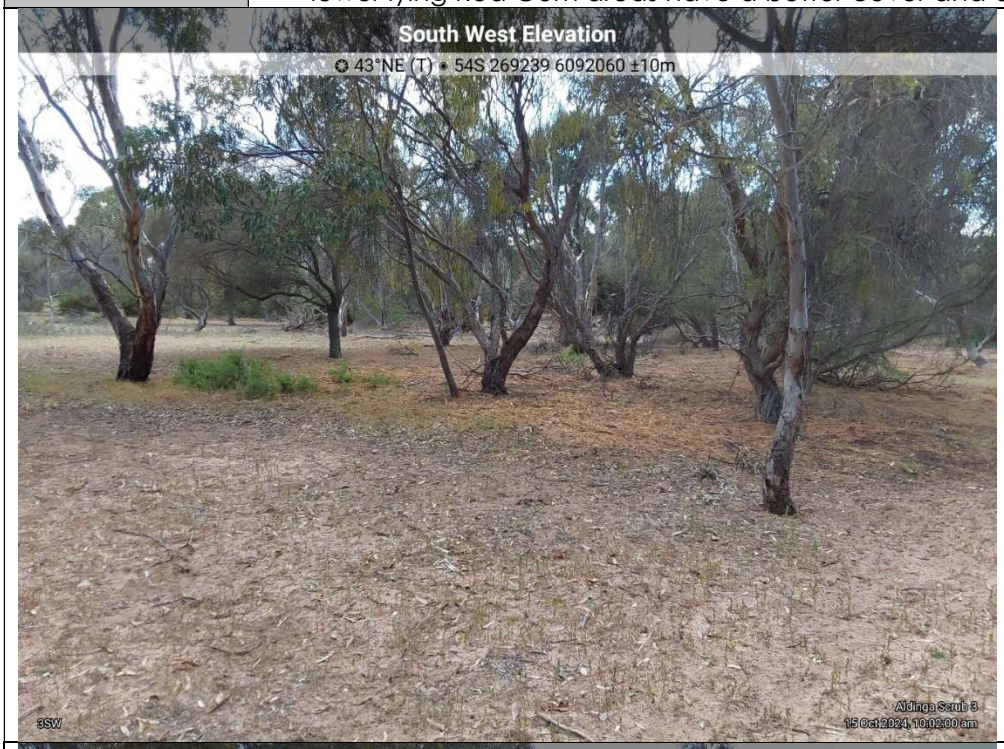
Sedgeland with emergent dryland shrubs

	Example of a sedgeland in an area that was part of the 2014 zone 10

MU11	Pink Gum grading to River Red Gum revegetated woodland
Management priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current condition 2. Maintain populations Blue Rod (*Stemodia florulenta*). 3. Reduce weed threat and increase coverage and diversity of native groundlayer species.
Essential Actions	*1.* Biennial sweep through entire zone to *a.* Control isolated high threat weeds: including Bridal Creeper, Carpetweed, African Daisy and Olives, and non-local natives from historic plantings. *b.* Guard regenerating Mallee Box and other palatable species.
Supplementary Actions	*1.* Gradually control other high threat weeds working out from areas of higher native cover (including where Blue Rod occurs) and the boundary with zone 10 (wetland). 2. Install large nestboxes to encourage possums into the area to eat Mistletoe (monitor for European Bee occupation and remove if that occurs). 3. Strategic revegetation (with grazing protection) to improve understorey cover and diversity (focussed on establishing red Gum Swamp in low lying areas and Mallee Box woodland on higher ground) including: a. Silver Banksia, Sweet Bursaria, Prickly Tea-tree and Creeping Boobiala on margins of damp areas, b. Grasses (e.g. *Rytidosperma*), Ruby Saltbush, Climbing Saltbush (*Einadia nutans*) on higher ground.

VEGETATION DESCRIPTION AND CONDITION *MU 11 is most of 2014 Zone 3. Refer Appendix A for 2014 Zone locations.*		
2014 Zone 3	***Pink Gum grading to River Red Gum revegetated woodland***	
Vegetation Condition	Poor	
Dominant overstorey	*Eucalyptus fasciculosa*	Pink Gum
	Allocasuarina verticillata	Drooping Sheoak
	E. camaldulensis ssp. camaldulensis	River Red Gum
	Melaleuca lanceolata	Dryland Tea-tree
Dominant native understorey	*Acacia paradoxa*	Kangaroo Thorn
	Juncus spp.	Rushes
Significant species/ communities	Pink Gum (E. fasciculosa): SA rare Regionally undocumented species *Stemodia florulenta;* regionally threatened *Melaleuca lanceolata* (rare, planted)	
Management issues	• Area revegetated with local and non-local trees and shrubs over 30 years, with no recent plantings. • This zone is probably affected by changes in the hydrology of the adjacent wetlands increasing soil moisture in lower lying areas and also increasing kangaroo grazing pressure. • Bridal Creeper in low abundance but scattered throughout zone. • Most trees have some die-back (30 – 70%) and high abundance of Box Mistletoe that may be affecting tree health; there are no tree hollows and therefore little habitat for possums.	

	• Low native understory biomass and species diversity mostly, however the lower lying Red Gum areas have a better cover and diversity.
	Dominant Pink Gum vegetation zone, photopoing for assessment quadrat
	River Red Gum over aquatic sedges and herbs in lower lying area at eastern edge

MU12 Exotic grassland/ herbland with Pink Gums and non-local plantings	
Priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Reduce the weed threat to other parts of the scrub. 2. Maintain current condition.
Essential Actions	1. Control high threat weeds with potential to spread to adjacent zones, with priority to preventing seed set and working away from boundary the with zone 8: Bridal Creeper, Olives, Onion Weed (along track), Cottonbush and Peppercorn Tree.
Supplementary Actions	1. Guard natural regeneration 2. Remove remaining large exotic (Pine, Conifer, Yucca) and weedy native plantings (Myoporum sp. Platypus Gum, Cootamundra Wattle, *Melaleuca nesophila*) 3. Gradually control other high threat weeds (e.g. Perennial Veldtgrass, Carpetweed), spot weeding around natives and working out from the boundary with zone 8, taking care not to leave bare soil. 4. Plant bare areas with low palatability and/or self-regenerating groundcover species (e.g. Sweet Bursaria, Golden Wattle, Muntries, Sea-berry Saltbush, Ruby Saltbush, *Rytidosperma* sp.) and very low numbers of canopy species, using appropriate guards.

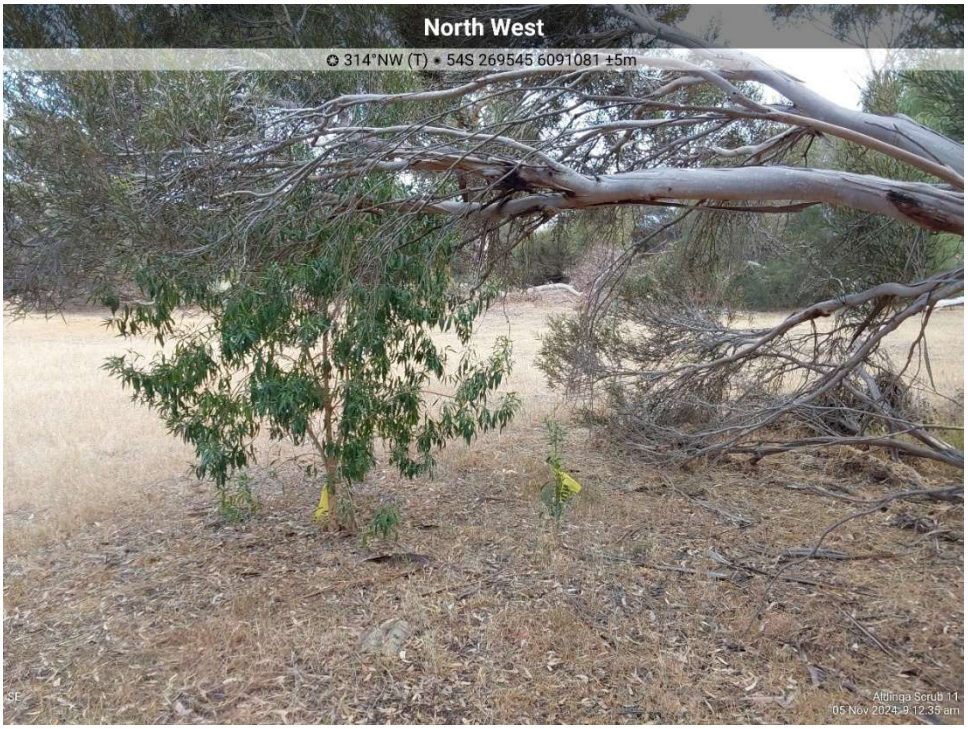
VEGETATION DESCRIPTION AND CONDITION

MU 12 is a combination of all of 2014 Zone 11 and part of 2014 Zone 10. Refer Appendix A for 2014 Zone locations.

Vegetation Description and Condition Assessment for 2014 Zone 11 follows and for 2014 Zone 10 is presented in the Summary of MU 9 (above).

2014 Zone 11	***Non-local Eucalyptus and Paperbark over exotic grasses in extremely poor condition***
Vegetation Condition	Very poor
Dominant overstorey	*Eucalyptus spp.** – Eucalypts *E. cladocalyx ssp. cladocalyx** – Sugar Gum
Dominant native understorey	*Rhagodia candolleana* – Seaberry Saltbush *Enchylaena tomentosa ssp tomentosa* – Ruby Saltbush
Significant species/ communities	SA rare: Pink Gum (*E. fasciculosa*) Regionally threatened *Melaleuca brevifolia* (vulnerable) and *Melaleuca lanceolata* (rare), both planted
Management issues	• FoAS have undertaken revegetation using "paddock tree" guards in the western area to extend the native cover from MU9. • Very high weed pressure. • Lacking in native species diversity & biomass. • Lacking habitat structure (tree hollows, mature local trees), the available habitat structure is due mostly to plantings of non-local species and therefore their removal is not recommended until replacement habitat is available, except where the species are a weed risk. • Similar to areas north of this zone on the eastern edge of zone 10.

MU12 Exotic grassland/ herbland with Pink Gums and non-local plantings



Photopoint for the representative assessment quadrat showing non-local eucalypts over exotic annual grass

Weedy open shrubland previously included in the 2014 zone 10

MU13	Constructed Stormwater Treatment wetland
Priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current condition.
Essential Actions	1. Monitor for and control high threat weeds (including Rhamnus on adjacent land)
Supplementary Actions	1. Clarify site ownership, boundaries and responsibility and communicate to stakeholders. 2. Maintain wetland as required for stormwater and biodiversity outcomes.

VEGETATION DESCRIPTION AND CONDITION *MU 13 is part of 2014 Zone 12. Refer Appendix A for 2014 Zone locations.*	
2014 Zone 12	***Lignum over Bulrush with fringing Drooping Sheoaks, Mallee Box and Grey Box***
Vegetation Condition	Moderate
Dominant native species	*Typha domingensis* – Bulrush *Duma florulenta* – Lignum
Management issues	• The previous plan notes that Bulrush control had occurred prior to 2014 to maintain a diversity of other sedges and rushes however this no longer occurs. • Lack of clarity around land ownership and responsibility – the stormwater wetland is largely within the Alding CP boundary with a small section of council land north of this; the FoAS report they do not work in this area

Constructed wetland inlet

MU13	Constructed Stormwater Treatment wetland
	Constructed wetland

MU 14	Drooping Sheoak & Pink Gum low open woodland
Priority	High

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve vegetation condition. 2. Conserve and promote threatened species (Sticky Daisy-bush and Aldinga Dampiera) populations. 3. Reduce weed threat and increase the cover of native groundlayer species.
Essential Actions	1. Biennial sweep through zone to control isolated high threat weeds (including Acacia saligna, Boneseed, Olives, Freesia, Galenia, non-native Pigface). 2. Monitor and maintain Sticky Daisy-bush, including continue to weed, guard (especially any regeneration) and propagate and transplant into adjacent areas on similar soils to increase the population (in consultation with regional threatened flora ecologist). 3. Continue to plant, protect and monitor Aldinga Dampiera and Sticky Daisy-bush. 4. Control Bridal Creeper, working from north and west to southern and eastern boundaries of the zone. 5. Control Onion Weed and Scabiosa along the old extension of Red Gum Avenue. 6. Maintain fenced areas with weeding, especially Perennial Veldtgrass.
Supplementary Actions	1. Control other high threat weeds (e.g. Perennial Veldtgrass) working from north and west to southern and eastern boundaries of the zone. 2. Monitor for grazing of natural regeneration and guard if required. 3. Install artificial hollows, monitor for European bees and remove if this occurs.

VEGETATION DESCRIPTION AND CONDITION

MU 14 is all of 2014 Zones 13, 15 and 16 and part of 2014 Zone 12. Refer Appendix A for 2014 Zone locations.

Vegetation Description and Condition Assessment for 2014 Zones 13, 15 and 16 follows and for 2014 Zone 12 (wetland) is presented in the Summary of MU 13 (above).

2014 Zone 13	*Drooping Sheoak & Pink Gum low open woodland*
Vegetation Condition	Good
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant understorey	*Calytrix tetragona* – Common Fringe-myrtle *Rhagodia candolleana* – Seaberry Saltbush *Kunzea pomifera* – Muntries
Other vegetation associations	Mallee Box and Grey Box woodland (previous survey recorded as just Grey Box but Mallee Box appears dominant) – note this is mostly adjacent to the wetland and in the area north of it that is outside of the Park.
Significant species/ communities	Pink Gum (E. *fasciculosa*): SA rare observed; Sticky Daisy Bush and Aldinga Dampiera have also been planted into this MU. Regionally threatened: 3 additional species While Grey Box are present the area is not considered sufficiently distinct to classify as Grey Box woodland.

MU 14	Drooping Sheoak & Pink Gum low open woodland
Management issues	• A good diversity of native species and life forms but the mature tree canopy is sparser than expected (probably due to historical clearance) and no hollows were recorded. • Good levels of regeneration of a number of species were seen, including Pink Gum and Yacca. • A small area has been fenced off and planted for native bees. • Aldinga Dampiera previously occurred in this area but was not observed in this survey; the FoAS have searched for and not found it and so have propagated and planted some seedlings into its former range. • Some weed pressure, mainly along old roadways, particularly Onion Weed and Scabiosa along old route of Redgum Avenue; a large Spotted Gum near the house site but no regeneration was observed.

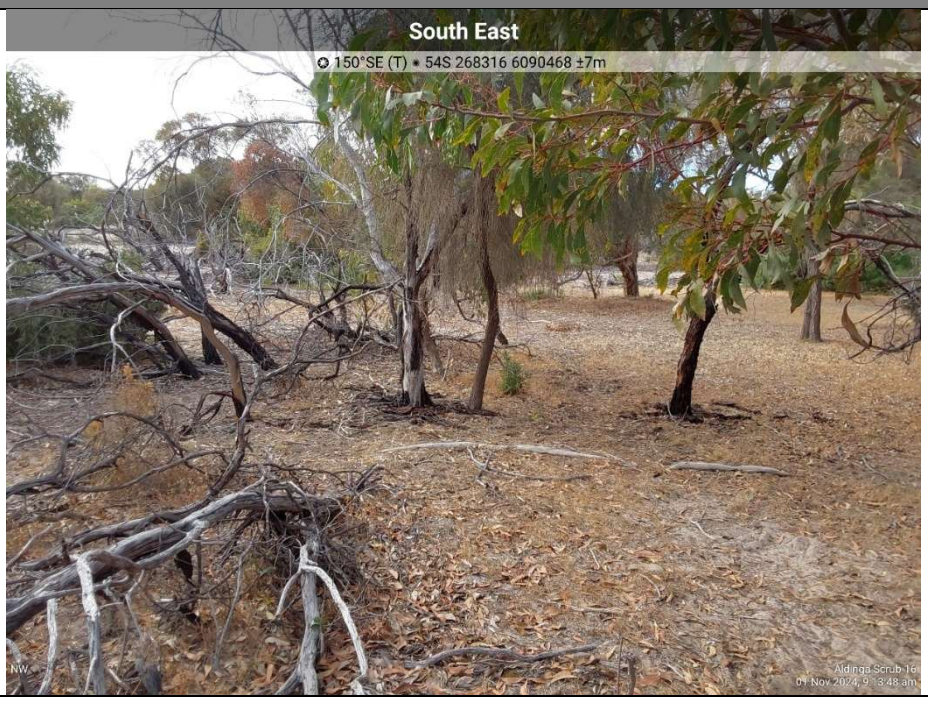
Photopoint for assessment quadrat for 2014 zones 12 and 13 (non-wetland areas), now part of MU 14

2014 Zone 15	*Pink Gum & Drooping Sheoak low open woodland*
Vegetation Condition	Good
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant understorey	*Alyxia buxifolia* – Sea Box *Calytrix tetragona* – Common Fringe-myrtle *Leucopogon parviflorus* – Coast Beard-heath
Significant species/ communities	SA rare: Sticky Daisy-bush (*Olearia passerinoides ssp. glutescens*), Pink Gum (E. fasciculosa) Regionally threatened species: 3 additional rare species
Management issues	• Low levels of Bridal Creeper, Boneseed, Golden Wreath Wattle, African Daisy and Perennial Veldtgrass • Mature tree cover is considered slightly less than expected and the zone lacks tree hollows potentially due to past clearance.

MU 14	Drooping Sheoak & Pink Gum low open woodland
	• The eastern third of the zone was burnt as part of a controlled burn in 2009. • Green Adelaide have been planting and guarding Sticky Daisy-bush to increase the population. • The 2014 plan notes Aldinga Dampiera occurring in this zone, it was not observed in this survey but may occur in areas that were not surveyed.

Photopoint for assessment quadrat for 2014 zone 15; this should be used for future monitoring of MU14

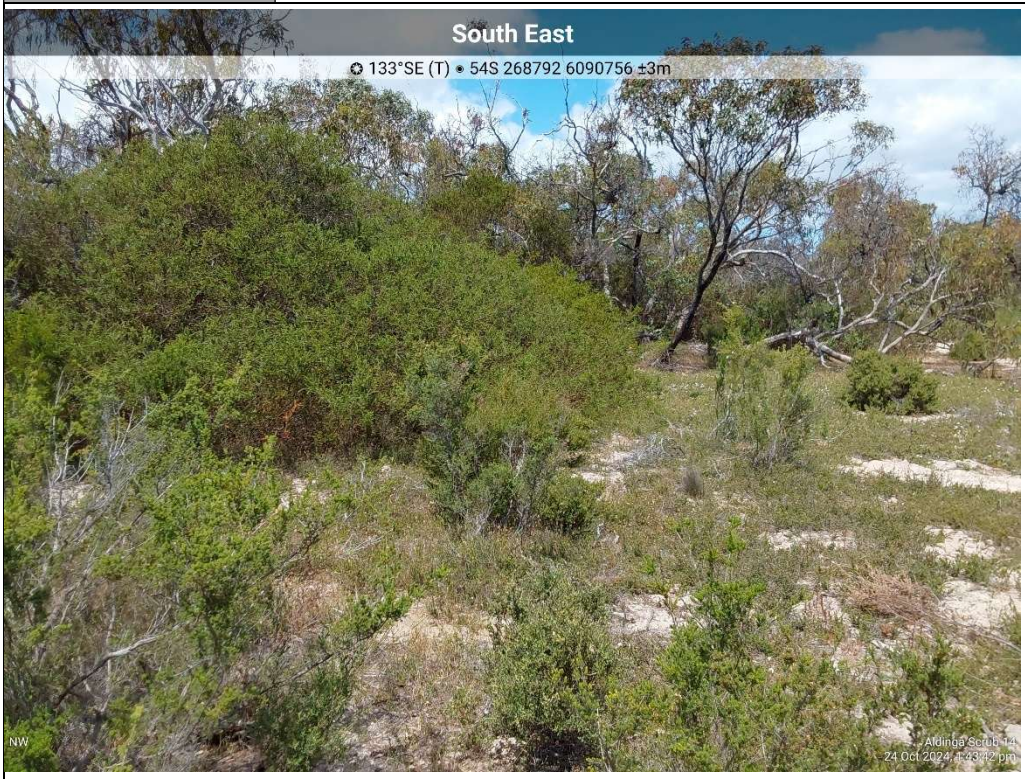
2014 Zone 16	*Drooping Sheoak & Pink Gum low open woodland*	
Vegetation Condition	Good	
Dominant overstorey	*Allocasuarina verticillata*	Drooping Sheoak
	Eucalyptus fasciculosa	Pink Gum
Dominant understorey	*Rhagodia candolleana*	Drooping Sheoak
	Calytrix tetragona	Common Fringe-myrtle
	Leucopogon parviflorus	Coast Beard-heath
Significant species/ communities	SA rare: Sticky Daisy-bush (*Olearia passerinoides ssp. glutescens*), Pink Gum (*E. fasciculosa*) Regionally rare: 3 additional species.	
Management issues	• Includes a fenced off area known as Paxton Patch which was established to provide grazing protection for revegetation of a highly degraded area. • Sticky Daisy Bush present in this zone which was not previously recorded, presumably due to efforts to propagate and plant this species to increase the population. • Woody and other high threat weeds are scattered throughout, with a number of herbaceous weeds along the southern boundary with Wattle Avenue.	

