Wakefield Regional Council

Selective survey of Council-managed Reserves

Surveyed by Sonia Croft and Tim Croft 14-16th August 2023

For the Wakefield Regional Council and

the Northern and Yorke Landscape Board

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METHODS

Seven Road Reserves, a Water Reserve and two cemetery reserves were surveyed by Sonia Croft and Tim Croft, 14th to 16th August 2023 at the request of the Wakefield Regional Council and the Northern and Yorke Landscape Board. The reserves were surveyed using the Bushland Assessment Method (Native Vegetation Council, 2020). The Bushland Assessment method provides a single vegetation condition score as well as scores for various condition attributes, including plant species diversity, weed abundance and threat, mature tree cover and condition, and plant structural integrity. A complete list of native and exotic species recorded during the survey is provided. For each road reserve, a separate Bushland Assessment was conducted for each distinct vegetation association (same dominant overstorey species). In some cases, vegetation associations were further defined on the basis of bushland condition. These vegetation associations have also been mapped using QGIS software.

in addition to a Bushland Assessment, this report provides a summary of each reserve's key conservation assets and recommended conservation actions.

For each reserve, plants of regional or State conservation are identified (where present). All sites occur with the St Vincent IBRA subregion. Conservation ratings for this IBRA sub-region have been obtained from NatureMaps SA (2023).

Explanation of Bushland Assessment Scores reported for each Reserve

Weed Threat Score – the lower the score the higher the weed threat

Structural Layer Score – the higher the score the greater the cover and/or number of plant life forms

Mature Score – based on the health and percentage of mature trees remaining

Native: Exotic biomass – the percentage of total plant biomass (for plants up to 2 m high) that is native

BOWILLIA UNMADE ROAD RESERVE

Vegetation Associations

1: *Eucalyptus gracilis* +/- *Eucalyptus brachycalyx* +/- *Eucalyptus dumosa* Open Mallee

2. *Austrostipa* grassland – Acacia ligulata shrubland

3. *Eucalyptus oleosa* - *Eucalyptus gracilis* – *Eucalyptus phenax* Open Mallee

4. *Eucalyptus incrassata* – *Eucalyptus socialis* Open Mallee

5. *Eucalyptus gracilis* Open Mallee including *Melaleuca pauperiflora*

Length surveyed: 2100 m

Bushland Assessment Scores

Veg Assoc	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Length (m)
1	15	2	12	5	4	31	380
2	12	4	15	0	3	12	150
3	10	2	14	6	3	28	690
4	9	3	12	6	3	26	550
5	8	4	12	6	4	28	430

N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%



Figure 1: Location of Vegetation Associations, Bowillia Road

Key Conservation Assets

Retains old growth mallee with numerous large and small hollows

28 native species recorded

6 species with a regional conservation rating

Key Conservation Management Actions

Control of isolated Boxthorn (supplementing existing control)

Trial spraying of dense Soursob, *Oxalis pes-caprae* (where natives are absent)

Control of Horehound and Artichoke thistle

Planting of Native Pine, *Callitris gracilis,* in Associations 2 and 4

Rabbit warren destruction

Adjoining Land Use: Cropped both sides, and partially adjoins revegetation.

Fencing and Infrastructure: Fenced on the entire eastern boundary. Fenced on the northern half of the western boundary (southern half of western boundary unfenced). Gate at southern end

Vegetation Description:

1: *Eucalyptus gracilis* (Yorrell) +/- *Eucalyptus brachycalyx* (Gilja) +/- *Eucalyptus dumosa* (White Mallee) Open Mallee on sandy loams of gentle slopes.

Widely spaced mallees, 8 – 10 m tall of reduced natural density

The chenopod shrubs, *Enchylaena tomentosa* (Ruby Saltbush) and *Maireana brevifolia* (Short-leaf Bluebush) were prominent in the very open understsorey.

Ground cover dominated by Soursob, *Oxalis pes-caprae* at the time of survey

Eucalyptus socialis (Red Mallee) occasionally occurred and is rated Rare for the St Vincent region.



Photo 1: Bowillia Road Vegetation type 1: Eucalyptus gracilis Open Mallee over largely exotic herbs ad grasses.

2. *Austrostipa* (Spear-grass) grassland – *Acacia ligulata* (Umbrella Wattle) shrubland ON low dune of red/orange sand.

A treeless area, now dominated by native and exotic groundcovers, and a patch of *Acacia ligulata*.

This area is thought likely to have supported Native Pines, *Callitris gracilis* prior to European settlement.



Photo 2: Bowillia Road Vegetation type 2: Austrostipa grassland. Possibly formerly Callitris gracilis Low Woodland.

3. *Eucalyptus oleosa* (Acorn Mallee) - *Eucalyptus gracilis* (Yorrell) – *Eucalyptus phenax* (Sessile-fruit Mallee) Open Mallee on lower dunes with sandy soil

The mallee trees are tall old mallees with numerous hollows, but are of reduced natural density. The very open understorey contains sparsely scattered native shrubs and groundcovers but at the time of survey Soursob formed largely a dense groundcover.



Photo 3: Bowillia Road Vegetation type 3: Austrostipa grassland. Possibly formerly Callitris gracilis Low Woodland.

4. *Eucalyptus incrassata* (Ridge-fruited Mallee) – *Eucalyptus socialis* (Red Mallee) Open Mallee on tallest dunes of red sand

As occurs elsewhere on the Road Reserve, the mallee trees are tall old mallees with numerous hollows, but are of reduced natural density. Within the St Vincent region, taller dunes are highly restricted and hence Ridge-fruited Mallee is considered Rare for this region.



Photo 4: Bowillia Road Vegetation type 4: Eucalyptus incrassata – E. socialis mallee on a taller dune

5. *Eucalyptus gracilis* (Yorrell) Open Mallee including *Melaleuca pauperiflora* (Borree) on gentle slopes with surface calcrete rubble

This association was distinguished by the presence of surface calcrete. Associated with these limestone soils (and not occurring elsewhere on the road reserve) were several trees of Borree, *Melaleuca pauperiflora* and several plants of the native groundcover, Grey Bindyi, *Sclerolaena diacantha*. Borree is rated Vulnerable for the St Vincent region.



Photo 5: Bowillia Road. Vegetation type 5: Eucalyptus gracilis over Melaleuca pauperiflora

Native plant Species recorded 14/8/2023

Scientific name	Common name	Vegetation Type & species cover/abundance*					Regional rating**
		1	2	3	4	5	
Acacia ligulata	Umbrella Bush	1	3	3			
Aristida behriana	Brush Wire-grass		2				
Austrostipa sp.	Spear-grass	2	3	2	2		
Callitris gracilis	Southern Cypress Pine				1		NT
Convolvulus angustissimus	Narrow-leaf Bindweed		2				
Crassula colligata ssp.	Stonecrop				1a		
Enchylaena tomentosa var.	Ruby Saltbush	3	2	3	3	3	
Enneapogon nigricans	Nine-awn grass	2					
Enteropogon acicularis	Umbrella Grass		1				
Eucalyptus brachycalyx	Gilja	1					
Eucalyptus dumosa	White Mallee	1					
Eucalyptus gracilis	Yorrell	2		2	1	3	
Eucalyptus incrassata	Ridge-fruited Mallee				3		R
Eucalyptus oleosa ssp.	Acorn Mallee			3			
Eucalyptus phenax ssp.	Sessile-fruit Mallee	2		3	1		
Eucalyptus socialis ssp.	Beaked Red Mallee	1		1	3		R
Maireana brevifolia	Short-leaf Bluebush	3	2	1		2	
Melaleuca lanceolata	Dryland Tea-tree	1					NT
Melaleuca pauperiflora ssp. mutica	Boree					2	V
Myoporum platycarpum ssp. perbellum	Mallee Sandalwood	1		1			
Nitraria billardierei	Nitre-bush	1					
Rhagodia preissii ssp. preissii	Mallee Saltbush					1	
Rhagodia spinescens	Spiny Saltbush	1				1	
Rytidosperma sp.	Wallaby-grass		2				
Salsola australis	Buckbush	2	2	2	2	1	
Sclerolaena diacantha	Grey Bindyi					3	
Solanum esuriale	Quena		1				R
Teucrium racemosum	Grey Germander	1a					
Vittadinia gracilis	Woolly New Holland Daisy		1				
TOTALS		22	21	21	16	16	

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

**NT = Near Threatened; R = Rare; V = Vulnerable

Introduced plant Species recorded 14/8/2023

Scientific name	Common name	Vegetation Type & species cover/abundance*				
		1	2	3	4	5
Asphodelus fistulosus	Onion Weed	1	1			
Avena barbata	Bearded Oat	2	5		3	1a
Bromus diandrus	Great Brome	2	2	1	1a	
Carrichtera annua	Ward's Weed		1a			2
Carthamus lanatus	Saffron Thistle		2			
Conyza sp.	Fleabane		1			
Cynara cardunculus ssp. flavescens	Artichoke Thistle		1			
Euphorbia terracina	False Caper	1	1		1	
Hordeum sp.	Barley-grass	1a			1	
Lolium sp.	Ryegrass					1
Lycium ferocissimum	African Boxthorn	1	1			1
Marrubium vulgare	Horehound	1a	2			
Mesembryanthemum crystallinum	Common Iceplant	2				2
Oxalis pes-caprae	Soursob	5	3	6	5	2
Romulea sp.	Onion-grass					1a
Schismus barbatus	Arabian Grass				1	
Sisymbrium erysimoides	Smooth Mustard	1	1		1a	
Solanun nigrum	Black Nightshade			1		
Vicia sp.	Vetch		1			

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

REINKE UNMADE ROAD RESERVE

Vegetation Associations

1: *Eucalyptus odorata – Eucalyptus socialis* Mallee

2: *Eremophila longifolia* tall shrubland

3: *Rytidosperma* sp. – *Austrostipa* sp. Open Grassland

4: *Eucalyptus phenax* Mallee

Length: Total length = 1940 m

Bushland Assessment Scores

Veg Assoc	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Length (m)
1	15	4	16	4	1	28	320
2	2	5	4	Not applic	2	5	110
3	6	4	8	0	3	9	1465
4	9	10	12	6	3	27	45

***N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%**



Figure 2: Location of Vegetation Associations, Reinke Road

Key Conservation Assets

21 native species recorded

1 species with a State conservation rating and an additional 3 species with a regional (St Vincent) conservation rating

Retains areas with a high cover of native grasses and other native groundcovers.

Key Conservation Management Actions

Manage grazing pressure to encourage natural regeneration.