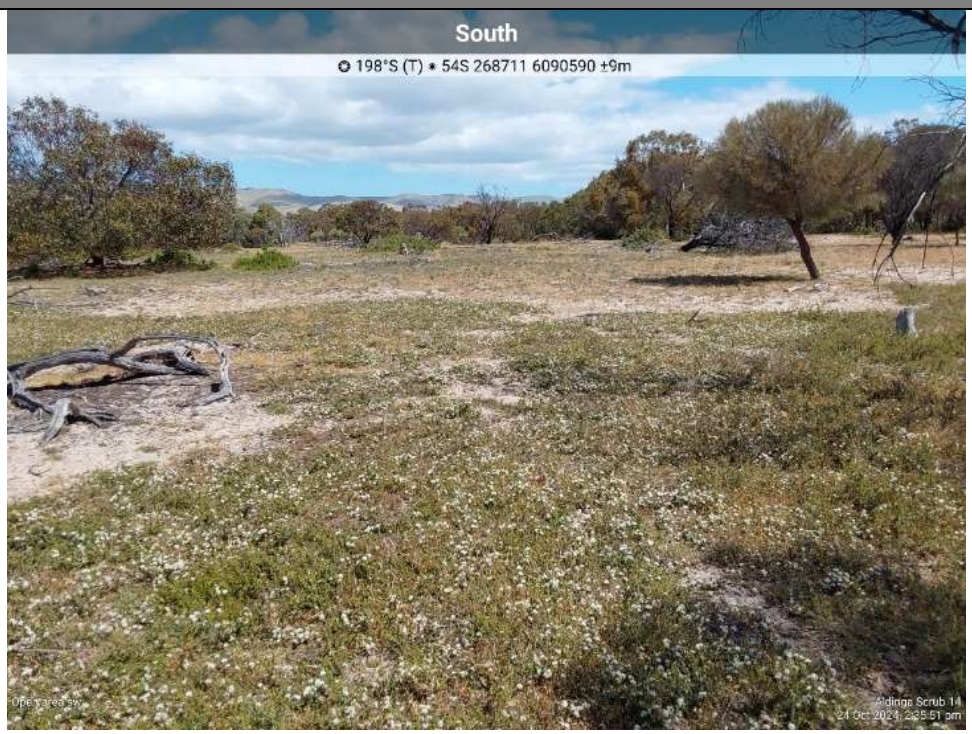
MU 14	Drooping Sheoak & Pink Gum low open woodland	
		Photopoint for assessment quadrat for 2014 zone 16, now part of MU 14

MU 15	Pink Gum and Drooping Sheoak low open woodland
Priority	Medium

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition. 2. Reduce weed threat and increase the cover and diversity of native groundlayer species.
Essential Actions	1. Biennial sweep through zone to control isolated high threat weeds (including Boneseed, Freesia, African Daisy, non-local Tea-tree and Olives) or if resources are limited, work along boundary with adjacent zones (including 16). 2. Follow-up Bridal Creeper control areas.
Supplementary Actions	1. Control other high threat weeds (e.g. Perennial Veldtgrass, Salvation Jane) working away from boundary with adjacent zones. 2. Monitor for regeneration of palatable species and guard if required. 3. Evaluate costs and benefits of establishing grazing exclosures, including temporary options, in open areas and implement if appropriate.

VEGETATION DESCRIPTION AND CONDITION *MU 15 is most of 2014 Zone 14. Refer Appendix A for 2014 Zone locations.*	
2014 Zone 14	***Drooping Sheoak & Pink Gum low open woodland***
Vegetation Condition	Moderate
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant understorey	*Acacia paradoxa* – Kangaroo Thorn *Callytrix tetragona* – Common Fringe-myrtle *Kunzea pomifera* – Muntries
Other vegetation associations	Grey Box grassy woodland in southeastern corner and expanding into adjacent grassy area Mallee Box woodland along eastern boundary and Cox Rd Open exotic grassland areas
Significant species/ communities	SA rare: Pink Gum (E. fasciculosa) Nationally endangered: Grey Box woodland Regional rare: 3 additional species
Management issues	• Historical maps (Wollaston 1989, p. 8) show this zone was previously 6 separate titles, each of which appears to have been subject to different historical clearance activities which are still distinguishable in the aerial imagery and on-ground by the areas of clearance. Some parts (especially the southwest and much of the northeast) have large areas with little tree or shrub vegetation. There are also areas in the northwestern corner where the overstorey is predominantly Golden Wattle. • Large tree stumps, some showing saw marks, still remain, but a number of large old Pink Gums, Mallee Box and Grey Box occur, mainly in the southeastern area. • In Pink Gum woodlands (included in the assessment area), there is a very dense understorey of large Kangaroo Thorn plants, there are few palatable species and most other species (even those commonly not considered palatable) are heavily grazed, indicating heavy grazing pressure.

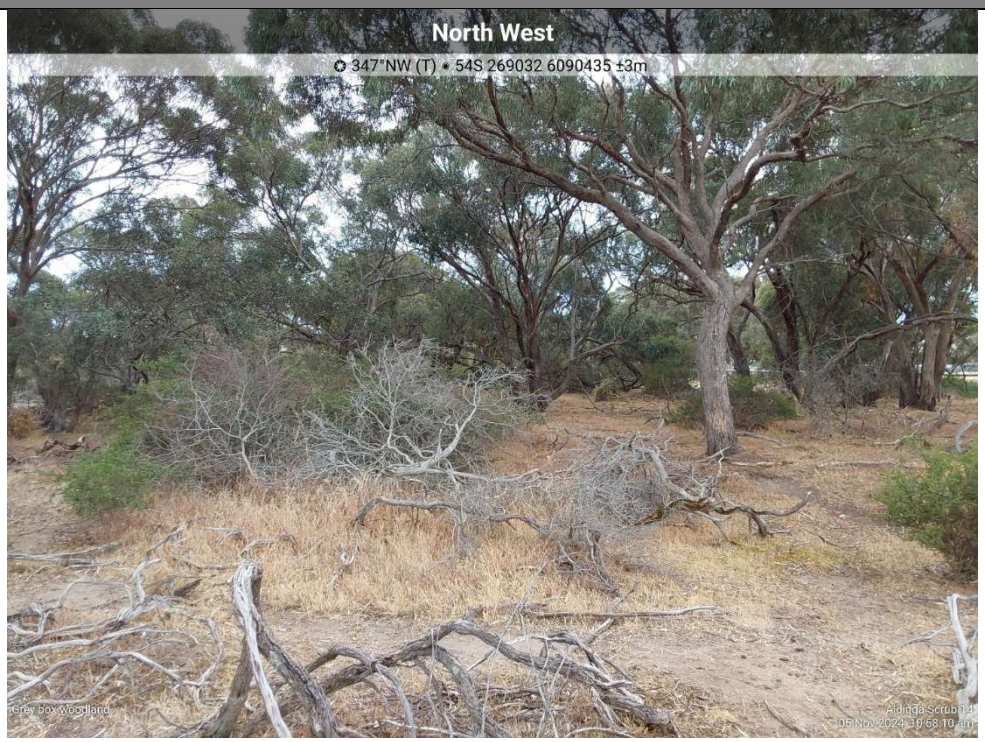
MU 15	Pink Gum and Drooping Sheoak low open woodland
	• Many large dead Olive trees indicate past control has been undertaken but some follow-up of re-growth is required. Bridal Creeper control has been undertaken in this zone in recent years with grant funding. • The extent of past clearance provides an opportunity to establish some large kangaroo exclosures with minimal impact to native vegetation. • Mallee Box grades to Grey Box as the dominant species on lower lying and heavier soils in the south east, potentially representing remnant of the pre-European vegetation of the agriculturally productive soils of this area.
	Representative photograph of the assessment quadrat

MU 15	Pink Gum and Drooping Sheoak low open woodland
	Open canopy area within MU15 with Muntries establishing in the groundlayer.

MU 16	Pink Gum and Drooping Sheoak low open woodland
Priority	High

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Improve current vegetation condition 2. Increase the cover and diversity of native groundlayer species.
Essential Actions	1. Annual control program for Bridal Creeper in conjunction with adjacent zone 14 2. Biennial sweep through zone to control isolated woody weeds, including Olive regeneration. 3. Spot weed around native groundlayer species. 4. Revegetate in patches with native grasses and groundcovers (e.g. local native *Rytidosperma spp., Austrostipa spp., Einadia nutans, Enchylaena tomentosa, Lomandra* spp., *Vittadinia cuneata and V. australisica*) to create a seed source, protect from grazing and spot weed around.
Supplementary Actions	1. Establish BAM site in zone to include with future monitoring. 2. Evaluate costs and benefits of establishing grazing exclosures, including temporary options, in open areas and implement if appropriate.

VEGETATION DESCRIPTION AND CONDITION *MU 16 is part of 2014 Zone 14. Refer Appendix A for 2014 Zone locations.* *The following additional description applies to MU 16 with the Vegetation Description and Condition Assessment for 2014 Zone 14 presented in the Summary of MU 15 (above).*	
Vegetation Condition	Moderate
Dominant overstorey	*Eucalyptus microcarpa* – Grey Box *Melaleuca lanceolata* – Dryland Tea-tree *Eucalyptus porosa* – Mallee Box
Dominant native understorey	*Acacia paradoxa* – Kangaroo Thorn *Rytidosperma sp.* – Wallaby Grass *Rhagodia candolleana* – Seaberry Saltbush
Description & Notes	Not surveyed using BAM method. This zone represents remnant Grey Box grassy woodland which is listed as an endangered ecological community under the EPBC Act 1999; it is therefore considered a high priority for management. Larger trees with numerous hollows occur along the boundary with Cox Rd and the southern park edge, with areas of young trees occurring northwest. Kangaroo Thorn is the dominant understorey, becoming quite dense in some areas. The groundlayer is predominantly exotic herbs and grasses.

MU 16	Pink Gum and Drooping Sheoak low open woodland
	Photograph of MU 16 Grey Box woodland

MU 17	Drooping Sheoak & Pink Gum low open woodland
Priority	Medium

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain current vegetation condition. 2. Reduce weed threat. 3. Increase the cover and diversity of native groundlayer species.
Essential Actions	1. Biennial sweep through zone to control isolated high threat weeds (including Rhamnus, Boneseed, Olives, African Daisy, Acacia longifolia longifolia) or if resources are limited, working from north to south. 2. Control Bridal Creeper working from north to south.
Supplementary Actions	1. Include searching for and guarding regenerating eucalypts and other sensitive species and heavily grazed plants.

VEGETATION DESCRIPTION AND CONDITION
MU 17 is 2014 Zone 17. Refer Appendix A for 2014 Zone locations.

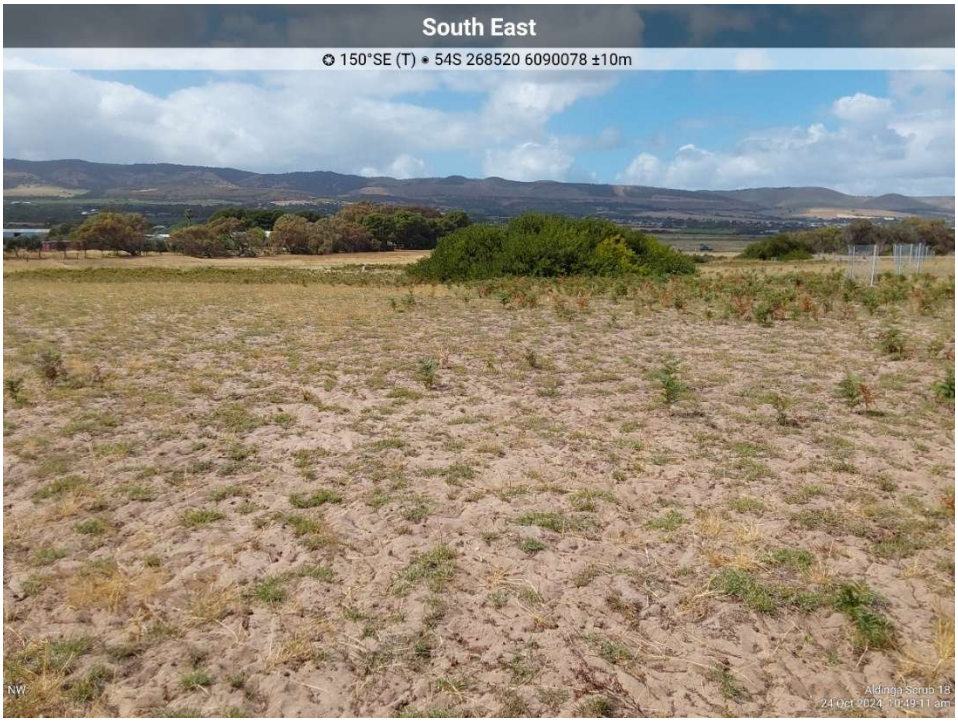
2014 Zone 17	*Drooping Sheoak & Pink Gum low open woodland*
Vegetation Condition	Moderate
Dominant overstorey	*Allocasuarina verticillata* – Drooping Sheoak *Eucalyptus fasciculosa* – Pink Gum
Dominant native understorey	*Rhagodia candolleana* – Drooping Sheoak *Leucopogon parviflorus* – Coast Beard-heath *Pteridium esculentum* – Bracken Fern
Significant species/ communities	SA rare: Tate's Grass-tree (*Xanthorrhoea semiplana ssp. tateana*), Pink Gum (*E. fasciculosa*) Regionally rare: 2 additional species
Management issues	• A number of weedy patches of large Rhamnus, Boneseed and Olive were found at the northern end, Bridal Creeper in low abundance. • High cover of Perennial Veldtgrass. • Very little natural regeneration. • Several rabbit or hare burrows were found. • The health of Pink Gums was moderate, with between 30-70% dieback, and quite high cover of Mistletoe.

MU 17	Drooping Sheoak & Pink Gum low open woodland
	Representative photograph of the assessment quadrat

MU 18	Bracken Fern fernland grading to Spiny Flat-sedge sedgeland
Priority	Low

VEGETATION MANAGEMENT 2025 - 2030	
Objectives	1. Maintain the current vegetation condition 2. Increase cover and diversity of native species.
Essential Actions	1. Biennial control of isolated environmental weeds (e.g. Galenia, Artichoke Thistle and Onionweed) and monitor around planted and remnant trees and shrubs for Bridal Creeper and control as required.
Supplementary Actions	2. Continue to construct kangaroo-proof exclosures and plant hardy, grazing resistant species (e.g. Eucalypts, Sweet Bursaria, Muntries, Seaberry Saltbush, Ruby Saltbush) as a source for surrounding areas and control other high threat weeds in and around these. In the longer term more diverse plantings could be established, however, while the current grazing pressure continues most species will not survive outside of exclosures/guards.

VEGETATION DESCRIPTION AND CONDITION *MU 18 is 2014 Zone 18. Refer Appendix A for 2014 Zone locations.*	
2014 Zone 18	***Bracken Fern fernland grading to Spiny Flat-sedge sedgeland***
Condition	Very poor
Emergent overstorey	*Acacia longifolia ssp. sophorae* — Coastal Wattle Revegetation
Dominant native understorey	*Pteridium esculentum* — Bracken Fern *Cyperus gymnocaulos* — Spiny Flat-sedge
Significant species/ communities	SA rare Pink Gum (*E. fasciculosa*)
Management issues	• This zone has historically been cleared and has almost no remnant trees or shrubs. Bracken Fern is the dominant native species in the higher ground area while sedges and rushes occur in the lower lying areas, however exotic grasses (Perennial Vedtgrass) and herbs (e.g. Capeweed) are the dominant groundlayer. • No natural regeneration / recruitment • There have been plantings of trees, shrubs and groundcovers with large guards that are growing well and will improved the site condition in time. • Old exotic pine trees have been cut down in the northeastern area.

MU 18	Bracken Fern fernland grading to Spiny Flat-sedge sedgeland
	Representative photograph of the assessment quadrat

4. VEGETATION CONDITION AND CHANGE ASSESSMENT

The vegetation condition and change assessment was undertaken, to understand if works undertaken over the past 10 years have been effective in achieving identified Goals within the *Aldinga Scrub Conservation Park, Biodiversity Plan 2014*.

4.1 ASSESSMENT METHODOLOGY

The assessment methodology involved a combination of document and data review, consultation with key stakeholders and field surveys to address the project objectives.

Document and data review

DEW provided a range of background documents including previous plans, grant applications and reports, contractor reports, investigations and monitoring reports. A small number of additional documents were identified during the course of the assessment and added to the review.

A summary of the documents, key issues or activities and relevant parts of the Scrub is provided in Attachment 1. The majority of the documents supplied relate to grants (i.e. grant applications and reports) and contractor engagement (i.e. work orders and contractor invoicing reports).

Biological survey data was downloaded from publicly available sources, namely Atlas of Living Australia. This includes data from a range of sources including citizen scientist platforms which are not always reliable, as well as "denatured" records (i.e. where the exact location has been altered to protect rare and threatened species).

Consultation

Three meetings with the Friends of Aldinga Scrub (FoAS) were held to identify and understand key issues, work areas and activities.

Field surveys

The field surveys used the Native Vegetation Council (2024) Bushland Assessment Methodology (BAM) which is available at:

https://cdn.environment.sa.gov.au/environment/docs/Native-Veg/SEB-Changes-1-Sep-24/Bushland-Assessment-Manual_1-Sept-2024.pdf

The BAM involved undertaking a survey of various indicators of vegetation condition over a 1 hectare quadrat representing a vegetation association of similar condition. The indicators are:

- Native species diversity (spring annuals do not contribute to the species count)
- Native species life forms (cover of each different life form)
- Weed threat
- Proportion of native vs exotic understorey biomass
- Tree hollows
- Fallen timber and leaf litter
- Tree coverage and dieback.

Raw scores are scaled against representative vegetation communities to provide a score for each indicator as well as an overall vegetation condition score. Although the assessment was conducted in a low rainfall year, the method is designed to be undertaken at any time of year, with annual species that may not be present in dry years not included in the score for species diversity (compared with the BCM method used by the FoAS).

For the purposes of this assessment, one quadrat was surveyed for each of the 2014 plan zones, with the location of the quadrat chosen to represent the vegetation association condition of the majority of the zone. So for example, in the 2014 zone 8 which is mostly Pink Gum and Sheoak woodland over shrubs with smaller areas of Mallee Box woodland, the quadrat was located in the Pink Gum and

Sheoak woodland. Similarly, in the 2014 zone 10 the native vegetation becomes sparser towards the east, so the quadrat was located approximately in the middle of the zone.

To enable the surveys to be repeated in future, the GPS location of each quadrat corner was recorded with handheld GPS and supplied in Attachment 2 and a photograph taken from each corner looking towards the opposite corner. The location of the quadrats is shown in Map X. In almost all cases the quadrats were 100 m x 100 m. The wetland quadrat needed to be shaped to fit a single vegetation association and is therefore not square.

All data are entered into the NVC supplied Excel Spreadsheets and these have been provided to Green Adelaide (Attachment 3).

It should be noted that the BAM is not the same as the Bushland Condition Monitoring (BCM) method (Croft et al 2005) which is the method used by the FoAS to monitor 3 sites, and by DEW to monitor 1 site. Both methods record a similar set of indicators, however a key difference is that BMC sites are smaller (900 m^2) but include collecting more detailed data for some indicators, in particular tree health and habitat. However the smaller size of the BCM sites means they are less suited to assessing the condition of large sites and informing management.

Comparison of assessment results with previous plan

The previous 2014 plan did not use a structured vegetation assessment to assess condition but assigned a vegetation condition classification for each area as presented in Table 4. Descriptions are presented for each area with dominant and significant plant species listed, but no photographs or detailed data. The comparison of vegetation condition between 2014 and 2024 is therefore largely based on the assumption that the 2014 condition categories are comparable with the condition ratings used in this assessment which are based on the BAM Vegetation Condition Score (and consistent with that used in vegetation planning in nearby areas e.g. Miles and Koch 2025). An earlier plan for the Scrub (Kraehenbuehl & Holton 2001) used classification on a scale of 0 (poorest) to 3 (best) (Table 4). The 2001 condition ratings have been interpreted as per Table 4 and are presented for Management Units in section 4 to provide an indication of the long-term changes in each unit.

The 2014 vegetation condition rating for each zone is presented in Figure 2.

Table 4 Vegetation condition classification for 2001, 2014 and 2024

2001 condition categories	Interpreted 2001 condition rating	2014 condition categories	2014 condition definitions	2024 condition rating categories	BAM Vegetation Condition Score
3	Excellent	Excellent	Largely undisturbed native plant communities	Excellent	66-80
2	Good	Good	Substantial native plant cover with minor weed infestations	Good	51-65
1	Moderate	Modified	Moderate native plant cover with manageable weed infestations, or dominated by low priority weeds	Moderate	36-50
0	Poor/ very poor	Highly modified	Basic native habitat structure and function remains, but with low native plant cover and diversity, and significant weed cover	Poor	21-35
		Derelict	Little or no native habitat structure remains, dominated by weed or pasture species	Very Poor	0-20

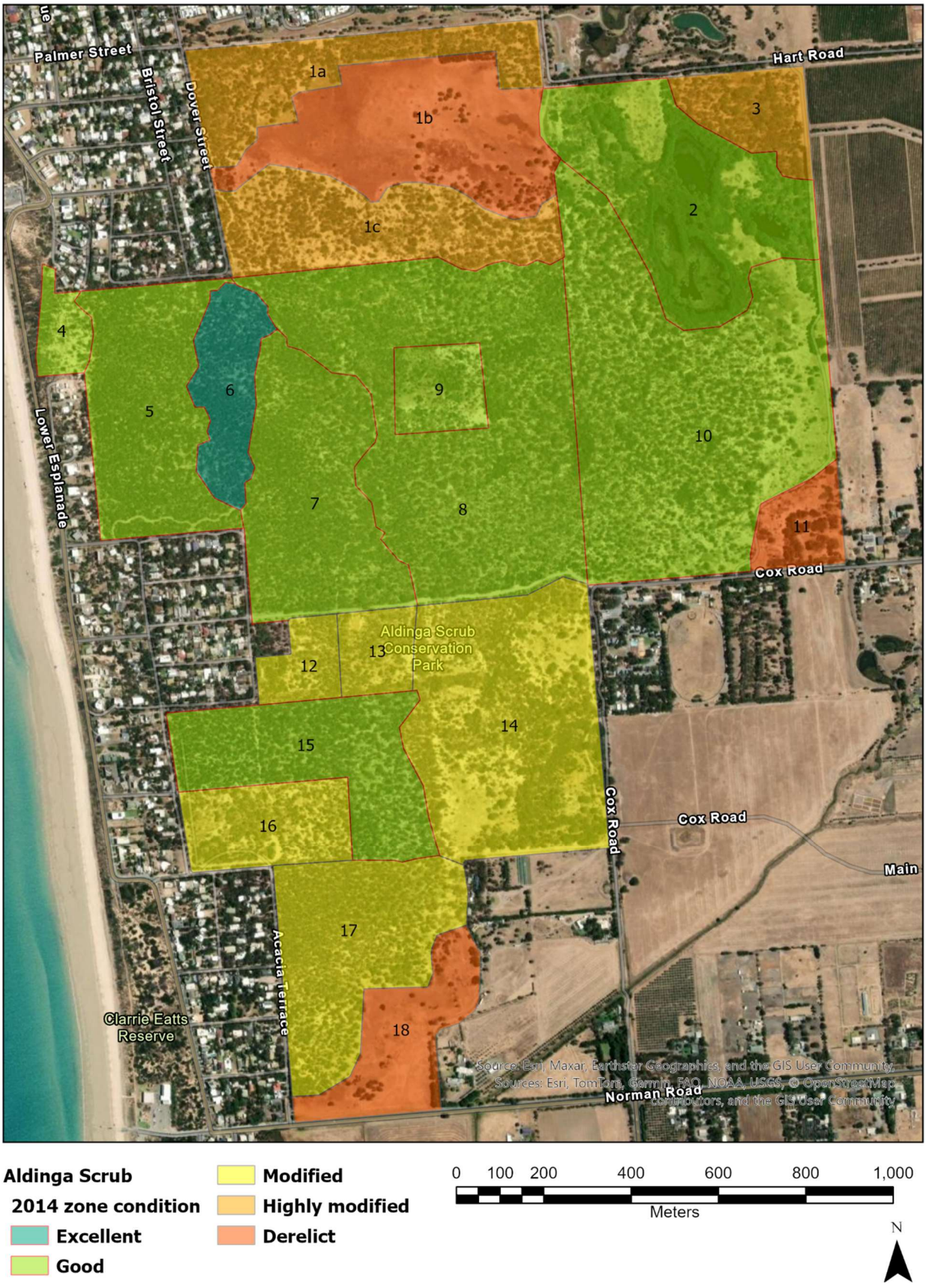


Figure 2 Condition of zones in 2014 (adapted from Table 4.2, p. 16 in the 2014 plan)

4.2 ASSESSMENT FINDINGS

Vegetation Condition Change

The current (2024) vegetation condition of the 2014 zones is presented in Figure 3, showing the location of the BAM sites used for the surveys. Descriptions of the zones based on the new Management Units are provided in section 3.1. A more detailed breakdown of the key BAM vegetation condition indicator scores is provide in Appendix 2, lists of native and exotic flora observed in Appendix 3 and the site scores for each zone in Appendix 5.