Adjoining Land Use: Cropped both sides

Fencing and Infrastructure: The road reserve is fenced on the southern boundary only. The road is an open road (sign-posted at the eastern end) with a vehicle track traversing the length.

Vegetation Description:

1: *Eucalyptus odorata,* Peppermint Box – *Eucalyptus sociali,s* Red Mallee Mallee

Peppermint Box and Red Malee occupy the western 300 m of the Road Reserve. The open understorey is dominated by exotic herbs and grasses, particularly Soursob and Barley grasses. Native shrubs were very sparse. All native plants have been heavily grazed, with shrubs and trees having a distinct browse line.

Both Peppermint Box and Red Mallee are rated Rare for the St Vincent region. One plant of Rohrlach's Bluebush was recorded in this association, this species is rated Rare for South Australia.



Photo 6: Reinke Road. Vegetation Type 1: Eucalyptus odorata Woodland at western end of Road Reserve over a largely exotic understorey. From Easting 267945 Northing 6231240. Bearing 70 degrees.

2: *Eremophila longifolia* Weeping Emubush tall shrubland

Two dense patches of Weeping Emubush occupy a total of approximately 110 m within the surveyed area. The understorey was dominated by a dense cover of exotic herbs and grasses, particularly Soursob and Barley grasses. Short-leaf Bluebush, *Maireana brevifolia* was the only other native species recorded.



Photo 7: Reinke Road. Vegetation Type 2: Eremophila longifolia Woodland at western end of Road Reserve over a largely exotic understorey. From Easting 268218 Northing 6231354. Bearing 80 degrees.

3: *Rytidosperma* Wallaby-grass – *Austrostipa* Spear-grass Open Grassland

The majority of the road reserve has likely been cleared of at least shrubs and is grazed and mown. Native groundcover is highly variable, but extensive areas, particularly in the eastern half retain a high cover of native grasses. Native plants up to 50% biomass in some areas, and averaged approximately 20% of total biomass in the eastern half of the surveyed area.

This area occurs on cracking clay loam/ loamy clay soils and because of the heavier textured soils may have always been treeless, or largely treeless. At least 6 native species were recorded. At the time of survey, the grasses were slashed to approximately 10 – 15 cm height and no flower heads were present.



Photo 8: Reinke Road. Vegetation Type 3: Austrostipa grassland. From Easting 269362 Northing 6231584. Bearing 240 degrees.

4: *Eucalyptus phenax* Sessile-fruit Mallee

Scattered trees of White Mallee occur at the eastern end, over exotic herbs and grasses and rubble.



Photo 9: Reinke Road. Vegetation Type 4: Scattered White Mallee, Eucalyptus phenax.. From Easting 267945 Northing 6231240. Bearing 70 degrees.

Native Species recorded 14/8/2023: Reinke Road

Scientific Name	Common Name	Vegetation Type & species cover/abundance*				Regional rating**
		1	2	3	4	
Acacia hakeoides	Hakea Wattle	1				
Acacia ligulata	Umbrella Bush				1	
Alectryon oleifolius ssp. canescens	Bullock Bush	2				
Austrostipa sp.	Spear-grass	2		2	1	
Convolvulus angustissimus	Narrow-leaf Bindweed			1	1	
Crassula colorata var.	Dense Crassula	1a				
Einadia nutans ssp. nutans	Climbing Saltbush	1				
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	2			2	
Eremophila longifolia	Weeping Emubush	1	4			
Erodium crinitum	Blue Heron's-bill	1a				
Eucalyptus odorata	Peppermint Box	3				R
Eucalyptus phenax ssp.	Sessile-fruit Mallee				4	
Eucalyptus socialis ssp.	Beaked Red Mallee	3				R
Maireana brevifolia	Short-leaf Bluebush	2	1			
Maireana enchylaenoides	Wingless Fissure-plant	1a		1	1	
Maireana rohrlachii	Rohrlach's Bluebush	1				V
Rytidosperma sp.	Wallaby-grass	2		3	1	
Senna artemisioides ssp. X coriacea	Broad-leaf Desert Senna				1	
Senna artemisioides ssp.	Senna	1			1	R
Teucrium racemosum	Grey Germander			1		
Vittadinia gracilis	Woolly New Holland Daisy			1		

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

**NT = Near Threatened; R = Rare; V = Vulnerable

Exotic Species: Reinke Road

Scientific Name	Common Name	Vegetation Type & species cover/abundance*			
		1	2	3	4
Arctotheca calendula	Cape Weed	1			
Avena barbata	Bearded Oat	1a	1a	1a	
Bromus diandrus	Great Brome		1a		
Hordeum sp.	Barley-grass	3	2	3	
Lepidium africanum	Common Peppercress	1a			
Lolium sp.	Ryegrass		1		
Malva parviflora	Small-flower Marshmallow	1a	1		
Medicago sp.	Medic			1a	
Oxalis pes-caprae	Soursob	4	6	2	3
Poa bulbosa	Bulbous Meadow-grass			2	
Romulea sp.	Onion-grass	1		2	
Salvia verbenaca var.	Wild Sage	1		1a	
Urtica urens	Small Nettle		1a		

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

HERDS HILL ROAD– northern side

Vegetation Associations

1: *Piptatherum miliaceum* Rice Millet, +/- *Cynodon dactylon*, Couch and/or *Enteropogon acicularis - Enneapogon nigricans* grassland

Length: Total length = 1525 m

Bushland Assessment Scores

No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Length (m)
9	6	8	Not applic	4	24	1525

***N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%**



Figure 3: Location of Herds Hill Road survey area (northern side of road surveyed)

Key Conservation Assets

9 native species recorded.

Likely to have been naturally treeless pre-European settlement.

Native grass biomass up to 50% of total biomass.

Key Conservation Management Actions

Trial spraying of dense Rice Millet *Piptatherum miliaceum* and Scabiosa, *Sixalix atropurpurea*, avoiding areas of high native cover.

Control of small patch of Fountain Grass, *Cenchrus setaceus* (< 10 plants).

Adjoining Land Use: Cropping

Fencing and Infrastructure: Fenced on the northern boundary

Vegetation Description: The area surveyed had recently been sprayed with herbicide, but plant species could still be identified. The cover of native and exotic herbs and grasses was highly variable, but the exotic Rice Millet was widespread and dominant. The native Grasses, *Enteropogon acicularis* and *Enneapogon nigricans* were also widespread and up to 25% cover locally.



Photo 10: Herds Hill Road from western end. Easting 274573 Northing 6229933. Largely sprayed out dense couch grass



Photo 11: Herds Hill Road from Easting 275480 Northing 6229835. High cover of Enneapogon nigricans and Enteropogon acicularis

Plant Species recorded 15/8/2023

Native Species

Scientific Name	Common Name	Cover*
Aristida behriana	Brush Wire-grass	2
Austrostipa sp.	Spear-grass	1
Convolvulus angustissimus	Narrow-leaf Bindweed	2
Enneapogon nigricans	Nine-awn Grass	2
Enteropogon acicularis	Umbrella Grass	3
Maireana enchylaenoides	Wingless Fissure-plant	1
Pseudognaphalium luteoalbum	Jersey Cudweed	1
Teucrium racemosum	Grey Germander	1
Vittadinia cervicularis var.	Waisted New Holland Daisy	1

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

Introduced Species

Scientific Name	Common Name	Cover*
Asphodelus fistulosus	Onion Weed	1
Avena barbata	Bearded Oat	3
Brassicacea sp.		1a
Carrichtera annua	Ward's Weed	1
Cenchrus setaceus	Fountain Grass	1
Conyza sp.	Fleabane	1a
Cymbalaria muralis	Ivy-leaf Toadflax	2
Cynodon dactylon var.	Couch	3
Galium aparine	Cleavers	1a
Hordeum sp.	Barley-grass	2
Thinopyrum elongatum	Tall Wheat-grass	1
Malva parviflora	Small-flower Marshmallow	2
Piptatherum miliaceum	Rice Millet	2
Reichardia tingitana	False Sowthistle	2
Scabiosa atropurpurea	Pincushion	3
Sherardia arvensis	Field Madder	2
Vicia sp.	Vetch	1

1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

MOUNT GEORGE ROAD – southern side

Vegetation Associations

1. *Piptatherum miliaceum*, Rice Milett – *Cynodon dactylon*, Couch Grassland
2. *Piptatherum miliaceum*, Rice Milett – *Austrostipa* sp. Spear-grass Grassland

Length surveyed: 1630 m

Bushland Assessment Scores

Vegetation type	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Length (m)
1	2	10	2	Not applic	1	3	370
2	7	8	8	Not applic	3	19	1130

***N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%**



Figure 4: Location of Vegetation Associations, Mount George Road

Key Conservation Assets

7 native species recorded.

Native groundcover is highly variable, but locally is approximately 25 – 50% .

The pre-European vegetation is likely to have been a grassland or shrubland, with trees largely absent.

Spraying seems to have decreased broad leaf exotic herbs, Wild Sage and Scabiosa.

Key Conservation Management Actions

Trial selective spraying of exotic perennial grasses, avoiding areas of high native cover.

Vegetation Description:

The majority of the road verge appears to be colonising grasses and herbs that have regrown over road rubble. The surveyed area had been sprayed recently prior to the survey, but most plants were still identifiable and/or not fully dead. An annual exotic grass was not able to be identified however.

1. *Piptatherum miliaceum,* Rice Millet – *Cynodon dactylon,* Couch Grassland

At the western end, native cover was very sparse, estimated to cover < 5%. The western 100 m is exotic cover only on rubble. Rice Millet, Maltese Thistle, Couch Grass were the dominant species.



Photo 12: Mount George Road from western end. Easting 275035 Northing 6232530,. Largely exotic grasses.

2. *Piptatherum miliaceum,* Rice Millet – *Austrostipa sp.* Spear-grass Grassland

The eastern 2/3 of the surveyed area contains a higher cover of native grasses, particularly Spear-grass, Austrostipa sp., up to 25% cover, and Nine-awn Grass, *Enneapogon nigricans* and Brush Wire-grass, *Aristida behriana,* both up to 5% cover. However, exotic herbs and grasses remain dominant, particularly Rice Millet (up to 50% cover) and Couch grass (locally dense cover) and annual grasses. At the eastern end, Kangaroo Grass, *Themeda triandra* occupies as few m^2, but largely surrounded by exotic grasses.



Photo 13: From eastern end. Easting 276555 Northing 6232580. Higher native grass cover including a few Themeda triandra.