The change in vegetation condition for each zone from 2014 to 2024 is presented in Figure 4 and summarise in Table 5. Note the following terminology is applied to recognise the difference in relation to the plan objectives:

- "No change" is used to describe a zone that was classed as "derelict" or "highly modified" in 2014 and was classed as the equivalent condition (poor or very poor) in 2024,
- "Maintained" is used to describe a zone that was in modified, good or excellent condition in 2014 and equivalent condition in 2024.

Overall, the assessment has shown that in 2024, 9 out of the 19[2] zones have improved in condition compared to 2014, the single zone classed as excellent on 2014 had been maintained and 4 zones in moderate to good condition had also been maintained. The only zones where a decline in condition were reported were zones 2 and 10. The decline in condition in zone 10 is supported by the BCM monitoring of the FoAS, however the change presented for zone 2 (the wetland) is considered to be more likely due to differences in the assessment methods, with the BAM reference plant communities not well suited to this type of wetland.

Table 5 Summary of zone condition since 2001 and change in condition from 2014 to 2024

Zone	2001	2014	2024	Trend since 2014	Comments
1a	Poor/ very poor	Highly modified	Poor	Improved	The zone was a low priority and therefore limited effort has gone into improving the condition.
1b	Poor	Derelict	Very poor	No change	The zone was a low priority and therefore limited effort has gone into improving the condition.
1c	Poor	Highly modified	Moderate	Improved	The zone was previously described as having a sparse native understorey but now has a good coverage and diversity of native understorey although there are still a significant amount of bare ground.
2	Poor	Good	Moderate	Decline	There have been major changes in vegetation composition resulting directly from the changes in hydrology but likely also indirectly by increasing kangaroo grazing pressure. The BAM survey has probably under-estimated the vegetation condition by focussing on only one vegetation association and the methodology not fitting well for wetland vegetation. The vegetation surrounding the wetlands has improved. This is demonstrated by a comparison of the photos below with Plate 3 of Wollaston (1989).

Figure 1. [2] The 2014 plan treated zones 8 and 9 as one zone

Zone	2001	2014	2024	Trend since 2014	Comments
3	Moderate	Highly modified	Poor	Improved	A moderate diversity of native species has developed but the cover of native understorey is still low, Stemodia florulenta was not recorded in the previous plan (2014). Although still classified as 'poor', based on previous description the zone is considered to have improved since 2014.
4	Good	Good	Excellent	Improved	This zone has had a high level of investment by Green Adelaide (and it's predecessors) in control of numerous high threat weeds that were previously abundant and are now found only in isolated occurrences, with several species no longer present, such as Aleppo Pine and Marram Grass. A BCM site ALD-DENR-A-5 was established in the lower coastal heath vegetation. McCallum (2011, 2015) recorded 56 native species there and the site was classified as excellent for native species diversity, and good for structural diversity, regeneration and grazing but moderate for tree health, between 2011 and 2015 the weed threat rating was reduced slightly. The photos show improved vegetation cover in the dunes when compared with Figures 9 to 11 of Wollaston (1989)
5	Good	Good	Excellent	Improved	This zone was identified as part of the core habitat areas and a priority for management in the previous management plan and has been the focus of grant-funded weed control for Bridal Creeper and woody weeds over a number of years.
6	Excellent	Excellent	Excellent	Maintained	Identified as a high priority and core management area in previous plans; this site has been the focus of contractor weed control; many weeds previously documented were not observed
7	Excellent	Good	Excellent	Improved	This zone was identified as part of the core habitat areas and a priority for management in the previous management plan and has been the focus of grant-funded weed control for Bridal Creeper and woody weeds over a number of years.
8 & 9	8: Good 9: Poor	Good	Good	Maintained	Given the improvements in condition achieved in the previous core habitat zones in the previous years, this zone is now considered a high priority for management to increase the condition

Zone	2001	2014	2024	Trend since 2014	Comments
					to Excellent and incorporate as a "core habitat" area. However the area identified as zone 9 in 2001 appears to be quite distinct in 2024 and therefore restored to being a separate Management Unit.
10	Moderate	Good	Moderate	Decline	A BCM site in the northwestern corner supports this finding, showing a decline in structural diversity, although excellent species diversity had been maintained (NCSSA 2021) (the BAM site is located further south and east and recorded moderate-high diversity)
11	Poor	Derelict	Very poor	No change	This is the site of a former camp area; although the vegetation condition is still considered very poor, core foundational activities to allow for improvement have been undertaken including removal of the buildings and some of the large woody weeds and exotic trees and revegetation along the southern boundary.
12	Poor	Modified	Good	Improved	Note the wetland area was assessed separately in 2024 and woodland areas in 12 assessed with 13.
13	Poor-medium	Modified	Good	Improved	Away from the wetland and box woodlands, Zones 12 and 13 are very similar and both zones were therefore assessed together. The condition has steadily improved since 2001.
14	Poor	Modified	Moderate	No change	Whilst the vegetation condition assessment shows no change, the open grassy areas appear to be covering over with native vegetation (including eucalypt regeneration) and may in fact indicate an l improvement in some areas.
15	Moderate	Good	Good	Maintained	Very similar to zones 12, 13 and 16 – this zone has been maintained in good condition while the other zones have been improved
16	Poor	Modified	Good	Improved	This zone has seen a steady improvement and although the canopy cover is slightly lower than adjacent zones, the overall condition of zone 16 is now similar to adjacent zone 15.
17	Moderate	Modified	Moderate	Maintained	Some weed control work has been undertaken but the zone still has patches of woody weeds and also has low native groundlayer.
18	Poor	Derelict	Very poor	No change	The zone is a low priority and therefore limited effort has gone into improving the condition.

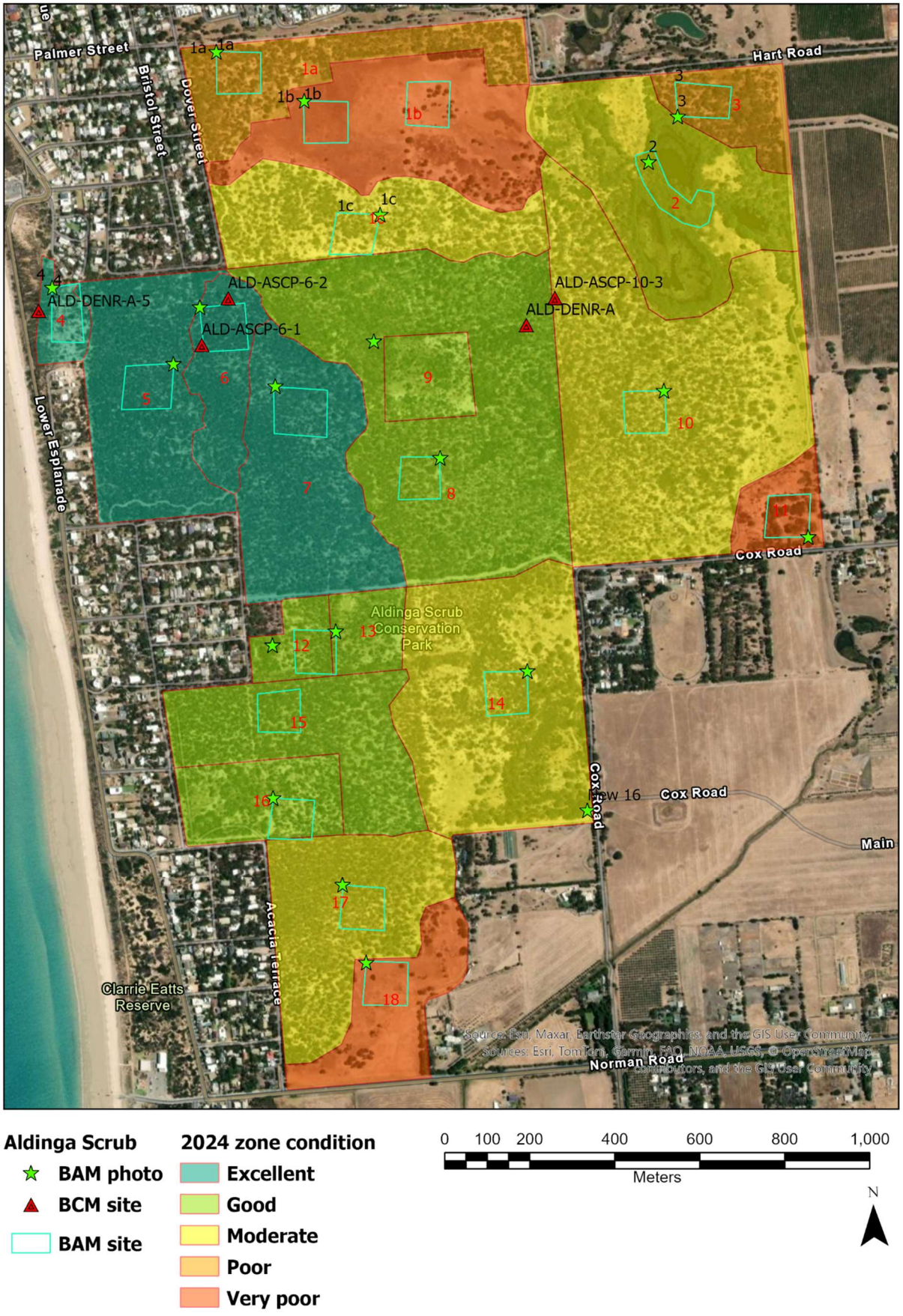


Figure 3 2024 vegetation condition rating for previously identified management zones

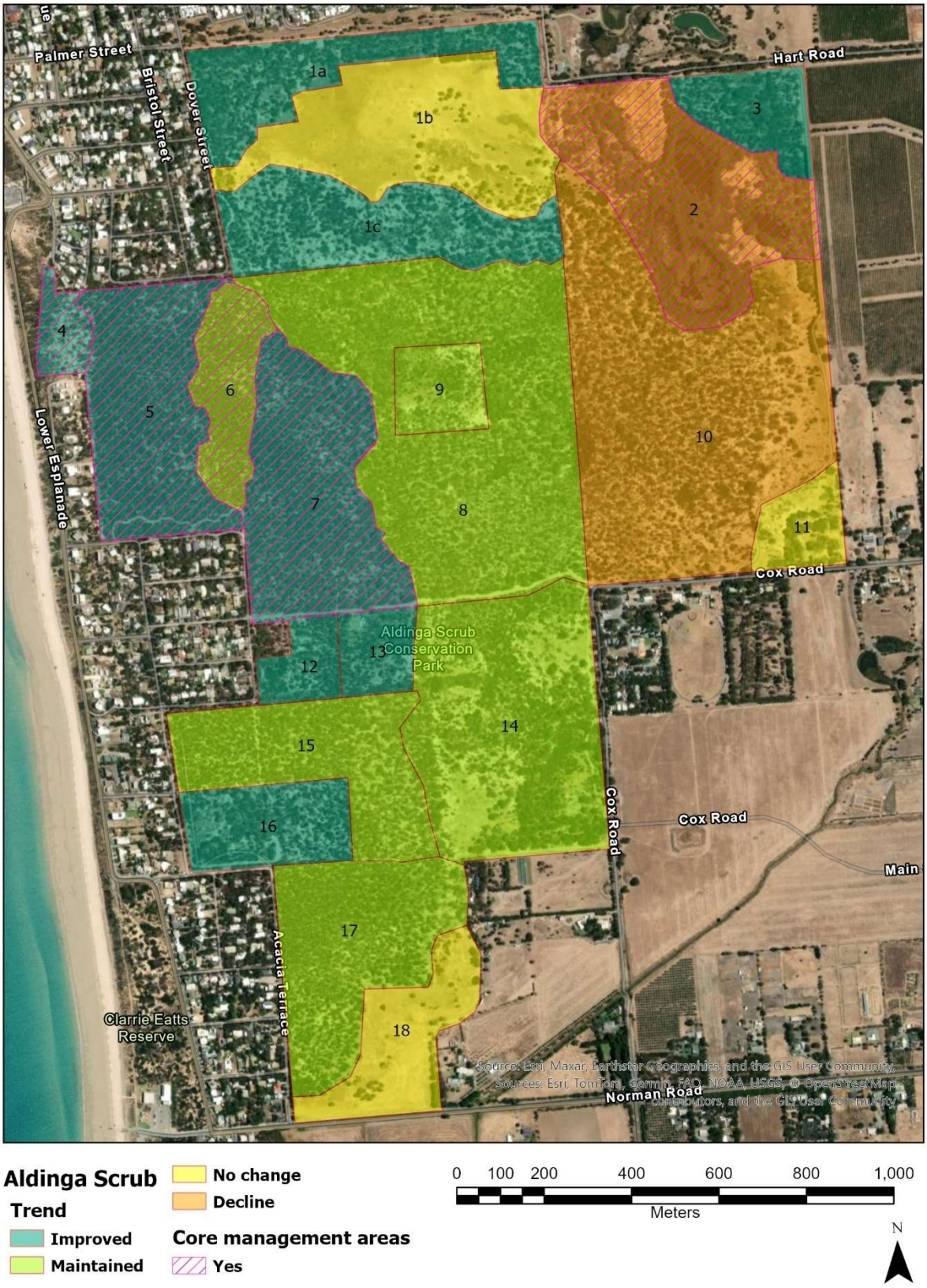


Figure 4 Showing change in vegetation condition from 2014 to 2024 for zones

Evaluation of progress towards Goals and Objectives

The available baseline data and methodology used in this assessment enables progress to be measured for two of the three goals set in the 2014 plan, while one goal requires a targeted assessment. Overall, the goals appear to have been partially met (Table 6) and most objectives achieved (Table 7). Threats and key drivers of change are discussed in section 4.3; the impacts of grazing are considered to be a likely cause for improvements not being achieved more widely despite progress on the management objectives.

Table 6 Evaluation of progress towards 2014 Goals.

Goal	Evidence / Observations	Assessment
1. Protect and foster significant native species	Neither this nor the previous assessment included species population surveys, however the assessment does show that a number of significant native plant species occurring outside of the fenced off areas that occurred in 2014 continue to be present and have increased in their coverage, with observations in zones that they were not previously recorded (e.g. Sticky Daisy Bush, Blue Rod). Several regionally significant species appear to be abundant in the Park (Sea Box and Muntries) Exclosures have been constructed for a number of threatened flora, including nationally critically endangered Copper beard-orchid (*Calochilus cupreus*), endemic to Aldinga Scrub, and SA endangered and endemic Goldsack's Leek Orchid (*Prasophyllum tortilis*). Efforts to conserve some species are being hampered by heavy grazing pressure (e.g. Creeping Boobialla *Myoporum parvifolium* has been widely planted but few were observed and FoAS report they are grazed). Regionally rare Quandong (*Santalum acuminatum*) occurs in nearly every zone, but no regeneration was observed, and the FoAS have reported the trees never set fruit (a phenomena that is occurring across metropolitan populations).	On track for some species, but requires more detailed assessment including of population demographics to determine sustainability.
2. Maintain and improve the condition of core vegetation management area	Western Core habitat: zones 2, 5 and 7 were previously classified as 'good', now 'excellent' and zone 6 was previously excellent remains excellent. The eastern core habitat (the wetland) assessment indicates a decline in condition, however this is likely an artefact of two different assessment methods, and potentially the wetland vegetation now being in a more stable state than in 2014 when flows were being re-introduced into the wetland and species composition reflected a wider range of water regimes.	Achieved for western core habitat area. Eastern (wetland) core habitat has probably improved.
3. Improve the condition of vegetation in the remainder of the park	Outside of the core habitat areas: • 5 zones improved in condition, • 2 zones remained in good condition, • 6 zones remained in either moderate or poor condition ('no change'), and • 1 declined in condition. Overall, the weed threat is considered to have been reduced, however the benefits of this are being offset by an increase in grazing pressure which is reducing the cover and diversity of native groundlayer species and reducing regeneration of some tree and shrub species.	Achieved in some zones but not across the Scrub

Table 7 Assessment of progress on 2014 Objectives

Objective		Progress and activities	Assessment
1. Protect and foster plant species of conservation significance by:	a. Reducing the impact of weeds, preferably using minimal-disturbance methods;	Weed control has been implemented across the scrub using minimal disturbance methods and the weed threat has been reduced.	On-track
	b. Initiating new sub-populations by translocating individual plants into suitable habitat;	FoAS have propagated and planted out some species of conservation significance.	On-track
2. Protect and foster native fauna species through:	a. Improving knowledge of their abundance, distribution and habitat requirements in the park;	Not within scope	Not assessed
	b. Ensuring management activities do not have negative effects on species persistence;	Not within scope.	Not assessed
3. Protect and foster native vegetation communities by:	a. Removing key weed species from the park using minimal-disturbance methods;	Cover of most high threat weeds reduced and minimal disturbance methods used (see section 4.3)	On track
	b. Monitoring for new weed incursions and other biodiversity threats, and managing threats as soon as practical;	No new weed incursions or biodiversity threats appear to be an issue.	On track
	c. Managing total grazing pressure to maximise natural regeneration rates;	Some rabbit control is undertaken and grazing exclosures built to preserve sensitive species but total grazing pressure is high and has probably increased from 2014 (see below)	Not met
	d. Undertaking post-fire weed control to maximize native plant community recovery;	No controlled burns have been undertaken since 2014 and no largescale uncontrolled fires have occurred therefore this has not needed to be implemented	Not applicable
	e. Liaising with neighbours where issues on adjoining properties (e.g. weed spread) may affect the park;	Not within scope	Not assessed
	f. Negotiating appropriate storm-water management with relevant land managers;	Not within scope	Not assessed
	g. Supplementing natural regeneration with local-provenance tubestock where appropriate;	FoAS have targeted species with poor regeneration such as Silver Banksia and Pink Gum	On track
	h. Undertaking large-scale habitat restoration of degraded areas.	Some revegetation work and control of exotic trees has occurred in degraded areas however resource	Not met

Objective		Progress and activities	Assessment
		limitations (e.g. funding and volunteer time to implement and maintain sites) and grazing pressure by kangaroos has limited the amount of habitat restoration works.	

Summary of Work and Progress since the 2014 Plan

Coast and Seas Investment (Green Adelaide)

Green Adelaide (and it's predecessors) made an on-going investment in the coastal vegetation in MU4 through the Coast and Seas program over the last 15 years. This funding has largely been directed towards a program of weed control that has been highly successful in eradicating several high threat weeds and reducing others to scattered individual seedlings.

Friends of Aldinga Scrub

The FoAS hold weekly working bees where they undertake weeding, seed collection and propagation, revegetation and targeted species conservation in the Park, totalling almost 11,000 volunteer hours since 2014 (Table 8).

Table 8 FoAS working bee hours since the 2014 plan (provided by J. Edmeades, FoAS)

Year	Hours	Year	Hours
2014	670	2020	1,214
2015	897	2021	1,251
2016	674	2022	1,298
2017	877*	2023	1,025
2018	877*	2024	1,192
2019	1,017	Total	10,992

*There are 2 years missing due to lost data sheets, the hours are an estimate from partial hours recorded for those years.

In addition to the 'on-ground activities', the FoAS also undertake a range of other activities such as bird monitoring, Bushland Condition Monitoring and educational activities. The FoAS have been undertaking quarterly Birdata surveys since 2021. To date they have observed 100 species[3]. A previous assessment of bird surveys recorded 172 species over a 32 year period to from 1964 to 1996, (Ashton 1996) however that included records from The Washpool south of Norman Road, while the FoAS only include the Aldinga Scrub north of Norman Rd (i.e. the area covered by this report). The FoAS are currently comparing their more recent survey results with past records, papers and species lists.

In recent years the FoAS have been using large "paddock tree" guards for their revegetation activities to protect plantings from grazing by kangaroos (e.g. Figure 5 Example of "paddock tree" style plantings by the FoAS to establish palatable species in a degraded area (MU18)Figure 5). In each guard a groundcover, shrub and a canopy species are planted using seedlings propagated by the Friends from seed collected within the Park. The revegetation sites are mainly focussed in very degraded areas and close to better areas to extend the cover of native vegetation out from the better areas.

[3] Monitoring reports, including the latest Summer 24/25 report, are available at: https://www.flickr.com/photos/foas/albums/72157719446783624/with/54368664940/

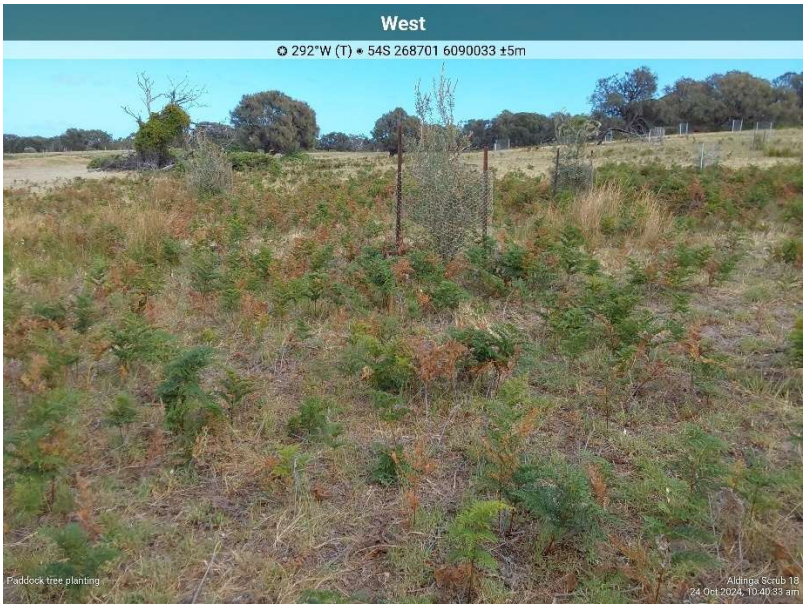


Figure 5 Example of "paddock tree" style plantings by the FoAS to establish palatable species in a degraded area (MU18)

Grants

The FoAS committee have also applied for and managed grants almost annually that are mostly to engage contractors to undertake weed control that is beyond the capacity or resources of the volunteers. This enables contractors to push back weed fronts that can then be followed up and maintained by the FoAS volunteers. As presented in below and in section 4.3, this approach has been successful in improving the vegetation condition of a number of zones across the Scrub.