Northern road verge of Mount George Road

The northern verge was not intensively surveyed but was noted to have been not sprayed with herbicide. IN contrast to the sprayed verge, the unsprayed verge appeared to be dominated by broad-leaf herbs, particularly Scabiosa, *Sixalix atropurpurea* and Wild Sage, *Salvia verebenca*.

Pre-European Vegetation

Within the immediately adjoining landscape, there are no remnant trees present. The trees present appear to have been planted or naturally colonised. It is thought the pre-European vegetation was likely a shrubland and/or grassland.

Adjoining Land Use: Cropping and made road.

Fencing: Fenced on northern boundary

Plant Species recorded 15/8/2023

Scientific Name	Common Name	Vegetation Type & species cover/abundance*	
		1	2
Austrostipa sp.	Spear-grass	1a to 2	2 to 3
Enneapogon nigricans	Nine-awn Grass	1a to 2	2 to 3
Vittadinia gracilis	Woolly New Holland Daisy		1
Aristida behriana	Brush Wire-grass		2
Themeda triandra	Kangaroo Grass		1
Salsola australis	Buckbush		1
Rytidosperma sp.	Wallaby-grass		1

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

Scientific Name	Common Name	Vegetation Type & species cover/abundance*	
		1	2
Piptatherum miliaceum	Rice Millet		2 to 4
Cynodon dactylon var. dactylon	Couch	3 to 4	2
Centaurea melitensis	Malta Thistle	2	2
Hordeum sp.		2	2
Malva parviflora	Small-flower Marshmallow	2	2
Salvia verbenaca var.	Wild Sage	2	2
Bromus diandrus	Great Brome	2	2
Scabiosa atropurpurea	Pincushion	2	2
Brachypodium distachyon	False Brome	2	2
Panicum capillare var. brevifolium	Witch-grass		1
Lolium sp.	Ryegrass		1
Marrubium vulgare	Horehound	1	1
Solanum elaeagnifolium	Silver-leaf Nightshade		1
Thinopyrum elongatum	Tall Wheat-grass	1	

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

HOYLETON ROAD – eastern side

Vegetation Associations

1. *Piptatherum miliaceum* grassland and sparse native grasses

2. *Acacia notabilis* – *Senna* very open shrubland either side of drainage line with patches of dense Couch grass and Kikuyu grass

3. *Enneapogon nigricans* - *Piptatherum miliaceum* - *Cynodon dactylon* grassland

Length: Total length = 2300 m

Bushland Assessment Scores

Vegetation type	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Length (m)
1	12	9	8	Not applic	1	15	1525
2	5	3	4	Not applic	1	5	175
3	5	8	4	Not applic	1	8	380

N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%



Figure 5: Location of Vegetation Associations, Hoyleton Road, eastern side

Key Conservation Assets

15 native species recorded.

Native cover and biomass was highly variable, but native biomass was estimated to average 5 – 10% of total biomass.

The area is highly modified but was likely to have always been largely treeless - –and possibly *Lomandra* grassland prior to European settlement.

Key Conservation management actions

Trial the reduction or ceasing of spraying in areas of higher native cover and/or

Continue spraying regime targeting Rice Millet, Maltese Thistle and Couch Grass, but avoiding areas of higher native cover.

Adjoining Land Use: Cropping and made road.

Fencing: Fenced on cropping boundary.

Vegetation Description:

All of the road reserve appears to have been recently sprayed with herbicide. However, most plants were still alive/recognisable and/or thought to be capable of regenerating.

1. *Piptatherum miliaceum* (Rice Millett) grassland and sparse native grasses.

This is the dominant vegetation type along the road reserve, with Rice Millet generally the dominant plant. Road rubble occupies almost the entire verge, upon which native and exotic grasses and herbs have recolonised. Within this vegetation type a single plant of what is believed likely to be *Maireana rohrlachii* was recorded. Fruiting material however is needed for a definite identification.



Photo 14: Hoyleton Road from northern end. Sparse native and exotic herbs and grass regrowth on road rubble. Easting 274874 Northing 6232095 Facing south.



Photo 15: Hoyleton Road near northern end. Largely Rice Millet (Piptatherum miliaceum) regrowth on road rubble. Easting 274846 Northing 6231845. Facing south



Photo 16: Single individual recorded of what was thought to be Maireana excavata (regionally Vulnerable)

2. Acacia notabilis (Notable Wattle) – *Senna* species very open shrubland either side of drainage line with patches of dense *Cynodon dactylon* Couch grass or *Cenchrus clandestinus* Kikuyu grass

Either side of the drainage line are naturally occurring scattered shrubs with Couch or Kikuyu dense either side of the drainage line.

The pre-European vegetation is likely to have been a shrubland.



Photo 17: Hoyleton Road Scattered Shrubs otherwise largely exotic herbs ad grasses. Easting 274730 Northing 6230800. Facing north

3. *Enneapogon nigricans* Nine-awn Grass - *Piptatherum miliaceum* Rice Millett - *Cynodon dactylon* (Couch) grassland

The southern end of the reserve is also dominated by exotic grasses and herbs, but Nine-awn Grass is locally common (5 – 25% cover) along with sparse cover of other native grasses and herbs.

The pre-European vegetation is likely to have been a *Lomandra effusa* – *Lomandra multiflora* ssp dura grassland.