The control of weeds through this approach has led to improvements in vegetation condition across much of the Scrub, as presented above (section 4.1). The fact that potential future improvements are reliant on short term (usually annual) grant funding and the in-kind resourcing of the FoAS, either or both of which are not guaranteed to continue, means there is a risk that the goals and objectives set out in Section 3 may not be achieved.

Threatened species protection

Targeted threatened species protection has been undertaken by DEW (GA and NPWSA) and the Threatened Plant Action Group (TPAG), as well as the FoAS. Works have included fencing off populations of certain species, as well as propagating and planting species in suitable areas (including Aldinga Dampiera, Creeping Boobialla and Sticky Daisy-bush). Assessment of the changes in populations of threatened species was not a focus of this assessment and the fenced-off areas were not surveyed.

4.3 THREATS AND KEY DRIVERS OF CHANGE

Invasive Weeds

Over the last ten years, through the volunteer efforts of the FoAS and contractors engaged via grants, there has a been a concerted effort to control and eradicate high threat weeds in priority areas by undertaking primary control along weed fronts that are pushed back annually with follow-up weeding to control any regrowth and regeneration from the seed bank. Many of the weeds reported in the 2014 plan were recorded in less zones in 2024, most notably African Boxthorn (*Lycium ferocissimum*) was recorded in 9 zones in 2014 and only 1 in 2024. Other woody weeds Italian Buckthorn (*Rhamnus alaternus*), Olive (*Olea europaea*), and Boneseed (*Chrysanthemoides monilifera*) were also commonly recorded in 2014 but found mostly as scattered individuals and usually small seedlings in 2024. MU4 is an excellent example of the success of this approach

Table 9 provides a list of high threat weeds that have been recorded on the site. Weeds are classified as high threat if they meet one or more of the following criteria:

- Declared under the *Landscapes South Australia Act 2019*; and/or
- Red Alert weed rating of 3 or more; and/or
- non-indigenous woody and herbaceous species noted to be proliferating in the site.

A full list of introduced plant species by zone is provided in Appendix 3.2.

Table 9 High threat weeds recorded in Aldinga Scrub

Scientific name	Common name	SMLR threat	Declared	Number of zones*
Acacia longifolia ssp. longifolia	Sallow Wattle	3		2
Asparagus asparagoides f.	Bridal Creeper	5	Yes	12
Cenchrus clandestinus	Kikuyu	3		2
Chrysanthemoides monilifera ssp. monilifera	Boneseed	4	Yes	10
Cynara cardunculus ssp. flavescens	Artichoke Thistle	2	Yes	2
Echium plantagineum	Salvation Jane	2	Yes	9
Ehrharta calycina	Perennial Veldt Grass	4		14
Ehrharta villosa var. maxima	Pyp Grass	3		1
Euphorbia terracina	False Caper	3	Yes	1
Freesia cultivar	Freesia	3		2
Gazania linearis	Gazania	3	Yes	1
Leptospermum laevigatum	Coast Tea-tree	3	Yes	3
Lycium ferocissimum	African Boxthorn	3	Yes	1
Moraea sp.	Cape Tulip	3	Yes	1
Olea europaea ssp. europaea	Olive	4	Yes	5
Oxalis pes-caprae	Soursob	4		5
Pinus sp.	Pine	3		1
Rhamnus alaternus	Blowfly Bush	3	Yes	6
Rosa sp.	Wild Rose/Briar	3	Yes	2
Scabiosa atropurpurea	Pincushion	3		1
Senecio pterophorus	African Daisy	3		9

*out of 16 with 1a, 1b and 1c as one zone, 8 and 9 as one, and 12 and 13 as one

Pest Animals

Diggings and buck heaps of Rabbits (*Oryctolagus cuniculus)* were observed during the survey, and several burrows found. Far less rabbits and rabbit droppings were observed than sign of kangaroos (discussed below) and it is considered unlikely that Rabbits are impacting the native vegetation to the same extent as kangaroos.

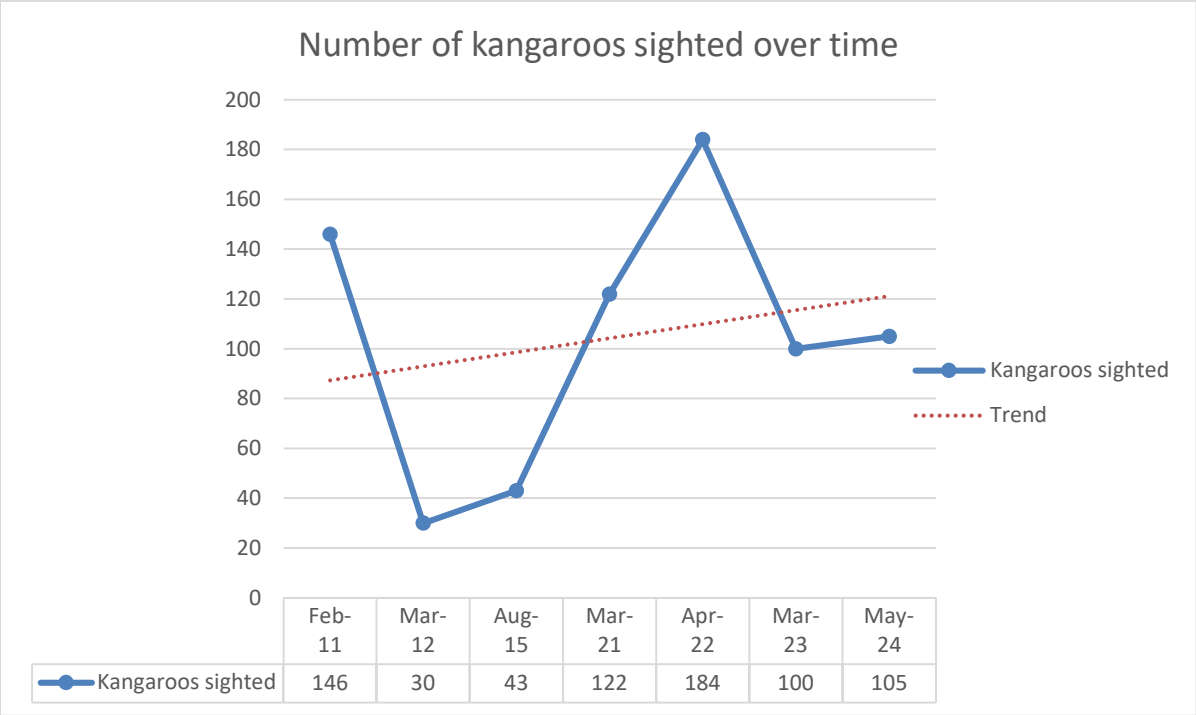
Foxes (*Vulpes vulpes*) were also seen and Cats (*Felis catus*) are likely although not observed, and FoAS report some walkers letting their dogs off lead whilst in the scrub. Control of feral predators is a priority within the Scrub for protection of nearby Hooded Plovers nesting sites.

Grazing pressure

Concerns have been raised by the Friends group over a potential over-abundance of Western Grey Kangaroos (*Macropus fuliginosus*) within the park's boundaries. Anecdotal reports suggest a visible negative impact on native plant regeneration potential and damage to a range of native vegetation. The following provides a summary of the results of monitoring by TAFE students and observations collected during this assessment.

TAFE Surveys

Population survey data collected by TAFE SA students (Diploma in Conservation & Ecosystem Management) by undertaking line transects supports the incidental impressions and anecdotal reports of an unsustainable population. Since 2011, seven surveys have been undertaken as educational exercises. Overall, an increasing trend in kangaroo numbers has been recorded, although the numbers have fluctuated (see Figure 6).



	Feb-11	Mar-12	Aug-15	Mar-21	Apr-22	Mar-23	May-24
Kangaroos sighted	146	30	43	122	184	100	105

Figure 6 Plot of historical raw data, depicting the number of sightings and trend line (Supplied: Oliver Koch).

Across 40 hectares, Zone 1B (MU2) holds a calculated population density of 1.2 kangaroos per ha. This result exceeds the sustainable maximums of 1 kangaroo/ha in native grassland, 0.5/ha in woodlands and 0.9/ha in open woodlands (Farnsworth, 2023). Notably, the survey area does not resemble any of these habitats, as this association is already heavily degraded.

To assess terrestrial vegetation abundance and bare ground cover, a belt transect was carried out by TAFE across Zone 1B in early 2024. The TAFE data shows there was a very high proportion (66% cover) of bare ground in early 2024, with weeds and kangaroo scats accounting for most of the ground cover and only a very small percentage of native groundcover (Figure 7). This level of ground cover is less than the recommended minimum 50% vegetative surface cover to protect sandy soils from wind and water erosion (Cole 2017). Almost half of the vegetative groundcover was made up of the annual weed Salvation Jane (*Echium plantagineum*) (Figure 8), which when it dies off would result in more bare ground.

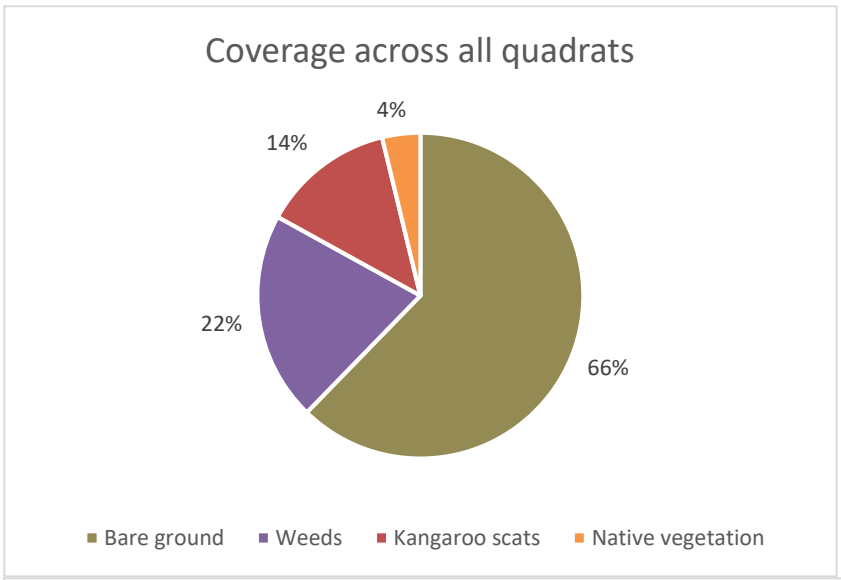


Figure 7 Calculated coverage percentages in zone 1b (Oliver Koch)

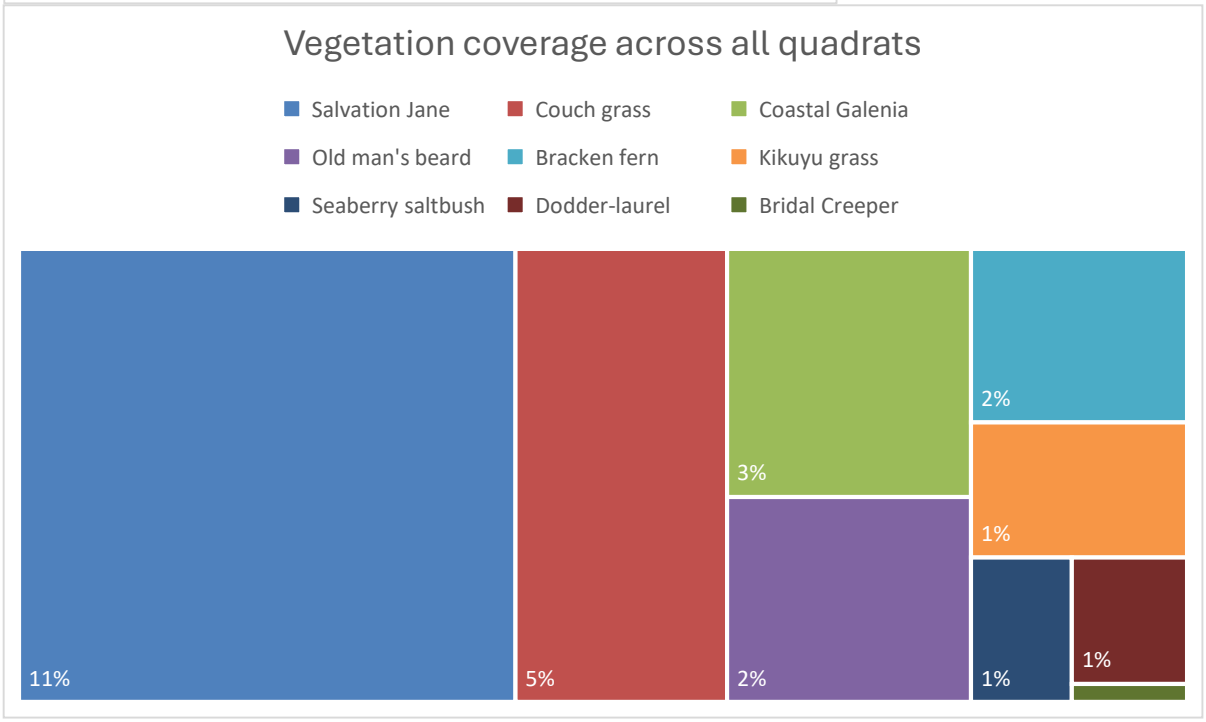


Figure 8 Vegetation coverage across all quadrats in percent (Oliver Koch).

Figure 9 Some of the survey quadrats featured little to no vegetation at all (Photo: David Brown)

This Assessment

The BAM method used in the surveys does not include a direct measure of grazing impact or bare ground, however throughout the 2024 vegetation condition assessment, supplementary observations of what plant species had been grazed and numbers native tree and shrub seedlings were recorded for each quadrat.

Grazing Damage

Species of native plants that appeared to have been moderately to severely grazed were recorded for each BAM quadrat. The total number of grazed species is not necessarily indicative of grazing pressure by zone as some zones have low native species diversity compared with others, and preferred grazing species may have been grazed out in some zones. Similarly the BCM method used by the FoAS is reliant of palatable species being present to detect grazing impact and their monitoring undertaken by the FoAS has recorded a range of scores for grazing pressure with no clear trend.

28 native plant species displayed moderate to excessive grazing damage (Table 10). This number includes species that are not typically grazed such as Ruddy Beard-heath (*Styphelia rufa*), Flame Heath (*Stenanthera conostephioides*) indicating that Kangaroos were possibly needing to eat less palatable species to sustain their health. It was however surprising that Drooping Sheoak (*Allocasuarina verticillata)* which is generally targeted by kangaroos was rarely grazed despite occurring widely. Many shrub species were heavily grazed to resemble a low topiary shrub (Figure 10 Example of very severely grazed *Calytrix tetragona* Figure 10), while tree species showed browse lines where the lower leaves have all been removed (e.g. cover photo bottom right).

Almost no native grasses have been observed outside of the fenced exclusion zones, and several groundlayer species such as Pigface *(Carpobrotus rossii*) and Chocolate Lilies *(Arthropodium* spp.) are common in the fenced areas and almost absent outside but could be seen with grazed tips where they grew through the fences.

The cover and diversity of exotic grasses is also quite low, and Perennial Veldt grass outside the exclosures was heavily grazed.

Table 10 Native species in each BAM quadrat with moderate to severe grazing damage

		Zone																
Scientific name	**Common name**	1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	Total
Allocasuarina verticillata	Drooping Sheoak					x									x	x		3
Acacia pycnantha	Golden Wattle														x			1

		Zone															
Scientific name	**Common name**	1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	Total
Banksia marginata	Silver Banksia						x	x		x						x		4
Calytrix tetragona	Common Fringe-myrtle												x			x		2
Cryptandra tomentosa	Heath Cryptandra													x				1
Cyperus sp.	Flat-sedge		x															1
Dianella sp.	Flax-lily				x	x	x	x							x			5
Duma florulenta	Lignum		x															1
Eutaxia microphylla	Common Eutaxia													x				1
Ficinia nodosa	Knobby Club-rush		x		x	x		x	x			x		x	x			8
Hibbertia sp.	Guinea Flower					x							x		x			4
Juncus pallidus	Pale Rush			x														1
Lepidosperma sp.	Sword-sedge					x			x				x	x	x			5
Leptospermum sp.	Tea-tree									x			x					2
Lomandra sp.	Mat-rush					x	x	x	x							x		5
Lucopogon parviflorus	Coast Beard-heath												x			x		2
Machaerina juncea	Bare Twig-rush											x						1
Melaleuca lanceolata	Dryland Tea-tree														x			1
Muehlenbeckia gunnii	Coastal Lignum	x													x			2
Myoporum insulare	Common Boobialla													x	x			2
Pyrorchis nigricans	Fire Orchid					x												1
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush					x												1
Rytidosperma sp.	Wallaby grass	x																1
Scaevola crassifolia	Cushion Fanflower					x												1
Stenanthera conostephioides	Flame Heath					x												1
Styphelia humifusa	Native Cranberry							x										1
Styphelia rufa	Ruddy Beard-heath									x			x	x	x			4
Tetragonia implexicoma	Bower Spinach					x									x			2
	Total	2	3	1	2	11	3	5	3	3	0	2	6	6	11	5	0	

Figure 10 Example of very severely grazed *Calytrix tetragona*

Regeneration of Native Trees and Shrubs

Observation of natural regeneration of native trees and shrubs does show that a wide range of species are regenerating, and the regeneration score for most of the zones considered to be in Good or Excellent condition was moderate to good (Table 11). But regeneration in zones in moderate to poor conditions was much lower. The extent to which low regeneration can be attributed to grazing pressure compared to lack of healthy adult plants cannot be determined and it is likely that both factors are contributing.

Table 11 Native species regeneration in each BAM quadrat

		Zone															
Scientific name	**Common name**	1*	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18
Acacia paradoxa	Kangaroo Thorn	+		+								+					
Acacia pycnantha	Golden Wattle		++		+		+	+++	+	+	+	+		+	++		
Allocasuarina verticillata	Drooping Sheoak	+			++	+++	++		+			++		+	+		
Alyxia buxifolia	Sea Box				++	+++	+					+	+	+++			
Atriplex semibaccata	Berry Saltbush										+						
Banksia marginata	Silver Banksia**				+	++	+++	++		+							
Billardiera cymosa	Sweet Apple-berry						+	+									
Calytrix tetragona	Common Fringe-myrtle	+			+	++	++	+++	+++	+		+++	+++	+++	+		
Carpobrotus rossii	Karkalla				+++												
Clematis microphylla	Old Man's Beard											++		+++	+		
Correa reflexa ssp.	Correa							+++	+++								
Cryptandra tomentosa	Cryptandra													+++			
Dodoneaea viscosa ssp. spatulata	Sticky Hop-bush	+										+					
Eucalyptus camaldulensis	Red Gum		+	+++													
Eucalyptus fasciculosa	Pink Gum	+			+							++			+		
Eucalyptus microcarpa	Grey Box	+															
Eucalyptus porosa	Mallee Box			+					+								
Goodenia amplexans	Clasping Goodenia					++											
Hardenbergia violacea	Native Sarsparilla														+		
Hibbertia devitata	Smooth Guinea-flower						+							+			
Hibbertia virgata	Twiggy Guinea-flower							+									
Klematis microphylla	Old Man's Beard													+++			
Kunzea pomifera	Muntries				+		++	+++	+			++			+++		
Lasiopetalium sp.	Velvet-bush					+											
Leptospermum myrsenoides	Tea Tree							+	+	+							
Leucopogon parviflorus	Coast Beard-heath				+	+											
Melaleuca lanceolata	Dryland Tea-tree														+		
Myoporum insulare	Common Boobialla	+			+			+				++		+	+		
Olearia axillaris	Coast Daisy-Bush		+		+							+			+	+	
Olearia ramulosa	Twiggy Daisy-bush	+															
Pimelea sp.	Rice-flower							++									
Pittosporum angustifolium	Native Apricot	+					+		+								
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush	+++		+	+++	+	+	+	+		+++	++	+	+	+++	+++	
Santalum murrayanum	Bitter Quandong																
Scaevola crassifolia	Cushion Fanflower				+		+										
Styphelia humifusa	Cranberry Heath							+	+								
Styphelia rufa	Ruddy Beard-heath					+		+		+		+		+++			
Tetragonia implexicoma	Bower Spinach				+++	+		+				+			++		
Thomasia petalocalyx	Paper-flower						+										
Threlkeldia diffusa	Coast Bonefruit														+		
Xanthorrhoea semiplana ssp	Yakka					+	+	+	+			++					
Total number		10	3	4	14	11	13	15	11	5	3	15	3	11	13	2	0
BAM score out of 12		10.5	4.5	4.5	12	10	12	12	7.5	1	3	12	3	6	10.5	3	0

+ = up to 5 ++ = up to 10 +++ = more than 10

*Zones 1a, 1,b and 1c combined across quadrats so the result is over-representing regeneration

**It was unclear to what extent Banksias were regenerating from seed vs suckering

Implications and recommendations

While it is likely that kangaroos occurred in the area pre-European colonisation, the Field Naturalist survey in 1969 did not record any kangaroos (Wollaston 1989), and members of the FoAS recall only ever seeing a small number that would come during Winter and then move back to the Hills in the drier months. It is likely that the presence of a permanent water source at the Hart Road wetlands is able to support a higher population of kangaroos throughout the year, and there are also reports of local residents providing water for kangaroos. The combination of availability of water and lack of predators are likely contributors to the high kangaroo population and vegetation condition (Morris et al. 2017). In the longer term the population 'boom' is likely to be followed by a 'bust' with concerning animal welfare outcomes and distress for local communities (e.g. McMurtie & Kerle 2021)

The lack of recruitment and regeneration exhibits the potential inability of plants to naturally regenerate and grow to a flowering/seeding stage, as palatable seedlings serve as a food source for famishing kangaroos under food pressure. Combined with the lack of native grasses outside of exclusion zones due to overgrazing, this raises the question to whether the local kangaroo population meets their nutritional requirements. Accumulated concerns of animal welfare and evident implications on overall biodiversity create the need for a kangaroo population management program in scrub (San Diego Zoo Wildlife Alliance, 2024).