Plant Species recorded 15/8/2023

Scientific Name	Common Name	Cover/Abundance of species in each vegetation type*		
		1	2	3
Acacia notabilis	Notable Wattle		2	
Amyema preissii	Wire-leaf Mistletoe		1	
Aristida behriana	Brush Wire-grass	2	1	1
Austrostipa sp.	Spear-grass	2		1
Convolvulus angustissimus	Narrow-leaf Bindweed	1		
Convolvulus remotus	Grassy Bindweed	1		
Enneapogon nigricans	Nine-awn Grass	1		3
Enteropogon acicularis	Umbrella Grass	2		
Maireana brevifolia	Short-leaf Bluebush	1		
*Maireana excavata***	Bottle Fissure-plant	1		
Pseudognaphalium luteoalbum	Jersey Cudweed	1		
Rytidosperma sp.	Wallaby-grass	1		
Senna artemisioides ssp.	Senna		2	
Teucrium racemosum	Grey Germander		1	1
Vittadinia cervicularis var. cervicularis	Waisted New Holland Daisy			1

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

** No fruiting material but vegetatively appears to be *Maireana excavate.* Rated Vulnerable for the Region and Rare for South Australia.

Scientific Name	Common Name	Cover/Abundance of species in each vegetation type*		
		1	2	3
Asparagus asparagoides f.	Bridal Creeper		1	
Asphodelus fistulosus	Onion Weed			2
Cenchrus clandestinus	Kikuyu		3	
Centaurea melitensis	Malta Thistle	1a	2	2
Cynodon dactylon var. dactylon	Couch		3	3
Eucalyptus cladocalyx ssp.	Sugar Gum			1
Hordeum sp.				1
Limonium companyonis	Sea-lavender		1	
Malva parviflora	Small-flower Marshmallow	1a		1a
Onopordum acanthium	Scotch Thistle	1		
Oxalis pes-caprae	Soursob			1
Panicum capillare var. brevifolium	Witch-grass			1a
Piptatherum miliaceum	Rice Millet	3	2	3
Plantago lanceolata var.	Ribwort	1		
Salvia verbenaca var.	Wild Sage	2		1a
Scabiosa atropurpurea	Pincushion	2		1a
Solanum elaeagnifolium	Silver-leaf Nightshade	1		

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

MONDO ROAD RESERVE

Vegetation Associations

1: *Eucalyptus odorata – Eucalyptus socialis* Open Mallee

2. *Eucalyptus gracilis – Eucalyptus socialis* Open Mallee

3. *Eucalyptus gracilis – Eucalyptus socialis* Mallee

Length: Total length = 2236 m

Bushland Assessment Scores

Segment	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass	Condition Score	Length (m)
1	8	2	14	3	3	22	150
2	14	1	8	1	0	9	1085
3	14	3	11	4	1	25	750

N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%



Figure 6: Location of Vegetation Associations Mondo Road

Key Conservation Assets

19 native species recorded.

4 species with a Regional (St Vincent IBRA sub-region) conservation rating.

Valuable habitat corridor in a largely cleared landscape.

Old growth trees with numerous hollows.

Key Conservation Management Actions

Control Olives and Boxthorn (currently very sparse).

Control Cactus plant (or remove seedlings and ensure no further spread).

Manage grazing pressure to encourage regeneration.

Investigate of reduction of herbicide spraying either side of vehicle track is possible.

Adjoining Land Use: Cropping

Fencing and Infrastructure: The eastern half is fenced on the southern boundary only. The western half is fenced on both sides.

Vegetation Description:

1: *Eucalyptus odorata* Peppermint Box – *Eucalyptus socialis* Red Mallee Open Mallee

Occurs at the eastern end of the Reserve, over approximately 150 m. The open understorey contains sparsely scattered shrubs, largely Senna species. All plant species were heavily grazed, including juvenile Senna species. The groundcover is dominated by exotic herbs and grasses, particularly Soursob, Wild Oats and Barley-grass.

The trees are in poor health.

Both Peppermint Box and Red Mallee are rated Rare for the St Vincent IBRA sub-region.



Photo 18: Mondo Road Easting 262845 Northing 6256785.Bearing 240 degrees. Eucalyptus odorata – small patch at eastern end.

2. *Eucalyptus gracilis* (Yorrell) – *Eucalyptus socialis* (Red Mallee) Open Mallee

As with Vegetation Type 1, the trees are tall old growth mallees with numerous hollows. However, the mallees are of much reduced density and in poor health. The road reserve has also been sprayed up to 1 - 2 m in width either side of the vehicle track. Understorey shrubs are sparse and heavily grazed. The groundcover is dominated by exotic herbs and grasses, particularly Soursob, Wild Oats and Barley-grass.



Photo 19: Mondo Road Easting 262740 Northing 6256747. Bearing 240 degrees. Scattered Eucalyptus gracilis over Bromus diandrus, Oxalis pes-caprae and scattered shrubs.

3. *Eucalyptus gracilis* (Yorrell) – *Eucalyptus socialis* (Red Mallee) Mallee

This vegetation type occurs at the western end of the road reserve. The mallee trees are of higher density and healthier than those in the eastern half. Grazing pressure is also much reduced and native shrub diversity is greater than in the eastern half. This area also contains several Dryland Teatrees, *Melaleuca lanceolata,* which are considered Near Threatened for the St Vincent sub-region.



Photo 20: Mondo Road Easting 260990 Northing 6256227 Eucalyptus socialis – Eucalyptus gracilis denser mallee at western end of Road Reserve. Bearing 60 degrees.

Current Land Use: The road reserve includes a well-defined vehicle track, 4 – 5 m wide and is used for farm access.

Adjoining Land Use: Cropped both sides

Fencing and Infrastructure: A vehicle track traverses the whole area surveyed and beyond this, the vegetation has been sprayed for approximately 2 m either side of the road. Hence a total area cleared of about 8 m.

Native Plant Species recorded 15/8/2023

Scientific Name	Common Name	Vegetation Type & species cover/abundance*			Regional rating**
		1	2	3	
Acacia ligulata	Umbrella Bush	1	1	1	
Acacia oswaldii	Umbrella Wattle		1		
Atriplex stipitata	Bitter Saltbush			1	
Austrostipa sp.	Spear-grass	1a	1		
Callitris gracilis	Southern Cypress Pine		1		NT
Enchylaena tomentosa var. tomentosa	Ruby Saltbush		1	1	
Eucalyptus gracilis	Yorrell		2	3	
Eucalyptus odorata	Peppermint Box	3			R
Eucalyptus socialis ssp.	Beaked Red Mallee	3	2	3	R
Geijera linearifolia	Sheep Bush	1			
Maireana brevifolia	Short-leaf Bluebush	1	1	2	
Maireana trichoptera	Hairy-fruit Bluebush			1	
Melaleuca lanceolata	Dryland Tea-tree		1	2	NT
Pittosporum angustifolium	Native Apricot	1	2	2	
Rhagodia parabolica	Mealy Saltbush		2	2	
Rhagodia preissii ssp. preissii	Mallee Saltbush			1	
Salsola australis	Buckbush		1	1	
Sclerolaena diacantha	Grey Bindyi			1a	
Senna artemisioides ssp. petiolaris			2		

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

**NT = Near Threatened; R = Rare; V = Vulnerable

Introduced Plant Species recorded 15/8/2023

Scientific Name	Common Name	Vegetation Type & species cover/abundance*		
		1	2	3
Asphodelus fistulosus	Onion Weed			1
Avena barbata	Bearded Oat	3	3	2
Bromus diandrus	Great Brome	3	3	
Carrichtera annua	Ward's Weed		1a	
Carthamus lanatus	Saffron Thistle		1	
Citrullus sp.	Wild Melon		1	
Hordeum sp.			3	2
Lycium ferocissimum	African Boxthorn	1		1
Malva parviflora	Small-flower Marshmallow		2	2
Olea europaea ssp.	Olive		1	
Oxalis pes-caprae	Soursob	5	5	5
Sisymbrium erysimoides	Smooth Mustard		2	2

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

WATER RESERVE – Augusta Highway Snowtown

Vegetation Associations

1. Planted +/- naturally occurring Red Gums and dense regeneration
2. Exotic herbland
3. Planted *Eucalyptus leucoxylon ssp.* Blue Gums
4. *Casuarina glauca*, Swamp Oak, Planted *Eucalyptus cladocalyx*, Sugar Gums
5. Native grassland

Property Area: 5.095 ha

Bushland Assessment Scores (one Bushland conducted for whole Reserve)

Segment	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass	Condition Score
1	18	7	18	Not calc	1	25

***N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%**



Figure 7: Location of Vegetation Associations recorded in Water Reserve

Key Conservation Assets

19 native species recorded.

One species with a regional Conservation rating.

Retains very large Red Gums, some of which are thought to be remnant.

Localised areas of high native groundcover.

Key Conservation Management Actions

Control dense areas of Artichoke thistle, *Cynara cardunculus*.

Control Boxthorn, *Lycium ferocissimum* (localised, but a few dense patches).

Control spreading Swamp Oaks, *Casuarina glauca*.

Pre-European Vegetation:

A shallow drainage line traverses the Water Reserve from west to east (descending from the ranges to the west). However, the drainage line does not appear to retain remnant trees outside of the Reserve. It is classified as a Stream Order 3 (relatively minor) – compared with the Stream Order 4 drainage channel to the south of the Reserve, and which does retain a continuous canopy of trees, and the Wakefield River which is Stream Order 6 (NatureMaps 2023). The Stream Order 3 channel which traverses the Water Reserve is thought unlikely to to be able to support a dense cover of large Red Gums.

Within the Water Reserve, there are a few isolated very large Red Gums which are thought to be remnant. The Water Reserve therefore may have comprised a few or widely spaced Red Gums over a sedge and grassy understorey. Away from the drainage line, however, it may have supported a shrubland or grassland.

Vegetation Description:

1. Planted +/- naturally occurring *Eucalyptus camaldulensis ssp.* Red Gums and dense regeneration

It appears that a few naturally occurring Red Gums have been supplemented with plantings, from which there has been dense patches of regeneration. The two largest Red Gums in the Reserve had trunk diameters of approximately 1 m an 1.5 m. Ruby Saltbush, *Enchylaena tomentosa* and Pink Garland lily, *Calostemma purpurea* are common and widespread.