Until the implementation of such strategies, effort should be placed toward the protection of regenerating species present (e.g. Figure 12) and planting with protection of more palatable species into areas where regeneration is not occurring. As larger fenced exclusion zones may have negative impacts in their construction phase as well as a higher cost, a broader "paddock tree" protection approach is generally recommended. This method has already been partially established with plantings along the southern/eastern boundaries of the park. However in more open areas, additional exclusion areas may be feasible and may also provide an educational tool. The exacerbated weed pressure from exotic grasses evident in the existing exclusion zones can also be addressed by heavily protecting individual plants rather than larger parcels.

Based on this assessment as well as observation of the FoAS and the document and data review it is concluded that the current grazing pressure within the Scrub is having a negative impact on the native vegetation condition, including reducing:

- Understorey species diversity,
- Recruitment of tree and shrub species in more degraded zones,
- The effectiveness of the FoAS to restore degraded areas and re-establish species, and
- Soil cover and exposing soil to wind erosion.

These effects will have long term implications for the sustainability of the current biodiversity and reduce the potential for recovery of degraded biodiversity. Management of kangaroo grazing pressure is a very high priority to meet the objectives of this plan. In the short term, the establishment of more exclosures to provide protection for impacted flora species as well as for establishing grazing resistant species that may spread beyond the fenced areas is recommended.

Figure 11 Paxton Patch - a fenced off area in zone 16 (now 14) demonstrating the density of native vegetation cover in the fenced area (left) compared to area where kangaroos can access

Figure 12 Small-scale mesh-guard for grazing protection for sensitive species (*Dillwynia hispida* in zone 6, left) and fallen branches protecting a Pink Gum seedling (right).

Changes in water regime

Fatchen (1986) provides an overview of the historical hydrology of the Aldinga Scrub, and presents the following quote describing of the swamps and lagoons:

> "…when Europeans first arrived in the area, the scrub stood much as it does now with tall Red Gums (*Eucalyptus camaldulensis*) in the top north-east corner standing in winter in 2-3 feet of water and with a shallow lagoon stretching a quarter of a mile northward. Along the eastern boundary was a swamp, damp and boggy most of the year and developing to the south of the scrub into a large lagoon known as Blue Lagoon… some 6 feet deep … The whole drainage system of the upper Aldinga Sellicks plateau drained into the depression south of the scrub." (Gardner 1973 in Fatchen 1986)

Fatchen (1986) describes Cliff's Waterhole as one of a number of permanent waterholes, existing as part of a series of Lignum (*Duma florulenta*) swamps. For six months of the year the Scrub was only accessible from the north and west due to the lagoons and swamps along the eastern and southern edges. The scrub soils are predominantly free-draining sands overlying a semi-permeable clay, and lateral flow from the wetlands would have resulted in a perched aquifer in the sands, however the extent over which this occurred is unknown (EA 2012).

Drainage of the wetlands in the Washpool area began in the 1900's, leading to the Blue Lagoon becoming less frequently wet and eventually eliminated by post-war drainage channels (Fatchen 1986). Drainage of the Washpool and additional drains in and around the Scrub began to be reported drying from the 1950s (EA 2012). Common Reed (*Phragmites australis*) and Bulrush (*Typha sp.*), which are reliant on inundation and permanent soil moisture, were considered common in 1973 but by 1986 were no longer present (Fatchen 1986). Prickly Tea-tree (*Leptospermum contintale* Syn *L. juniperum*), another species reliant on high soil moisture, was present in MU9 (now MU7) but was not recorded in this or recent surveys.

The swamp areas were fringed with many dead River Red Gums by 1986, with no regeneration of this species, but Pink Gums growing on the margins were taller than elsewhere in the Scrub (Fatchen 1986). Fatchen considers that the majority of the Scrub vegetation (excepting the dunes, including inland dunes)) was most likely historically dependent on high groundwater resulting from lateral, subsurface flow of water from the wetlands. Areas of Mallee Box woodlands occur on heavier loam soils with limestone that are likely supported by local rainfall and waterlogging (Fatchen 1986).

Following urban development of areas to the north of the scrub, from 2008, stormwater run-off was directed to a wetland outside but adjacent to the northern boundary of the Scrub, "Hart Road Wetland." The Hart Road wetlands are located in an area that was part of the historical wetland system, but has been engineered for stormwater capture. The entry of water into the Scrub was also altered from the natural point close to Rowley Road to further east. The intention was that water would flow into the scrub by underground seepage and occasional surface flows, however stormwater flows exceeded expectations resulting in more flow into the scrub wetlands. Excess flows are blocked from extending eastwards by a bank and channel constructed along the eastern boundary of the scrub that directs flow south to Cox Road drain (EA 2012).

The effects of returning water to the Scrub wetland were considered to be largely beneficial, with prolific regeneration of River Red Gums and return of wetland plant species including Bulrush, Common Reed. Beyond the wetland perimeter, sedgelands have been promoted and there has been improved health of Pink Gums. Waterbirds and frogs have also become prolific

Since the increased inflows to the wetlands, some terrestrial vegetation including Pink Gums and Drooping Sheoaks that had colonised the basins has been drowned, but EA (2012) considered that there was little evidence of terrestrial vegetation beyond this suffering poor health from water-logging.

Inflows to the wetlands are now more frequent than they would have been pre-development because of high run-off hard surfaces, causing the wetlands and waterholes in the Scrub remain full or near-full for longer (EA 2012). The Hart Road wetland is now permanent (FoAS pers. com. 01/25). At the time of this assessment, further development for housing and expansion of Main South road was underway. These will cause additional rainfall run-off but where this will be directed and how it may

affect the Scrub was beyond the scope of this assessment. EA (2012) recommends that the wetland environmental water requirements are a seasonal water cycle that includes wetting and drying.

There are a number of bores which had been monitored, however EA (2012) reviewed existing bores in the Scrub and found most were not well constructed and have not been maintained and provided little useful data.

Recommendations for managing environmental water requirements are provided in more detail in EA (2012) and are still considered valid:

1. Provide a seasonal water regime in the Aldinga Scrub Wetlands.
2. Relocate infrastructure to manage excess stormwater outside the [Scrub].
3. Rehabilitate groundwater monitoring bores and continue groundwater monitoring.
4. Survey vegetation and monitor risks.
5. Monitor ecosystem and review management.

Fire Management

The fire history of the Aldinga Scrub is shown in Figure 13, and shows that there have been few fires in the Park since 1931 (start of records). Two prescribed burns have been undertaken (2009 and 2011), all other fires shown are bushfires. A number of smaller burnt areas were observed during the surveys, probably the result of illegal campfires.

There are currently no proposed prescribed burns for the Park (based on information on Naturemaps website). The regional fire management plan for Aldinga CP (DENR 2011) sets out the key requirements for designated fire management zones, including:

- Asset protection zones (A)
- Bushfire Buffer Zones (B)
- Conservation Zones (C).

The location of the zones as well as future planned prescribed burns are provided on DEW's Fire Management Maps website:

http://spatialwebapps.environment.sa.gov.au/firemaps/?viewer=firemaps

The ecological fire management guidelines for South Australia (DEWNR 2013)

DENR (2011) notes that the effect of fire on the endemic Aldinga Dampiera was limited, although it was known to regenerate immediately post-fire. There are also a number of threatened orchids in isolated areas within the Park, about which there was little knowledge of their response to burning at the time the plan was prepared. Experimental burning was recommended for both threatened orchids and Aldinga Dampiera (*Dampiera lanceolata* var. *intermedia*) and implementing ecological burning if required with monitoring (DENR 2011). As shown in Figure 13, no prescribed burns have occurred since and therefore it is concluded this is still a knowledge gap. The regionally rare Buckbush Wheel-fruit (*Gyrostemon australasicus)* regenerated in the area burnt in the 2009 prescribed burn (FoAS pers. com. 2024) after only being recorded once before in 1984.

While there is significant build-up of dead material around some plants such as the base of Yackas, kangaroo grazing appears to be largely keeping fuel loads low, although a proper fuel load assessment is required to confidently map fuel levels across the park. There are however several areas containing sensitive species that have been fenced to exclude kangaroos. As noted above these areas have more native understorey, but also ungrazed growth of Perennial Veldtgrass, the combination of which may mean there are higher fuel loads in these areas making them more at risk if a fire occurred in them.

The ecological fire management guidelines for South Australia (DEWNR 2013) outline the recommended fire regime for major vegetation groups including those found at Aldinga Scrub. DENR (2011) identifies the fire response and ecological fire management guidelines for two ecological communities of conservation significance found in Aldinga Scrub (Grey Box grassy woodland and Mallee Box woodland). DEW has commended the redevelopment of fire management plans for the Adelaide and Mt Lofty Ranges which will include the Aldinga Scrub.

Any future burns (planned or unplanned) would need to be managed afterwards for the likely preferential grazing pressure on regenerating plants (i.e. install guards or exclosures around sensitive species), as well as the regeneration of weeds and opportunity to control them before they set seed, depleting the soil seed bank.

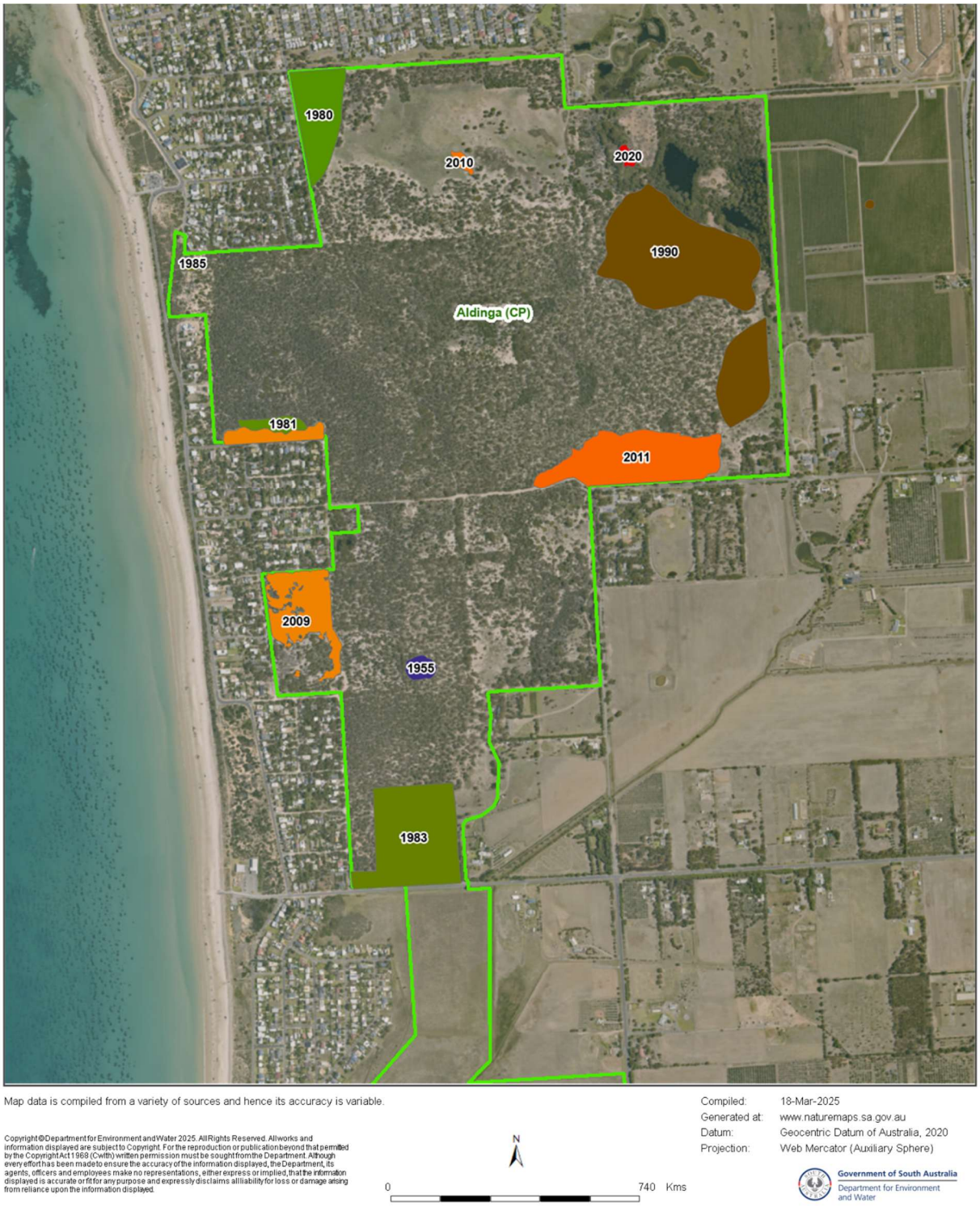


Figure 13 Recorded fires in Aldinga Scrub by year (source: Naturemaps)

Poor Tree & Yacka Health

Poor tree health was raised as a concern by FoAS, particularly for Pink Gums. This assessment did not include a detailed measure of tree health[4] however it was noted that Pink Gums in some areas are in poor condition. The BCM monitoring undertaken by the FoAS provides a more detailed assessment of tree health at three sites but the results are combined with other habitat features. The tree health data alone has not been analysed. Fatchen (1989) noted poor health of large Pink Gums on lower areas, with possible causes including soil disease, water stress and groundwater salinity. It is recommended that a more detailed survey and monitoring of Pink Gums be undertaken and incorporate possible causal factors (e.g. groundwater monitoring and soil health).

In some areas, large old Yackas (*Xanthorrhoea semiplana ssp. semiplana and X. semiplana ssp. tateana*) are very unhealthy, which is probably a symptom of the root disease *Phytophthora cinnamomi* (Pc) which occurs in the Park (DENR 2011). There appears to have been limited testing for Pc (see Naturemaps mapping) and the extent of the disease is unknown, however it should be assumed to be present and the *Phytophthora Management Guidelines* (PTG 2006) should be followed.

Recreational Impacts

There is a small amount of unauthorised recreation occurring in the scrub, including walking off-tracks, camping, using unauthorised trails, dog exercising and having picnic fires. The effects of this are relatively localised, generally resulting in some localised rubbish and clearance and do not appear to be having a major impact on vegetation condition. But there is potential to spread Pc and weeds, cause harm to ground-dwelling fauna, and of particular concern is the risk that a bushfire could start. With the increasing urbanisation of surrounding areas the Scrub is likely to come under increasing recreational pressure in future. Mitigation measures should include ensuring a compliance presence within the Scrub in combination with educational signage and other community education.

Historical clearance patterns and lack of large trees and hollows

While much of the "original" scrub is considered uncleared remnant vegetation, most eucalypt trees are multi-trunked, with small stems that lack hollows, while there are many large dead tree stumps scattered throughout the Scrub indicating larger. It is likely that many areas have been selectively logged for timber, resulting in few large old trees and consequently a limited number of tree hollows, especially large hollows. The vegetation assessment recorded hollows in only 9 of the 21 vegetation quadrats and only 4 contained large hollows. Fauna that require hollows therefore have limited habitat, and some tree hollows are occupied by feral bees, further reducing the availability of hollows.

The FoAS undertake regular bird monitoring and have recorded a number of hollow-nesting species, however it was beyond the scope of this assessment to determine how many hollow-nesting species occur and to what extent they are nesting at the site or just coming for non-breeding activities (i.e. feeding).

[4] The BAM indicator for tree health is only a broadscale assessment, combining multiple species where present and including a measure of the percent of the canopy against expected canopy.

Figure 14 Example of large old stumps in zone 14 indicating large trees have historically been cleared, reducing the cover of mature trees and number of trees with large hollows.

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APPENDIX 1: RELATIONSHIP BETWEEN MANAGEMENT UNITS AND 2014 ZONES

Table 12 Management units related to 2014 Zones

New MU	2014 Zone	Change reason	Vegetation description
1	1a	Previous MU boundary with slight adjustments	Mallee Box and Pink Gum revegetated open woodland
2	1b	Previous MU except sedgelands	Exotic herbland
3	1c	Previous MU with slight adjustments	Drooping Sheoak, Mallee Box and Pink Gum low open woodland
4	4	Previous MU	Coastal shrubland and Heath
5	5, 6 & most of 7	Similar vegetation composition and condition	Drooping Sheoak and Pink Gum low woodland
6	Part 7, part 8	Distinct vegetation association	Mallee Box woodland
7	9 and part 8	Distinct vegetation association and past clearance	Pink Gum and Pittosporum
8	Most of 8	Similar vegetation composition and condition	Pink Gum and Drooping Sheoak woodland
9	Most of 10	Similar vegetation composition, condition declines eastwards	Pink Gum woodland
10	Most of 2	Wetlands and associated zones	River Red Gum forest, aquatic herbland, sedgelands and open shrublands
11	3	Previous MU	Pink Gum grading to River Red Gum revegetated woodland
12	Part 10 and all 11	High level of historic disturbance	Exotic grassland/ herbland with Pink Gums and non-local plantings
13	Part 12	Constructed wetland	Bulrush and Lignum stormwater wetland
14	13, 15, 16 and part 12	Similar vegetation composition and condition	Drooping Sheoak & Pink Gum low open woodland
15	Most of 14	Range of disturbance levels across MU	Pink Gum and Drooping Sheoak low open woodland
16	Part 14	Distinct vegetation association	Grey Box woodland with Mallee Box
17	17	Previous MU	Drooping Sheoak & Pink Gum low open woodland
18	18	Previous MU	Bracken Fern fernland grading to Spiny Flat-sedge sedgeland

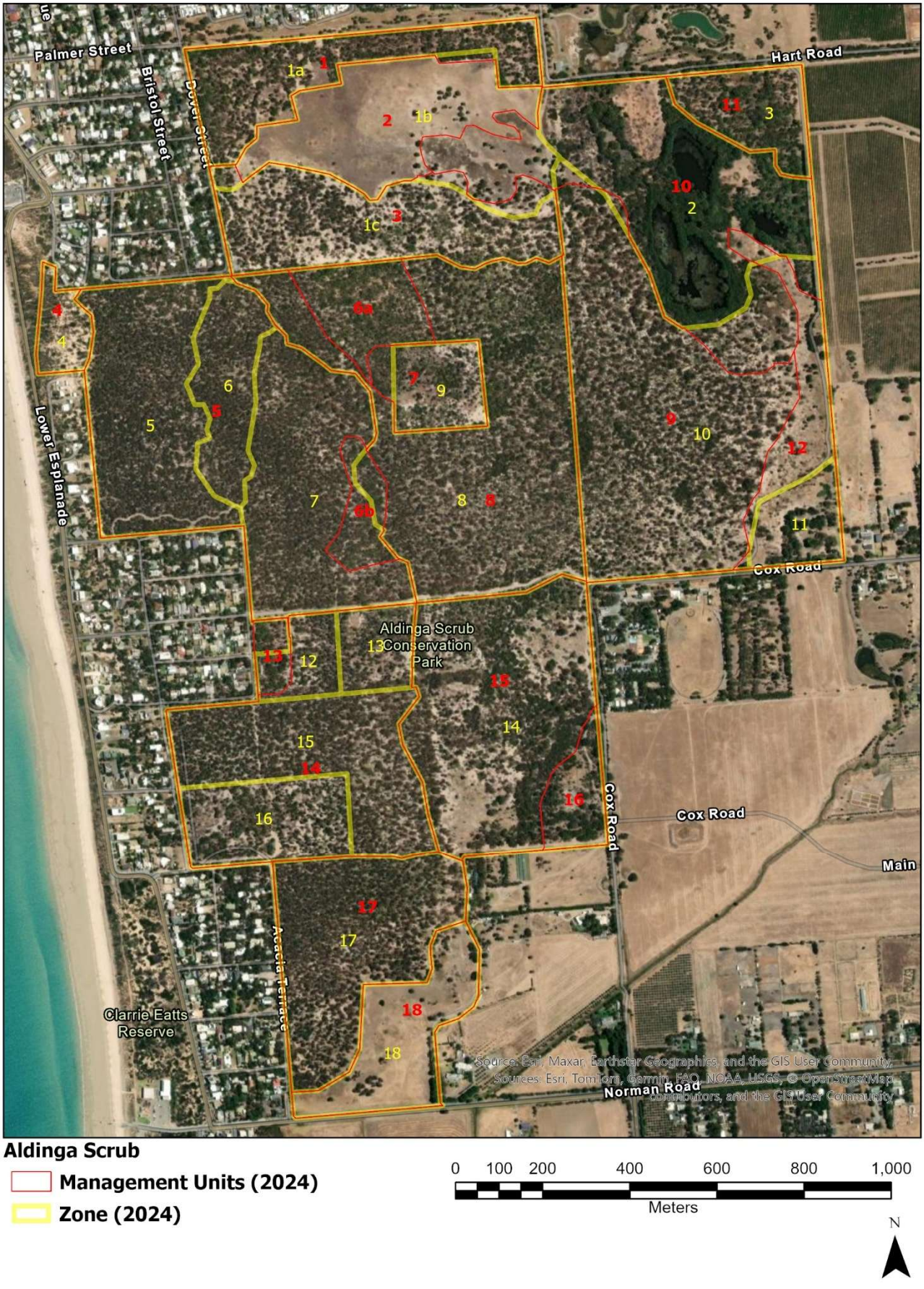


Figure A15 Location of 2024 Management Units and 2014 Zones with vegetation condition rating for 2014 management zones

APPENDIX 2: VEGETATION SURVEY RESULTS FOR EACH ZONE

The BAM results for each quadrat are presented below

Zone	Vegetation description	BCM	Species diversity	Species Diversity Score (/30)	Regen-eration Score (/12)	Weed Score (/15)	Native Plant Life Forms Score (/20)	Fallen Timber/ Debris (/5)	Hollow-bearing trees (/5)	Mature Tree (/8)	Tree Canopy cover (/5)	Veg Con Score (/80)	UBS
1a	Eucalyptus porosa +/- E. fasciculosa open woodland over Acacia paradoxa & Rhagodia candolleana	SMLR 2	21	18	10.5	4	16	3.5	0	4	4	33	45
1b	Exotic herbland	SMLR 2	6	6	1.5	2	2	0.5	0	0	0	2	2
1c	Allocasuarina verticillata +/- Eucalyptus porosa, +/- E. fasciculosa low open woodland over Pteridium esculentum, Kunzea pomifera & Lepidosperma congestum	SMLR 2	32	24	4.5	6	16	3.5	1	5	3	47	63
2	Eucalyptus camaldulensis forest over Juncus pallidus and Typha domingensis	SMLR 6.1	12	16	4.5	10	16	1.5	1	8	5	44	71
3	Eucalyptus fasciculosa +/- Allocasuarina verticillata, E. porosa woodland over Acacia paradoxa & exotic herbs (E. camaldulensis over Juncaceae to the east)	SMLR 2	25	20	4.5	4	12	5	0	5	5	35	46
4	Acacia longifolia ssp. sophorae, +/- Allocasuarina verticillata, +/- Olearia axillaris, +/- Myoporum insulare open shrubland over Kunzea pomifera and Spinifex hirsutus	SMLR Co 7.2	41	30	12	6	20	NA	NA	NA	NA	71	93
5	Allocasuarina verticillata +/- Eucalyptus fasciculosa low woodland over Alyxia buxifolia, Thomasia petalocalyx, Calytrix tetragonia, Konzea pomifera, Helichrysum leucopsideum	SMLR 2	59	30	10	8	20	5	1	5	5	67	93
6	Allocasuarina verticillata +/- Eucalyptus fasciculosa low woodland over Alyxia buxifolia, Calytrix tetragona, Kunzea pomifera, Helichrysum leucopsideum	SMLR 2	54	30	12	7	20	5	1	7	5	68	95
7	Allocasuarina verticillata +/- Eucalyptus fasciculosa woodland over Xanthorrhea semiplana ssp. tateana, Calytrix tetragona & Kunzea pomifera	SMLR 2	55	30	12	9	20	5	2	7	5	70	105

Zone	Vegetation description	BCM	Species diversity	Species Diversity Score (/30)	Regen-eration Score (/12)	Weed Score (/15)	Native Plant Life Forms Score (/20)	Fallen Timber/ Debris (/5)	Hollow-bearing trees (/5)	Mature Tree (/8)	Tree Canopy cover (/5)	Veg Con Score (/80)	UBS
8	Eucalyptus fasciculosa +/- Allocasuarina verticillata woodland over Calytrix tetragona, Xanthorrhea semiplana, Acacia pycnantha & Lepidosperma canescens	SMLR 2	42	26	7.5	9	18	5	2	8	5	62	86
10	Eucalyptus fasciculosa woodland over Acacia pycnantha Rhagodia candolleana, Kunzea pomiferea	SMLR 2	30	22	1	5	16	5	1	5	5	44	66
11	Non-local Eucalypus spp. and Melaleuca spp. over exotic grasses and herbs	SMLR 2	15	12	3	5	8	4	0	1	1	10	14
13	Allocasuarina verticillata, +/- Eucalyptus fasciculosa low open woodland over Calytrix tetragona, Rhagodea candolleana and Kunzea pomifera	SMLR 2	36	24	12	7	14	4	0	4	4	52	68
14	Eucalyptus fasciculosa +/- Allocasuarina verticillata woodland over A. paradoxa, Calytrix tetragona over Kunzea pomifera & Ehrharta calycina	SMLR 2	29	22	3	6	16	5	2	4	5	45	76
15	Eucalyptus fasciculosa +/- Allocasuarina verticillata low open woodland over Alyxia buxifolia, Callytrix tetragona & Leucopogon parviflorus over Lepidosperma spp.	SMLR 2	40	26	6	8	18	4	0	6	5	55	75
16	Allocasuarina verticillata +/- Eucayptus fasciculosa low open woodland over Rhagodia Candolleana	SMLR 2	40	26	10.5	7	16	3.5	0	4	3	53	71
17	Allocasuarina verticillata, +/- Eucalyptus fasciculosa woodland over Leucopogon parviflorus, Rhagodia candolleana, Pterideum esculentum & Ehrharta calycina	SMLR 2	20	16	3	3	18	4.5	4	5	5	42	57
18	Pteridium esculentum +/- Ehrharta calycina fernland grading to Cyperus gymnocaulos and Ehrharta calycina sedge land with emergent Allocasuarina verticillata & Acacia longifolia ssp. sophorae	SMLR 2	15	12	0	4	8	0.5	0	2	0	8	11

APPENDIX 3: LIST OF FLORA

NATIVE FLORA

Table A1.1 lists all native species recorded during this survey and the zone they were recorded in, the lists include all species within the BAM quadrat as well as observations outside the quadrat, however it should be noted that the areas outside the quadrat were not surveyed comprehensively. Ep = Eucalyptus porosa areas, Em = E. microcarpa area, Pp = Pittosporum paddock

Table A1.1 Native flora species observed this survey

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Acacia acinacea	Wreath Wattle		NT	+		+					+								+			
Acacia cupularis	Cup Wattle		R	+			+	+	+													
Acacia longifolia ssp. sophorae	Coastal Wattle						+	+								+		+	+	+	+	
Acacia paradoxa	Kangaroo Thorn			+	+	+		+			+		+	+		+	+	+	+	+		+
Acacia pycnantha	Golden Wattle				+	+	+	+	+	+	+		+	+		+	+	+	+	+	+	+
Acacia spinescens	Spiny Wattle			+				+													+	
Acaena echinata	Sheep's Burr				+																	
Acianthus pusillus	Mosquito Orchid							+	+	+			+									
Acrotriche patula	Prickly Ground-berry		NT				+															
Allocasuarina verticillata	Drooping Sheoak			+		+	+	+	+	+	+			+		+	+	+	+	+	+	
Alternanthera denticulata	Lesser Joyweed				+																	
Alyxia buxifolia	Sea Box		R				+	+	+	+	+						+	+	+	+		
Amyema miquelii	Box Mistletoe				+	+	+	+	+	+			+	+		+	+	+	+	+		+
Arthropodium sp.	Vanilla-lily								+													
Arthropodium strictum	Common Vanilla-lily							+			+		+									
Atriplex semibaccata	Berry Saltbush													+	+							
Austrostipa elegantissima	Feather Spear-grass							+														
Austrostipa sp.	Spear-grass						+	+			+					+		+				
Banksia marginata	Silver Banksia							+	+	+			+				+		+	+	+	
Beyeria lechenaultii	Pale Turpentine Bush		NT				+	+	+		+					+						
Billardiera cymosa ssp. cymosa	Sweet Apple-berry				+			+	+	+	+		+				+					

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Billardiera versicolor	Yellow-flower Apple-berry		VU				+															
Bulbine semibarbata	Small Leek-lily		VU								+											
Bursaria spinosa ssp. spinosa	Bursaria																	+				
Caesia calliantha	Blue Grass-lily									+	+											
Caladenia latifolia	Pink Caladenia		NT					+		+												
Caladenia sp.	Spider-orchid									+												
Calandrinia calyptrata	Pink Purslane		NT						+	+	+		+									
Calandrinia eremaea	Dryland Purslane		NT				+	+	+	+	+		+					+				
Calandrinia granulifera	Pigmy Purslane		NT					+														
Calytrix tetragona	Common Fringe-myrtle						+	+	+	+			+			+	+	+	+	+		
Carex sp.	Sedge												+	+							+	
Carpobrotus rossii	Native Pigface						+	+	+	+			+								+	
Cassytha glabella f. dispar	Slender Dodder-laurel										+							+	+			
Cassytha peninsularis	Peninsula Dodder-laurel									+												
Cassytha pubescens	Downy Dodder-laurel						+	+	+				+				+			+		
Cassytha sp.	Dodder-laurel						+									+						
Centipeda cunninghamii	Common Sneezeweed		NT		+	+																
Centrolepis strigosa ssp. strigosa	Hairy Centrolepis							+	+				+									
Cheilanthes austrotenuifolia	Annual Rock-fern										+		+				+	+		+	+	+
Chenopodium sp.	Goosefoot																				+	
Chorizandra enodis	Black Bristle-rush		R								+											
Clematis microphylla	Old Man's Beard							+	+	+	+		+			+	+	+	+	+		+
Comesperma calymega	Blue-spike Milkwort							+	+	+	+							+				
Convolvulus remotus	Grassy Bindweed												+									
Convolvulus sp.	Bindweed																+	+				
Correa reflexa var. reflexa	Common Correa									+	+											
Correa reflexa var. scabridula	Common Correa		R								+											
Corybas sp.	Helmet-orchid										+											
Cotula coronopifolia	Water Buttons				+																	
Chamaescilla corymbosa	Blue Squill																					

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Crassula colligata ssp. colligata				+			+	+	+	+	+		+			+			+			
Crassula decumbens var. decumbens	Spreading Crassula				+					+												
Crassula sieberiana	Sieber's Crassula			+																		
Cryptandra tomentosa	Heath Cryptandra							+		+								+				
Cyperus gymnocaulos	Spiny Flat-sedge				+																+	
Dampiera lanceolata var. intermedia	Aldinga Dampiera	E	E					+	+													
Dianella brevicaulis	Short-stem Flax-lily						+	+	+				+						+		+	
Dianella sp.	Flax-lily										+											
Dillwynia hispida	Red Parrot-pea								+													
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			+	+				+							+			+			
Duma florulenta	Lignum		VU	+	+										+							
Einadia nutans ssp. nutans	Climbing Saltbush																+					
Eleocharis sp.	Spike-rush												+									
Enchylaena tomentosa var. tomentosa	Ruby Saltbush			+		+								+			+		+			
Epilobium billardierianum ssp. cinereum	Variable Willow-herb				+																	
Epilobium hirtigerum	Hairy Willow-herb				+	+																
Erodium sp.	Heron's-bill/Crowfoot															+						
Eucalyptus camaldulensis ssp. camaldulensis	River Red Gum			+	+	+								+								
Eucalyptus cladocalyx ssp. cladocalyx	Sugar Gum													+								
Eucalyptus fasciculosa	Pink Gum	R	NT	+		+	+	+	+	+	+		+	+		+	+	+	+	+	+	
Eucalyptus leucoxylon ssp.	South Australian Blue Gum													+								
Eucalyptus microcarpa	Grey Box			+		+							+			+	+					
Eucalyptus porosa	Mallee Box		NT	+		+		+	+		+					+	+		+		+	+
Eucalyptus sp.														+							+	
Euchiton involucratus	Star Cudweed										+		+									
Euchiton sp.	Cudweed					+			+									+	+			
Eutaxia microphylla	Common Eutaxia									+	+							+				
Exocarpos cupressiformis	Native Cherry												+									

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Ficinia nodosa	Knobby Club-rush			+	+		+	+					+		+	+	+		+	+	+	
Gahnia sp.	Saw-sedge														+							
Geranium sp.	Geranium																				+	
Gonocarpus tetragynus	Small-leaf Raspwort							+	+	+	+		+									
Goodenia amplexans	Clasping Goodenia			+				+	+	+	+		+									
Grevillea lavandulacea ssp. lavandulacea	Spider-flower							+														
Hakea rugosa	Dwarf Hakea		NT				+															
Hardenbergia violacea	Native Sarsparilla																					+
Helichrysum leucopsideum	Satin Everlasting		NT				+	+	+	+	+		+			+	+	+		+		
Hibbertia devitata	Smooth Guinea-flower		NT					+	+	+								+				
Hibbertia riparia	Bristly Guinea-flower							+					+									
Hibbertia sp.	Guinea-flower																+		+			
Hibbertia virgata	Twiggy Guinea-flower		NT					+	+	+												
Isolepis sp.	Club-rush				+	+									+				+			
Isopogon ceratophyllus	Horny Cone-bush							+														
Juncus bufonius	Toad Rush				+										+							
Juncus pallidus	Pale Rush			+	+	+							+									
Juncus subsecundus	Finger Rush				+	+																
Kennedia prostrata	Scarlet Runner																				+	
Kunzea pomifera	Muntries		R				+	+	+	+	+		+			+	+	+	+	+		
Lagenophora gunniana	Coarse Bottle-daisy										+											
Lagenophora sp.	Bottle-daisy									+	+											
Lepidosperma canescens	Hoary Rapier-sedge							+	+	+	+						+					
Lepidosperma concavum/congestum/laterale	Sword-sedge						+			+	+					+	+	+	+	+		
Lepidosperma sp.	Sword-sedge/Rapier-sedge							+	+						+			+				
Leptospermum myrsinoides	Heath Tea-tree						+	+	+	+	+		+			+	+					
Leucophyta brownii	Coast Cushion Bush		NT				+															
Leucopogon parviflorus	Coast Beard-heath		NT		+		+	+	+	+	+		+	+		+	+	+	+	+	+	
Liliaceae sp.	Lily Family									+												

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Lomandra collina	Sand Mat-rush		R				+															
Lomandra micrantha ssp. micrantha	Small-flower Mat-rush							+	+	+	+					+		+	+	+		
Lomandra sp.	Mat-rush																+					
Lotus australis	Austral Trefoil		NT	+																		
Lysiana exocarpi ssp. exocarpi	Harlequin Mistletoe			+		+	+		+		+		+	+		+		+	+	+		
Lysiana sp.	Mistletoe							+		+												
Lythrum hyssopifolia	Lesser Loosestrife				+	+									+							
Machaerina juncea	Bare Twig-rush			+	+											+	+					
Maireana enchylaenoides	Wingless Fissure-plant			+																		
Marsilea drummodii	Nardoo				+																	
Melaleuca acuminata ssp. acuminata	Mallee Honey-myrtle			+																		
Melaleuca brevifolia	Short-leaf Honey-myrtle		VU											+								
Melaleuca lanceolata	Dryland Tea-tree		R			+					+			+		+	+		+			
Microtis arenaria	Notched Onion-orchid								+	+												
Millotia tenuifolia var. tenuifolia	Soft Millotia							+	+													
Muehlenbeckia gunnii	Coastal Climbing Lignum			+	+		+	+		+				+		+	+			+	+	
Myoporum insulare	Common Boobialla		NT	+	+	+	+	+		+	+		+	+		+		+	+	+	+	
Myoporum parvifolium	Creeping Boobialla	R	R	+																		
Myoporum petiolatum	Sticky Boobialla		NT										+									
Myoporum sp.														+								
Myriophyllum verrucosum	Red Milfoil		NT		+																	
Neurachne alopecuroidea	Fox-tail Mulga-grass							+	+	+	+							+				
Olearia axillaris	Coast Daisy-bush		NT	+	+		+	+	+		+		+			+	+	+	+	+	+	
Olearia passerinoides ssp. glutescens	Sticky Daisy-bush	R	VU															+	+			
Olearia ramulosa	Twiggy Daisy-bush			+			+	+		+	+						+	+				
Olearia sp.	Daisy-bush							+														
Opercularia scabrida	Stalked Stinkweed		NT					+	+	+	+											
Opercularia turpis	Twiggy Stinkweed		NT						+	+						+		+				
Orchidaceae sp.	Orchid Family									+												

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Persicaria decipiens	Slender Knotweed				+																	
Persicaria prostrata	Creeping Knotweed				+																	
Pimelea glauca	Smooth Riceflower		NT				+		+	+	+											
Pimelea sp.	Riceflower																	+				
Pittosporum angustifolium	Native Apricot			+		+			+	+	+					+	+		+		+	+
Podotheca angustifolia	Sticky Long-heads		NT					+	+													
Polygonum plebeium	Small Knotweed		NT		+																	
Pomaderris paniculosa ssp. paralia	Coast Pomaderris		R				+															
Poranthera microphylla	Small Poranthera							+	+	+												
Pseudognaphalium luteoalbum	Jersey Cudweed														+							
Pteridium esculentum ssp. esculentum	Bracken Fern						+	+	+	+			+				+		+	+	+	
Pultenaea tenuifolia	Narrow-leaf Bush-pea		R				+															
Pyrorchis nigricans	Black Fire-orchid							+	+	+	+											
Rhagodia candolleana ssp. candolleana	Sea-berry Saltbush			+	+	+	+	+	+	+	+		+	+		+	+	+	+	+		+
Rhagodia parabolica	Mealy Saltbush		R	+																		
Rytidosperma sp.	Wallaby-grass			+		+	+	+		+	+			+		+	+	+	+			
Santalum acuminatum	Quandong		R				+	+	+	+	+					+	+	+	+	+		
Santalum murrayanum	Bitter Quandong		VU					+	+													+
Scaevola albida	Pale Fanflower										+											
Scaevola angustata	Coast Fanflower		VU						+	+												
Scaevola crassifolia	Cushion Fanflower		VU				+															
Scaevola sp.	Fanflower																				+	
Senecio phelleus	Woodland Groundsel					+																
Senecio picridioides	Purple-leaf Groundsel			+						+			+									
Senecio quadridentatus	Cotton Groundsel			+													+		+			
Senecio sp.	Groundsel							+														
Senecio spanomerus	Native Groundsel		NT	+			+															
Spinifex hirsutus	Rolling Spinifex						+															
Stackhousia monogyna	Creamy Candles		NT								+											

Species	Common Name	SA	FLB	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18	Ep	Em	Pp
Stemodia florulenta	Bluerod		not listed		+	+																
Stenanthera conostephioides	Flame Heath							+	+	+	+											
Styphelia humifusa	Cranberry Heath						+	+	+	+			+			+	+	+				
Styphelia rufa	Ruddy Beard-heath		NT					+	+		+		+			+	+	+	+			
Tetragonia implexicoma	Bower Spinach						+	+	+	+			+			+	+	+	+	+		
Tetraria capillaris	Hair Sedge		R				+															
Thelymitra rubra	Salmon Sun-orchid									+												
Thomasia petalocalyx	Paper-flower		NT				+	+	+	+								+				+
Threlkeldia diffusa	Coast Bonefruit		NT				+	+								+			+			
Thysanotus racemoides	Rush Fringe-lily		VU							+												
Thysanotus patersonii	Twining Fringe-lily							+	+		+		+									
Trachymene pilosa	Dwarf Trachymene						+	+	+	+	+		+			+						
Tricoryne sp.	Yellow Rush-lily							+	+													
Typha domingensis	Narrow-leaf Bulrush				+										+							
Typha sp.	Bulrush					+																
Vittadinia australasica var. australasica	Sticky New Holland Daisy		NT	+							+		+	+		+	+					
Vittadinia cuneata var. cuneata	Fuzzy New Holland Daisy																+					
Vittadinia gracilis	Woolly New Holland Daisy			+							+											
Wahlenbergia aridicola	Dryland Bluebell									+												
Wahlenbergia gracilenta	Annual Bluebell							+	+	+	+		+			+	+	+	+	+		
Wahlenbergia littoricola	Coast Bluebell										+											
Wahlenbergia sp.	Native Bluebell						+		+													
Xanthorrhoea semiplana ssp. semiplana	Yacca			+		+		+	+	+	+					+	+		+	+		
Xanthorrhoea semiplana ssp. tateana	Tate's Grass-tree	R	R							+	+									+		

EXOTIC FLORA

Table A3.2 lists all exotic species recorded during this survey and the zone they were recorded in, whether they are declared under the Landscape SA (2019) and their threat rating for the Southern Mt Lofty Ranges.

Table A3.2 Exotic flora species observed this survey

Species	Common Name	Threat	LSA	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18
Acacia baileyana	Cootamundra Wattle	2											+						
Acacia longifolia ssp. longifolia	Sallow Wattle	3					+					+							
Acacia saligna	Golden Wreath Wattle	2					+	+								+	+		
Aira sp.	Hair-grass	1		+		+	+	+	+	+	+	+	+	+	+	+	+	+	
Aizoon pubescens	Coastal Galenia	2		+	+	+							+				+		+
Anagallis sp.								+	+		+	+							
Arctotheca calendula	Cape Weed	2		+	+	+	+	+	+	+	+	+	+					+	+
Asparagus asparagoides f.	Bridal Creeper	5	Yes	+	+	+		+	+	+			+	+	+	+	+	+	
Asphodelus fistulosus	Onion Weed	2										+	+	+					+
Avena barbata	Bearded Oat	2											+						+
Brassica sp.		2													+				+
Briza maxima	Large Quaking-grass	2					+	+	+	+	+	+		+	+	+	+	+	
Bromus rubens	Red Brome	1			+	+							+	+					
Bromus sp.	Brome	1																	+
Carpobrotus edulis ssp. edulis	Hottentot Fig	2															+		
Cenchrus clandestinus	Kikuyu	3		+									+						
Chrysanthemoides monilifera ssp. monilifera	Boneseed	4	Yes	+			+	+		+	+			+	+	+	+	+	
Cirsium sp.	Thistle	2			+														
Convolvulus arvensis	Field Bindweed	1												+		+			
Conyza sp.	Fleabane	2			+	+							+						
Corymbia maculata	Spotted Gum													+					
Cotula coronopifolia	Water Buttons				+														
Cucumis myriocarpus ssp. myriocarpus	Paddy Melon												+						
Cynara cardunculus ssp. flavescens	Artichoke Thistle	2	Yes	+															+

Aldinga Scrub Vegetation Condition and Change Assessment

Species	Common Name	Threat	LSA	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18
Dittrichia graveolens	Stinkweed	2										+							
Echium plantagineum	Salvation Jane	2	Yes	+	+	+	+				+	+	+		+				+
Ehrharta calycina	Perennial Veldt Grass	4		+	+		+	+	+	+		+	+	+	+	+	+	+	+
Ehrharta longiflora	Annual Veldt Grass	2		+		+		+					+						
Ehrharta villosa var. maxima	Pyp Grass	3					+												
Eucalyptus platypus ssp. platypus	Round-leaved Moort												+						
Eucalyptus utilis													+						
Euphorbia terracina	False Caper	3	Yes														+		
Festuca rubra	Red Fescue	2											+						
Freesia cultivar	Freesia	3													+		+		
Fumaria sp.	Fumitory	1								+	+								
Galium aparine	Cleavers	1															+		
Gazania linearis	Gazania	3	Yes	+															
Geranium molle var. molle	Soft Geranium	1		+															
Gomphocarpus cancellatus	Broad-leaf Cotton-bush	2											+						
Helminthotheca echioides	Ox-tongue	1											+						
Holcus lanatus	Yorkshire Fog	2				+													
Hordeum sp.	Barley Grass	1		+															+
Hypochaeris glabra	Smooth Cat's Ear	1		+	+	+	+	+	+	+		+						+	+
Hypochaeris radicata	Rough Cat's Ear	2																+	+
Isolepis marginata	Little Club-rush	2								+		+							
Juncus usitatus	Common Rush					+													
Kickxia sp.	Toadflax	1			+														
Lactuca sp.	Lettuce	2			+														
Lagurus ovatus	Hare's Tail Grass	2					+	+		+		+	+	+			+	+	+
Lepidium africanum	Common Peppercress	1										+	+						
Leptospermum laevigatum	Coast Tea-tree	3	Yes				+	+					+						
Lolium sp.	Ryegrass	1				+						+	+					+	
Lupinus cosentinii	Blue Lupin	2		+	+														
Lycium ferocissimum	African Boxthorn	3	Yes				+												

Aldinga Scrub Vegetation Condition and Change Assessment

Species	Common Name	Threat	LSA	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18
Medicago polymorpha	Burr-medic	2			+					+		+							
Medicago sp.	Medic	2		+		+							+		+		+	+	+
Medicago truncatula	Barrel Medic	2				+													
Melaleuca armillaris ssp. armillaris	Bracelet Honey-myrtle	2		1		+													
Melaleuca nesophila	Showy Honey Myrtle												+						
Mentha pulegium	Pennyroyal	2				+													
Moraea sp.	Cape Tulip	3	Yes	+															
Oenothera stricta ssp. stricta	Common Evening Primrose	2		+	+								+						
Olea europaea ssp. europaea	Olive	4	Yes		+	+							+		+			+	
Oxalis articulata	Bent Wood-sorrel							+											
Oxalis pes-caprae	Soursob	4		+	+	+				+		+							
Phyla canescens	Lippia	2		+															
Pinus sp.	Pine	3											+						
Plantago coronopus ssp. coronopus	Bucks-horn Plantain	2																+	
Plantago lanceolata var. lanceolata	Ribwort	2			+	+						+	+						
Pseudognaphalium luteoalbum	Jersey Cudweed				+	+													
Reichardia tingitana	False Sowthistle	2															+		
Rhamnus alaternus	Blowfly Bush	3	Yes	+			+	+			+	+						+	
Rosa sp.	Wild Rose/Briar	3	Yes		+	+													
Rumex crispus	Curled Dock	1			+	+													
Salvia verbenaca var. verbenaca	Wild Sage	2										+							
Scabiosa atropurpurea	Pincushion	3												+					
Schinus molle	Pepper-tree	2											+						
Senecio pterophorus	African Daisy	3		+	+	+				+	+	+			+	+		+	
Sisymbrium sp.	Wild Mustard	1										+							
Solanum nigrum	Black Nightshade					+							+						
Sonchus asper ssp.	Rough Sow-thistle	2			+														
Sonchus oleraceus	Common Sow-thistle	1													+				

Aldinga Scrub Vegetation Condition and Change Assessment

Species	Common Name	Threat	LSA	1	2	3	4	5	6	7	8	10	11	12 & 13	14	15	16	17	18
Stellaria media	Chickweed	1						+											
Stellaria sp.	Starwort	1						+	+										
Symphyotrichum subulatum	Aster-weed				+	+													
Taraxacum khatoonae	Dandelion	1													+				
Trifolium arvense var. arvense	Hare's-foot Clover	2		+		+							+						
Vicia sativa ssp. sativa	Common Vetch	2																	+
Vicia sp.	Vetch	2				+						+							
Vulpia bromoides	Squirrel-tail Fescue										+								
Vulpia sp.	Fescue	2		+		+		+		+	+	+			+				+
Yucca gloriosa	Yucca												+						
Zaluzianskya divaricata	Spreading Night-phlox	1		+		+		+	+	+	+	+	+	+	+	+	+	+	

*LSA = Declared under Landscape SA (2019); threat rating for the Southern Mt Lofty Ranges (1 = lowest threat to 5 = highest threat)

APPENDIX 4: LIST OF FAUNA RECORDED ON SITE

The following threatened fauna species have been recorded in the Biological Database of SA for the Scrub and the Scrub is considered likely to provide habitat for.

Species	Common Name	EPBC	SA	Past Record	Observed
Botaurus poiciloptilus	Australian Bittern	EN	E	Yes	
Cereopsis novaehollandiae novaehollandiae	Cape Barren Goose		R	Yes	
Coracina papuensis robusta	White-bellied Cuckooshrike		R	Yes	
Coturnix ypsilophora australis	Brown Quail		V	Yes	
Falcunculus frontatus frontatus	Eastern Shriketit		R	Yes	
Hieraaetus morphnoides	Little Eagle		V	Yes	
Himantopus leucocephalus	Pied Stilt				Yes
Melanodryas cucullata cucullata	Hooded Robin (YP, MN, AP, MLR, MM, SE)	EN	R	Yes	
Microeca fascinans fascinans	Jacky Winter (MLR, SE)		R	Yes	
Neophema elegans elegans	Elegant Parrot		R	Yes	
Pandion haliaetus cristatus	Eastern Osprey		E	yes	
Petroica boodang boodang	Scarlet Robin		R	Yes	
Stagonopleura bella samueli	Beautiful Firetail (MLR, KI)	EN		Yes	
Turnix varius varius	Painted Buttonquail		R	Yes	
Zanda funerea whiteae	Yellow-tailed Black Cockatoo		V		Yes
Trichosurus vulpecula	Common Brushtail Possum		R	Yes	

APPENDIX 5: BUSHLAND ASSSESSMENT RESULTS

Vegetation Condition Scores

SITE:	1A
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus porosa +/- E. fasciculosa open woodland over Acacia parad*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	21
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**18.0**
Number of regenerating native species	8
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**10.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Echium plantagineum	3	2	6
Arctotheca calendula	2	2	4
Senecio pterophorus	2	3	6
Asparagus asparagoides forma	2	5	10
Chrysanthemoides monilifera ssp. monilifera	1	4	4
	Cover x Threat		30
Weed Score (max 15) from benchmark community			**4**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	2
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	2
Shrubs 0.5 - 2m	3
Shrubs < 0.5	3
Forbs	2
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	
Hummock grasses	
Vines, scramblers	1
Mistletoe	2
Ferns	
Grass-tree	1
Total	19

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **16.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**0**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**3.5**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**4**
Tree Canopy Cover Score (max 5)	**4**

Vegetation Condition Score calculation

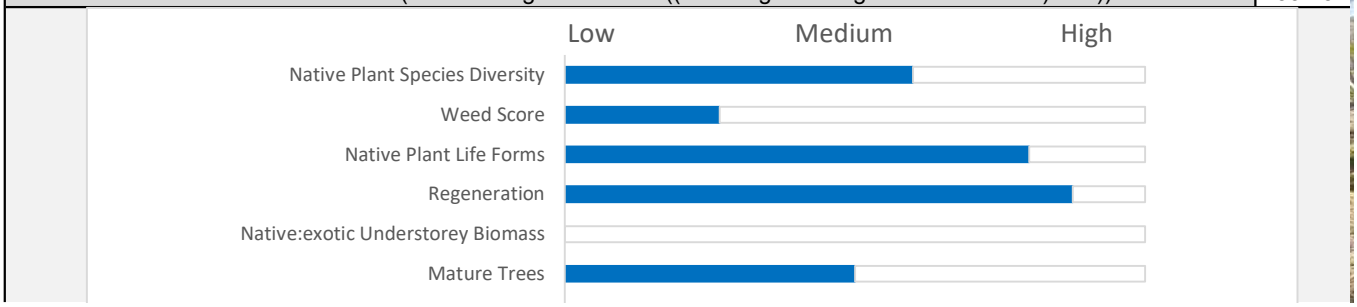
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 52.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 29.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **33.15**



Vegetation Condition Scores

SITE:	1B
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Exotic herbland*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	4
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**4.0**
Number of regenerating native species	1
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**1.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Pennisetum clandestinum	2	3	6
Ehrharta calycina	3	4	12
Echium plantagineum	4	2	8
Oxalis purpurea	4	2	8
Arctotheca calendula	4	2	8
	Cover x Threat		42
Weed Score (max 15) from benchmark community			**2**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	0
Trees < 5m	0
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	1
Shrubs < 0.5	
Forbs	
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	2
Sedges > 1m	
Sedges < 1m	
Hummock grasses	
Vines, scramblers	1
Mistletoe	
Ferns	
Grass-tree	
Total	5

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **2.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**0**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**0**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**0**
Tree Canopy Cover Score (max 5)	**0**

Vegetation Condition Score calculation

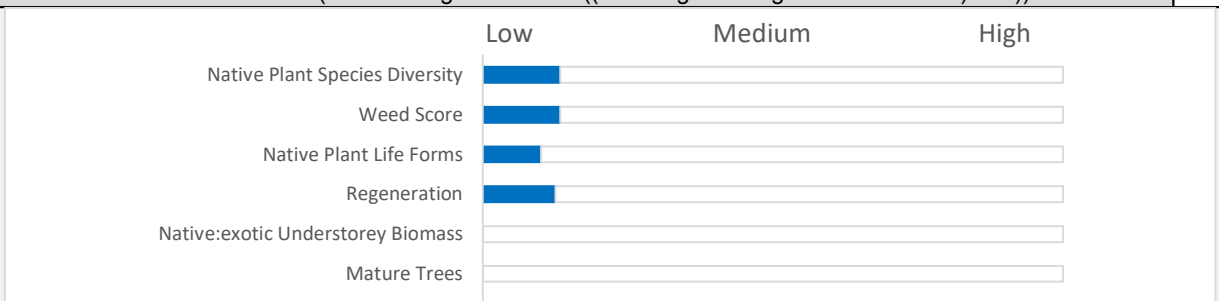
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 7.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 63.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **1.59**



Vegetation Condition Scores

SITE:	1c
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata +/- Eucalyptus porosa, +/- E. fasciculosa low c*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	32
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**24.0**
Number of regenerating native species	3
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**4.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Asparagus asparagoides forma	2	5	10
Arctotheca calendula	2	2	4
Ehrharta calycina	1	4	4
Oxalis pes-caprae	1	4	4
Chrysanthemoides monilifera ssp. monilifera	1	4	4
	Cover x Threat		26
Weed Score (max 15) from benchmark community			**6**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	1
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	3
Shrubs < 0.5	
Forbs	1
Mat Plants	2
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	2
Hummock grasses	
Vines, scramblers	2
Mistletoe	1
Ferns	3
Grass-tree	
Total	19

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **16.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

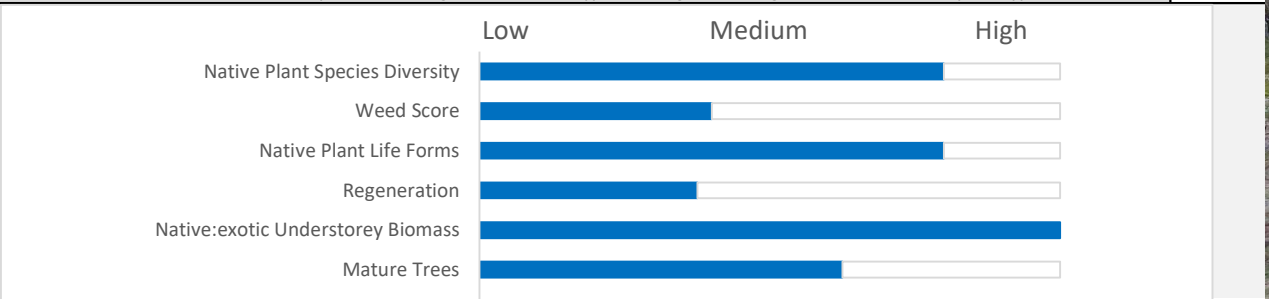
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**3.5**
Hollow-bearing trees Score (max 5)	**1**
Mature Tree Score (max 8)	**5**
Tree Canopy Cover Score (max 5)	**3**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 54.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 11.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **46.58**



Vegetation Condition Scores

SITE:	2
BCM COMMUNITY	SMLR 5.3 Deep Channel with Red Gum Woodland
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus camaldulensis* forest over *Juncus pallidus* and *Typha domi*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	12
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**16.0**
Number of regenerating native species	2
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**4.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Oxalis pes-caprae	1	4	4
Olea europaea ssp.	1	4	4
Rosa canina	1	3	3
Asparagus asparagoides forma	1	5	5
Senecio pterophorus	1	3	3
	Cover x Threat		19
Weed Score (max 15) from benchmark community			**10**

Native Plant Life Forms	**Cover rating**
Trees > 15m	2
Trees 5 - 15 m	5
Trees < 5m	2
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	
Shrubs 0.5 - 2m	2
Shrubs < 0.5	
Forbs	1
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	2
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	
Grass-tree	
Total	17
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**16.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

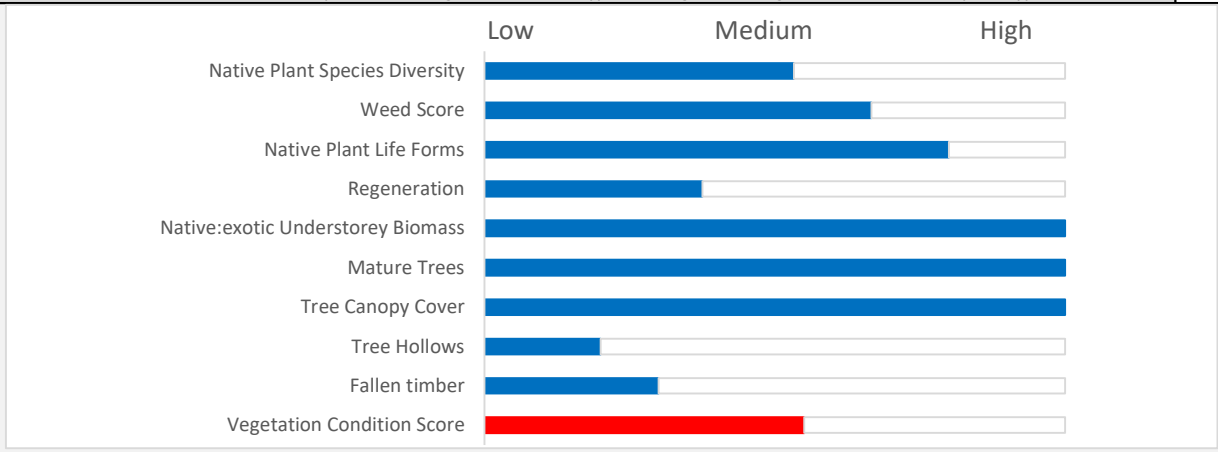
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**1.5**
Hollow-bearing trees Score (max 5)	**1**
Mature Tree Score (max 8)	**8**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 47.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 5.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **44.06**



Vegetation Condition Scores

SITE:	3
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus fasciculosa +/- Allocasuarina verticillata, E. porosa woodlan*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	25
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**20.0**
Number of regenerating native species	3
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**4.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Arctotheca calendula	3	2	6
Oxalis pes-caprae	3	4	12
Asparagus asparagoides forma	1	5	5
Ehrharta calycina	1	4	4
Echium plantagineum	3	2	6
	Cover x Threat		33
Weed Score (max 15) from benchmark community			**4**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	1
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	2
Shrubs < 0.5	1
Forbs	2
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	2
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	
Mistletoe	3
Ferns	
Grass-tree	
Total	16

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **12.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**1**

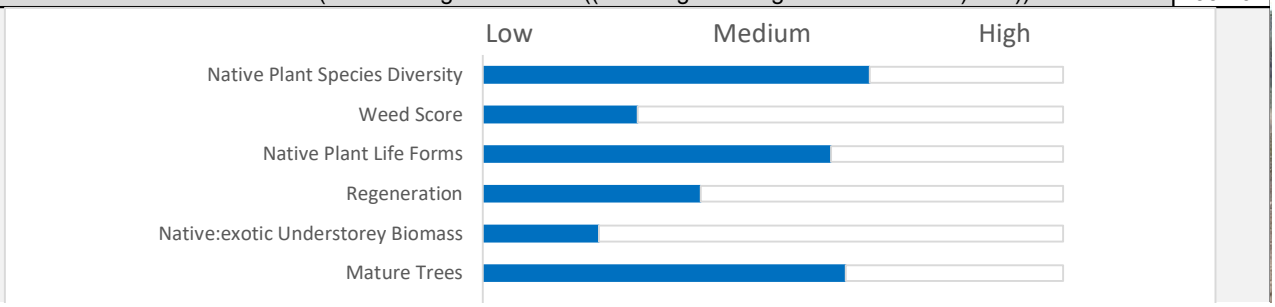
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**5**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 46.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 19.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **35.46**



Vegetation Condition Scores

SITE:	4
BCM COMMUNITY	SMLR Co 7.2 Coastal Shrublands & Tall Shrublands
VEGETATION ASSOCIATION DESCRIPTION	*Acacia longifolia ssp. sophorae, +/- Allocasuarina verticillata, +/- Olearia*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	41
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**30.0**
Number of regenerating native species	8
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**12**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	1	4	4
Ehrharta villosa var. maxima	1	4	4
Lycium ferocissimum	1	3	3
Asparagus asparagoides forma	1	5	5
Leptospermum laevigatum	1	4	4
	Cover x Threat		20
Weed Score (max 15) from benchmark community			**6**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	2
Trees < 5m	3
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	2
Shrubs 0.5 - 2m	4
Shrubs < 0.5	2
Forbs	1
Mat Plants	3
Grasses > 0.2m	1
Grasses < 0.2m	2
Sedges > 1m	
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	
Total	24
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**20.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

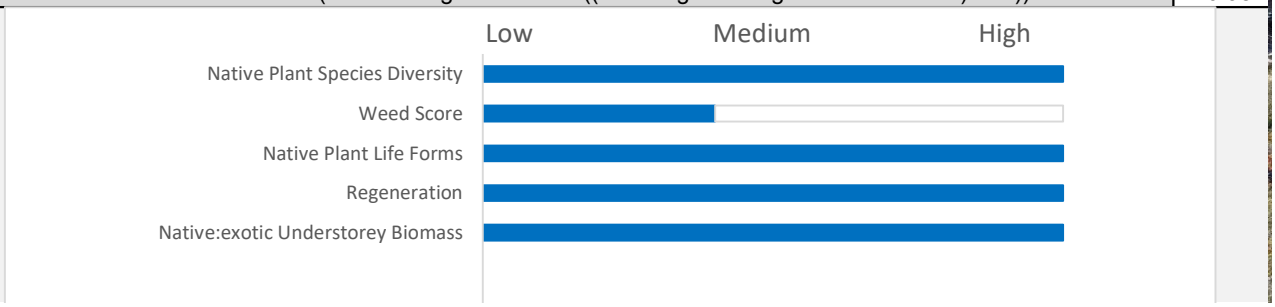
Is the community naturally treeless?	☑
Tree attributes not scored for treeless	~~3.5~~
communities or communities with only	~~0~~
emergent trees	~~4~~
	~~4~~

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 79.98

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - (Biomass score x 2))exp2/2) 9.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **70.98**



Vegetation Condition Scores

SITE:	5
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata +/- Eucalyptus fasciculosa low woodland over*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	59
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**30.0**
Number of regenerating native species	10
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**12**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Ehrharta calycina	1	4	4
Oxalis pes-caprae	1	4	4
Rhamnus alaternus	1	3	3
Leptospermum laevigatum	1	3	3
	Cover x Threat		18
Weed Score (max 15) from benchmark community			**8**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	4
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	4
Shrubs < 0.5	3
Forbs	2
Mat Plants	3
Grasses > 0.2m	1
Grasses < 0.2m	1
Sedges > 1m	1
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	1
Total	28
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**20.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

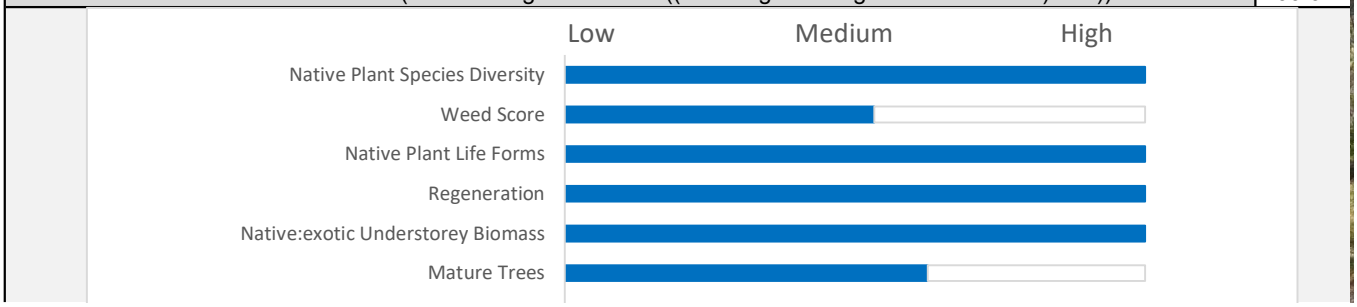
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**1**
Mature Tree Score (max 8)	**5**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 — 73.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) — 7.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) — **66.61**



Vegetation Condition Scores

SITE:	6
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata +/- Eucalyptus fasciculosa low woodland over*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	54
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**30.0**
Number of regenerating native species	14
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**12**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Asparagus asparagoides forma	1	5	5
Ehrharta calycina	2	4	8
Hypochaeris glabra	1	1	1
Arctotheca calendula	1	2	2
Briza maxima	2	2	4
	Cover x Threat		20
Weed Score (max 15) from benchmark community			**7**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	4
Trees < 5m	3
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	4
Shrubs < 0.5	4
Forbs	1
Mat Plants	3
Grasses > 0.2m	1
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	2
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	1
Total	28

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **20.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

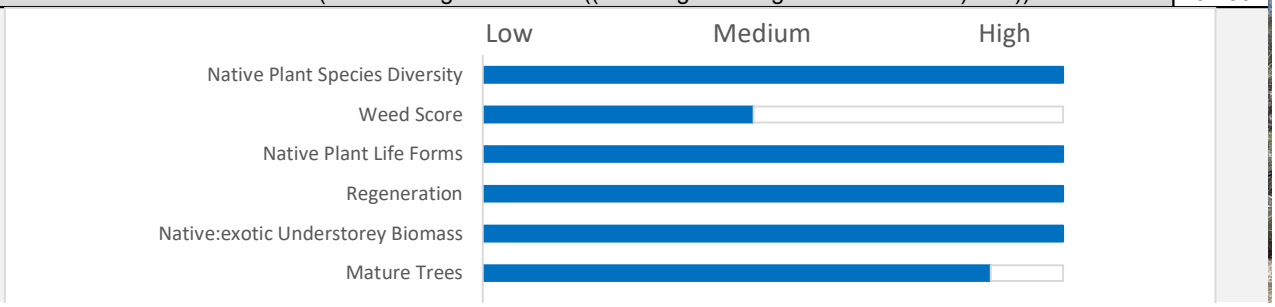
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**1**
Mature Tree Score (max 8)	**7**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 75.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 8.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **67.50**



Vegetation Condition Scores

SITE:	7
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata +/- Eucalyptus fasciculosa woodland over Xan*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	55
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**30.0**
Number of regenerating native species	11
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**12**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Asparagus asparagoides forma	1	5	5
Ehrharta calycina	1	4	4
Arctotheca calendula	1	2	2
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Briza maxima	1	2	2
	Cover x Threat		17
Weed Score (max 15) from benchmark community			**9**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	3
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	3
Shrubs < 0.5	3
Forbs	2
Mat Plants	2
Grasses > 0.2m	
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	3
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	3
Total	27

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **20.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**2**
Mature Tree Score (max 8)	**7**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

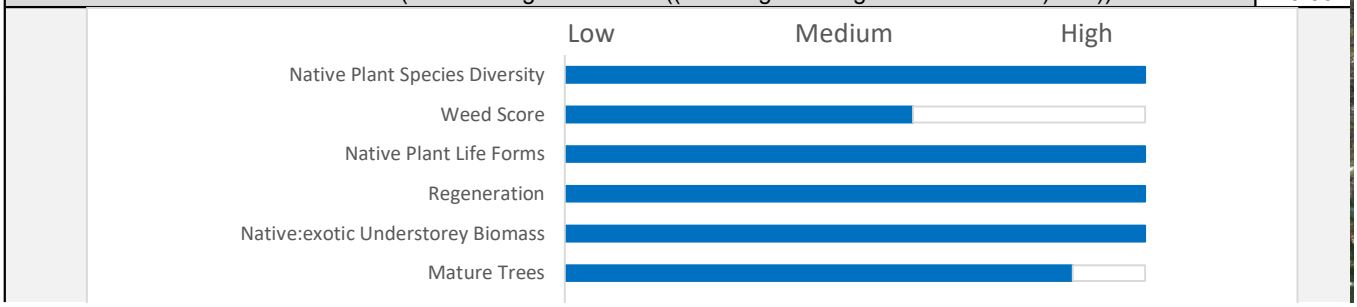
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 76.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 6.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **70.30**



Vegetation Condition Scores

SITE:	8
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus fasciculosa +/- Allocasuarina verticillata woodland over Caly*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	42
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**26.0**
Number of regenerating native species	5
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**7.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Asparagus asparagoides forma	1	5	5
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Ehrharta calycina	1	4	4
Arctotheca calendula	1	2	2
Briza maxima	1	2	2
	Cover x Threat		17
Weed Score (max 15) from benchmark community			**9**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	3
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	
Shrubs 0.5 - 2m	2
Shrubs < 0.5	3
Forbs	1
Mat Plants	2
Grasses > 0.2m	
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	3
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	2
Total	23

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **18.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**2**
Mature Tree Score (max 8)	**8**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

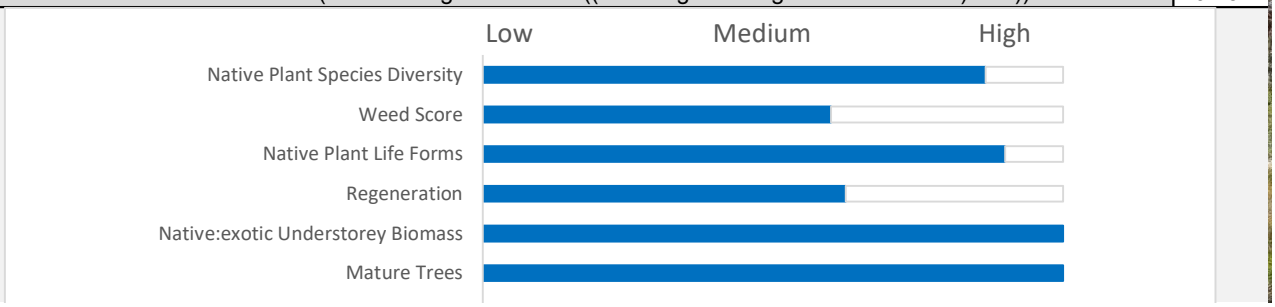
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 66.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 6.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **61.51**



Vegetation Condition Scores

SITE:	10
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus fasciculosa woodland over Acacia pycnantha Rhagodia can*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	28
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**22.0**
Number of regenerating native species	1
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**1.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	3	4	12
Asparagus asparagoides forma	1	5	5
Acacia longifolia ssp. longifolia	1	3	3
Oxalis pes-caprae	1	4	4
Senecio pterophorus	1	3	3
	Cover x Threat		27
Weed Score (max 15) from benchmark community			**5**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	2
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	2
Shrubs 0.5 - 2m	3
Shrubs < 0.5	2
Forbs	1
Mat Plants	3
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	
Hummock grasses	
Vines, scramblers	1
Mistletoe	2
Ferns	1
Grass-tree	
Total	20
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**16.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**4**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**1**
Mature Tree Score (max 8)	**5**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

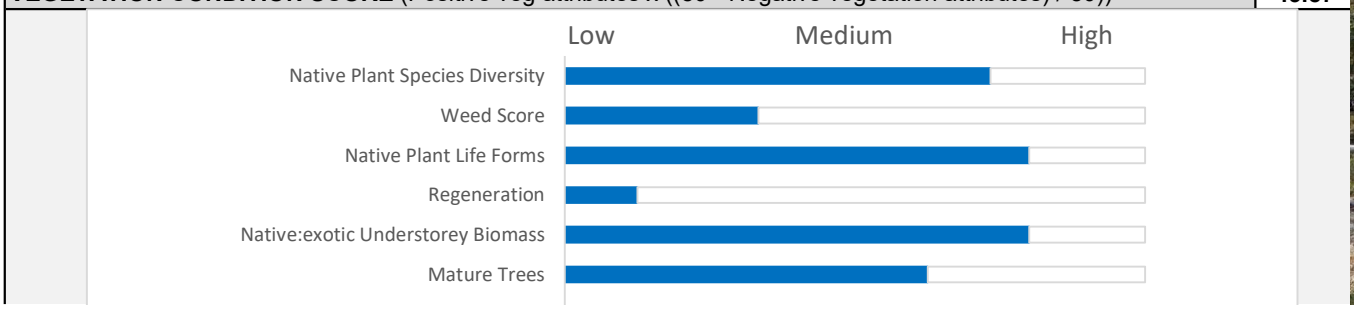
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 50.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 10.50

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **43.87**



Vegetation Condition Scores

SITE:	11
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Non-local Eucalypus spp. and Melaleuca spp. over exotic grasses and*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	15
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**12.0**
Number of regenerating native species	2
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**3**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	2	4	8
Ehrharta longiflora	2	2	4
Medicago spp.	3	2	6
Olea europaea ssp.	1	4	4
Asparagus asparagoides forma	1	5	5
	Cover x Threat		27
Weed Score (max 15) from benchmark community			**5**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	1
Trees < 5m	1
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	
Shrubs 0.5 - 2m	2
Shrubs < 0.5	2
Forbs	
Mat Plants	1
Grasses > 0.2m	
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	
Hummock grasses	
Vines, scramblers	
Mistletoe	1
Ferns	
Grass-tree	
Total	9
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**8.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**0**

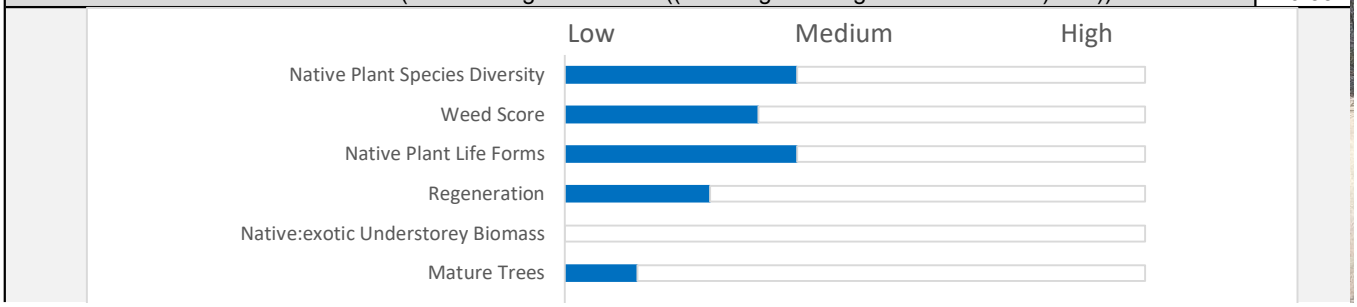
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**4**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**1**
Tree Canopy Cover Score (max 5)	**1**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 28.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 50.50

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **10.33**



Vegetation Condition Scores

SITE:	13
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata, +/- Eucalyptus fasciculosa low open woodland*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	36
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**24.0**
Number of regenerating native species	9
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**12**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	2	4	8
Asparagus asparagoides forma	1	5	5
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Scabiosa atropurpurea	1	3	3
Asphodelus fistulosus	1	2	2
	Cover x Threat		22
Weed Score (max 15) from benchmark community			**7**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	2
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	3
Shrubs < 0.5	1
Forbs	1
Mat Plants	1
Grasses > 0.2m	
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	2
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	
Grass-tree	1
Total	18
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**14.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**4**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**4**
Tree Canopy Cover Score (max 5)	**4**

Vegetation Condition Score calculation

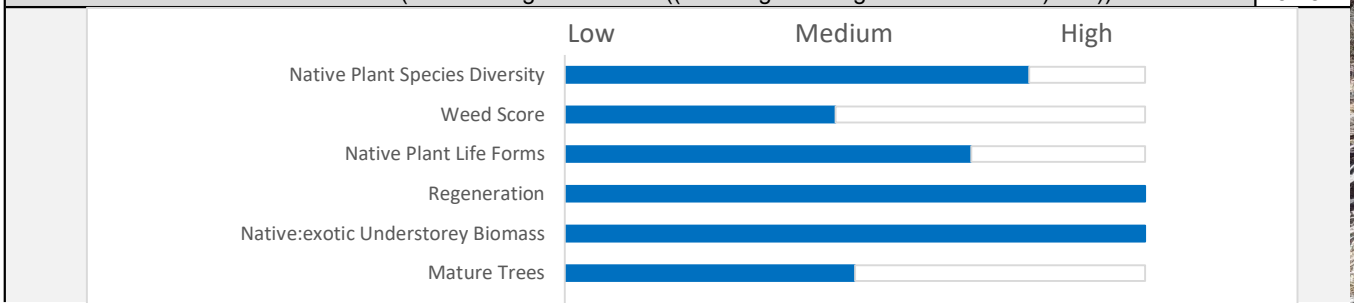
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 58.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 8.50

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **51.84**



Vegetation Condition Scores

SITE:	14
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus fasciculosa +/- Allocasuarina verticillata woodland over A. p*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	29
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**22.0**
Number of regenerating native species	2
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**3**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	2	4	8
Asparagus asparagoides forma	1	5	5
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Briza maxima	2	2	4
Medicago spp.	1	2	2
	Cover x Threat		23
Weed Score (max 15) from benchmark community			**6**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	2
Trees < 5m	1
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	3
Shrubs 0.5 - 2m	4
Shrubs < 0.5	1
Forbs	1
Mat Plants	2
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	1
Mistletoe	2
Ferns	1
Grass-tree	
Total	19

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **16.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**3**

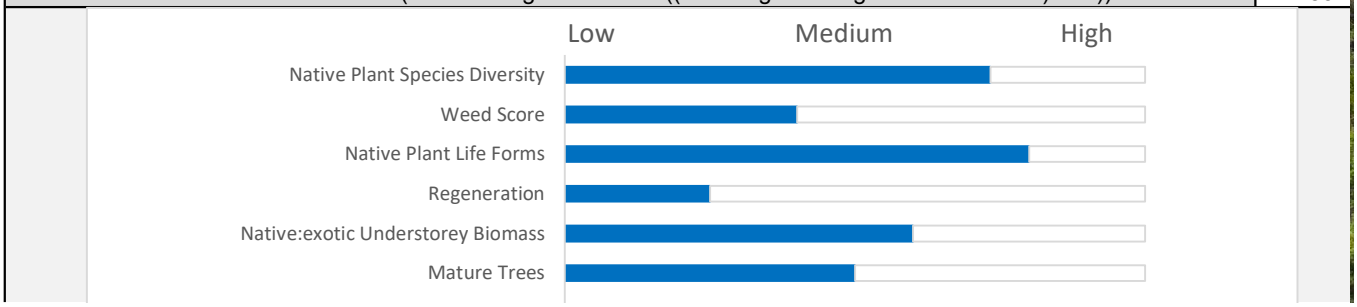
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**5**
Hollow-bearing trees Score (max 5)	**2**
Mature Tree Score (max 8)	**4**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 52.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 11.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **44.85**



Vegetation Condition Scores

SITE:	15
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Eucalyptus fasciculosa +/- Allocasuarina verticillata low open woodland*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	40
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**26.0**
Number of regenerating native species	4
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**6**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Asparagus asparagoides forma	1	5	5
Ehrharta calycina	1	4	4
Senecio pterophorus	1	3	3
Acacia saligna	1	2	2
	Cover x Threat		18
Weed Score (max 15) from benchmark community			**8**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	3
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	3
Shrubs < 0.5	2
Forbs	1
Mat Plants	1
Grasses > 0.2m	1
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	3
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	
Total	22

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **18.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**4**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**6**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

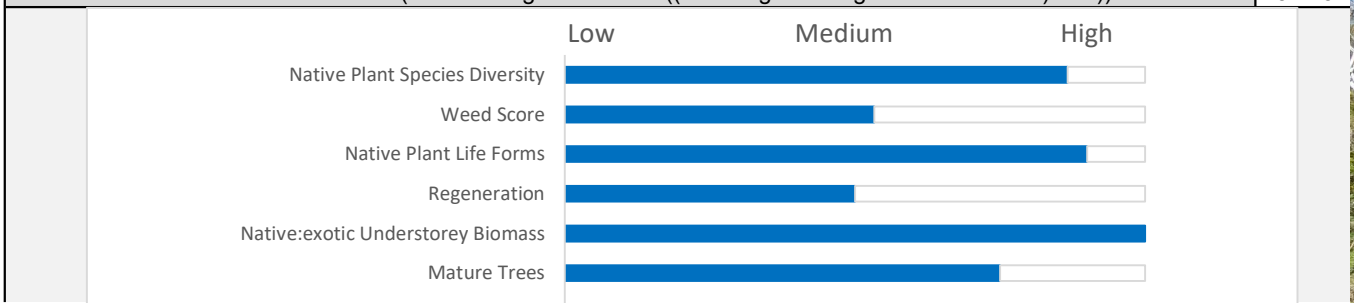
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 60.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 7.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **54.75**



Vegetation Condition Scores

SITE:	16
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata +/- Eucayptus fasciculosa low open woodland*
SIZE OF SITE (Ha)	

Benchmarked attributes
(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	40
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**26.0**
Number of regenerating native species	8
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**10.5**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	2	4	8
Zaluzianskya divaricata	2	1	2
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Asparagus asparagoides forma	1	5	5
Galenia pubescens var. pubescens	1	2	2
	Cover x Threat		21
Weed Score (max 15) from benchmark community			**7**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	3
Mallee > 5m	1
Mallee < 5m	
Shrubs > 2m	3
Shrubs 0.5 - 2m	4
Shrubs < 0.5	1
Forbs	1
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	1
Sedges > 1m	
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	1
Mistletoe	1
Ferns	1
Grass-tree	
Total	21
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**16.0**

Non-Benchmarked Attributes
(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**5**

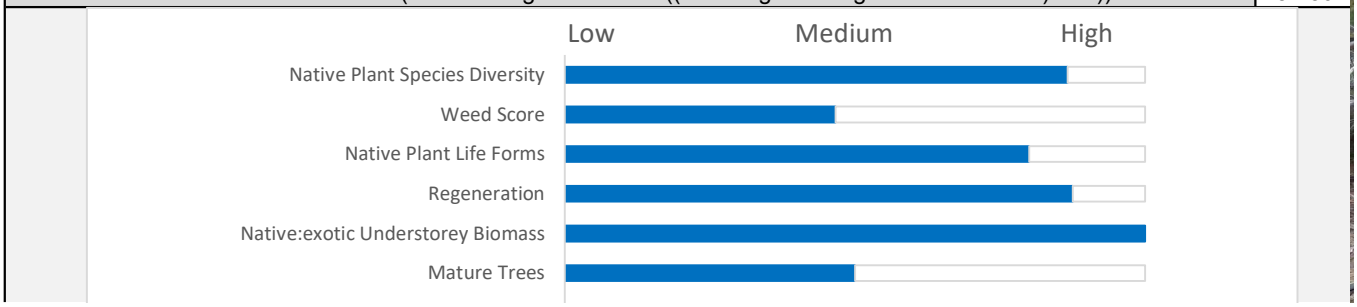
Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**3.5**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**4**
Tree Canopy Cover Score (max 5)	**3**

Vegetation Condition Score calculation

Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24
- If the community is naturally treeless this score is multiplied by 1.29 60.00

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 10.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **52.50**



Vegetation Condition Scores

SITE:	17
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Allocasuarina verticillata, +/- Eucalyptus fasciculosa woodland over Leu*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	20
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**16.0**
Number of regenerating native species	2
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**3**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	5	4	20
Lagurus ovatus	2	2	4
Olea europaea ssp.	1	4	4
Chrysanthemoides monilifera ssp. monilifera	1	4	4
Asparagus asparagoides forma	1	5	5
	Cover x Threat		37
Weed Score (max 15) from benchmark community			**3**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	3
Trees < 5m	2
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	3
Shrubs 0.5 - 2m	3
Shrubs < 0.5	1
Forbs	1
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	1
Hummock grasses	
Vines, scramblers	2
Mistletoe	2
Ferns	3
Grass-tree	1
Total	22
Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2*	**18.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**3**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**4.5**
Hollow-bearing trees Score (max 5)	**4**
Mature Tree Score (max 8)	**5**
Tree Canopy Cover Score (max 5)	**5**

Vegetation Condition Score calculation

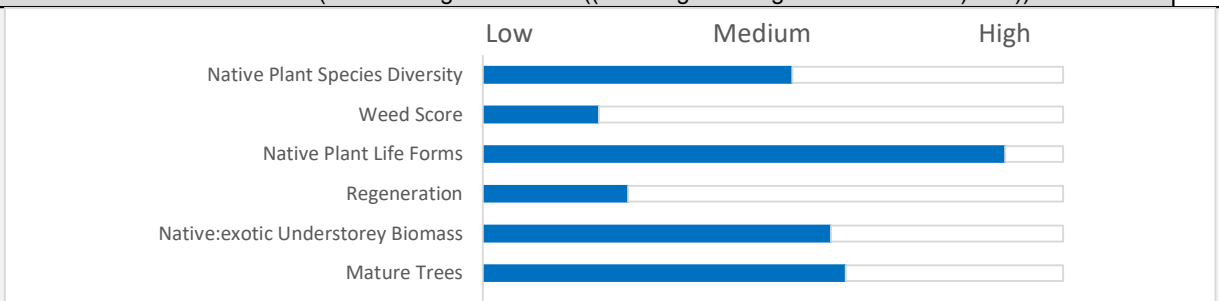
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 50.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 14.00

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **41.66**



Vegetation Condition Scores

SITE:	18
BCM COMMUNITY	SMLR 2 Forests and Woodlands with an Open Sclerophyll Shrub Understorey
VEGETATION ASSOCIATION DESCRIPTION	*Pteridium esculentum , +/- Ehrharta calycina fernland grading to Cyperu*
SIZE OF SITE (Ha)	

Benchmarked attributes

(Scores determined by comparing to a Benchmark community)

Number of Native Species (Minus herbaceous annuals for spring Surveys)	15
Native Plant Species Diversity Score (max 30) from benchmark score *weighted by a factor of 2*	**12.0**
Number of regenerating native species	0
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5	**0**

Weed species (Top 5 Cover x Invasiveness)	Cover (max 6)	Weed Threat Rating (max 5)	C x I
Ehrharta calycina	5	4	20
Arctotheca calendula	2	2	4
Echium plantagineum	1	2	2
Lagurus ovatus	2	2	4
Galenia pubescens var. pubescens	1	2	2
	Cover x Threat		32
Weed Score (max 15) from benchmark community			**4**

Native Plant Life Forms	**Cover rating**
Trees > 15m	
Trees 5 - 15 m	1
Trees < 5m	
Mallee > 5m	
Mallee < 5m	
Shrubs > 2m	1
Shrubs 0.5 - 2m	1
Shrubs < 0.5	
Forbs	
Mat Plants	
Grasses > 0.2m	
Grasses < 0.2m	
Sedges > 1m	
Sedges < 1m	2
Hummock grasses	
Vines, scramblers	
Mistletoe	
Ferns	4
Grass-tree	
Total	9

Native Plant Life Forms (max 20) from benchmark score *weighted by a factor of 2* **8.0**

Non-Benchmarked Attributes

(Scores determined from direct field observations)

Native:exotic Understorey biomass Score (max 5)	**1**

Is the community naturally treeless?	☐
Fallen Timber/Debris (max 5)	**0.5**
Hollow-bearing trees Score (max 5)	**0**
Mature Tree Score (max 8)	**2**
Tree Canopy Cover Score (max 5)	**0**

Vegetation Condition Score calculation

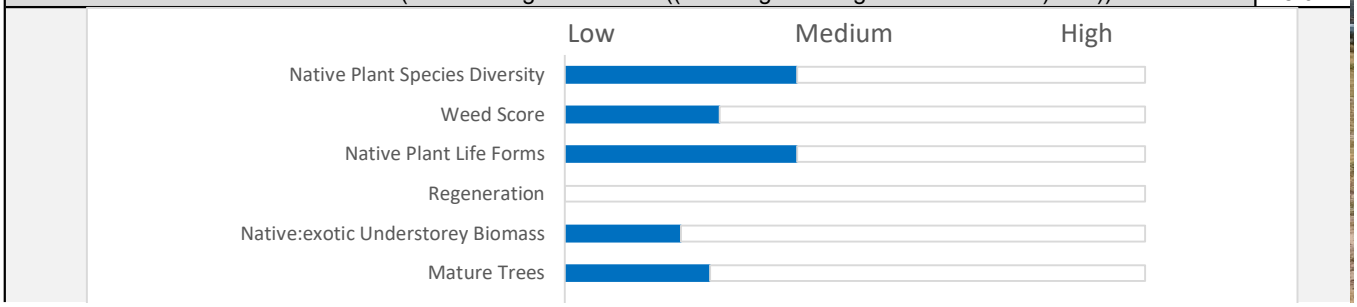
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms
Fallen timber/debris + Hollow-bearing trees

- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24

- If the community is naturally treeless this score is multiplied by 1.29 22.50

Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2) 51.50

VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80)) **8.02**



ATTACHMENTS

1. Document review (Excel spreadsheet)
2. Shapefiles:
    a. Location of monitoring sites
    b. Extent and description of Management Units
3. BAM Excel spreadsheets