Photo 21: SA Water Reserve Easting 241404 Northing6266550. Bearing 45 degrees

2. Exotic herbland

The northern, south-western and south-eastern corners are largely exotic herbs and grasses including thistles and Wild Oats/



Photo 22: SA Water Reserve Easting 241532 Northing 6266769. Bearing 360 degrees. Exotic herb and grassland at northern end of Reserve, including Artichoke Thistle, Wild Oats and Wild Sage

3. Planted Blue Gums, *Eucalyptus leucoxylon* ssp

The planted Blue Gums are in very poor health and the understorey is largely exotic (Soursob and Wild Oat . Several trees are dead.

4. Naturalised Swamp Oak, *Casuarina glauca* and planted Sugar Gums, *Eucalyptus cladocalyx*

The Swamp Oaks may have been planted and/or spread from the adjoining Road Reserve where there is a dense row of Swamp Oaks.



Photo 23: SA Water Reserve Easting 241532 Northing 6266769. Bearing 180 degrees. Planted Sugar Gums, and also Swamp Gums, possibly escaped from roadside plantings

5. Native grassland

Adjoining the Road Reserve, native grasses cover up to 25 – 50% of the area, with *Enteropogon acicularis* most abundant, followed by Spear-grass.

Adjoining Land Use: Cropped both sides, and partially adjoins revegetation.

Fencing and Infrastructure: There are no internal tracks. A gate exists at the south-east corner and an older gate exists at the northern end. The boundary adjoining the cropping land is only partially fenced.

Native Plant Species recorded 15/8/2023

Scientific Name	Common Name	Regional rating**	Cover*
Acacia victoriae ssp.	Elegant Wattle		1
Austrostipa sp.	Spear-grass		1
Calostemma purpureum	Pink Garland-lily		1a
Convolvulus remotus	Grassy Bindweed		1
Einadia nutans ssp. nutans	Climbing Saltbush		2
Enchylaena tomentoa	Ruby Saltbush		2
Enteropogon acicularis	Umbrella Grass		1
Eucalyptus camaldulensis ssp.	River Red Gum		3
Juncus flavidus	Yellow Rush		2
Lythrum hyssopifolia	Lesser Loosestrife		1
Maireana brevifolia	Short-leaf Bluebush		1
Oxalis perennans	Native Sorrel		1
Pseudognaphalium luteoalbum	Jersey Cudweed		1
Rytidosperma sp.	Wallaby-grass		1
Setaria constricta	Knotty-butt Paspalidium	R	2
Teucrium racemosum	Grey Germander		1
Themeda triandra	Kangaroo Grass		1
Vittadinia sp.	New Holland Daisy		1
Walwhalleya proluta			

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

**NT = Near Threatened; R = Rare; V = Vulnerable

Exotic Plant Species recorded 15/8/2023

Scientific Name	Common Name	Cover*
Avena barbata	Bearded Oat	3
Casuarina glauca	Grey Buloak	2
Cirsium vulgare	Spear Thistle	2
Cynara cardunculus ssp. flavescens	Artichoke Thistle	2 to 3
Eucalyptus cladocalyx ssp.	Sugar Gum	2
Lepidium africanum	Common Peppercress	1
Lycium ferocissimum	African Boxthorn	2
Oxalis pes-caprae	Soursob	2
Romulea sp.	Onion-grass	2
Rumex crispus	Curled Dock	1
Salvia verbenaca var.	Wild Sage	2
Schinus molle	Pepper-tree	1

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

COPPER TRAIL RAIL RESERVE

Vegetation Associations

1. *Eucalyptus odorata - Callitris gracilis* Woodland
2. *Eucalyptus socialis* +/- *Eucalyptus phenax* Mallee +/- *Callitris gracilis*
3. *Callitris gracilis* woodland
4. *Eucalyptus porosa* Woodland
5. *Scabiosa* herbland
6. *Lomandra* open grassland

6a. *Lomandra very open* grassland

7. *Cenchrus clandestinus* grassland
8. *Austrostipa* grassland
9. *Eremophila longifolia* tall shrubland
10. *Senna artemisioides* ssp. Shrubland
11. Vehicle Track (with sparse *Cynodon dactylon)*

Length: Total length = 8600 m

Bushland Assessment Scores

Segment	No. of native species	Weed Threat Score	Structural Layer Score	Mature Tree Score	N:E Biomass*	Condition Score	Approx Length (m)
1	28	2	20	6	4	49	2000
2	22	1	18	6	5	40	550
3	24	0	18	8	4	46	410
4	16	3	20	6	4	45	170
5	7	3	10	Not applic	1	12	2500
6	22	9	12	Not applic	4	42	650
6a	17	7	12	Not applc	1	21	1200
7	12	2	6	Not applic	1	14	850
8	7	9	8	Not applic	3	19	180
9	13	4	16	Not applic	4	43	280
10	13	4	16	Not applic	4	43	500
11	nil						800

***N:E = native to exotic biomass. 0 = <5%; 1 = 5 – 10%; 2 = 10-20%; 3 = 20-40%; 4 = 40-80%; 5 = >80%**



Figure 8: Location of Vegetation Associations along Rail Corridor: Catford Road



Figure 9: Location of Vegetation Associations along Rail Corridor: Catford to Herds Hill Road



Figure 10: Location of Vegetation Associations along Rail Corridor: Herds Hill Road to Hoyleton

Key Conservation Assets

The Halbruy Parklands are well known for their very high conservation value – an important remnant of high plant species diversity in a highly cleared landscape.

65 native species recorded along the rail corridor on 16/8/2023

10 species with a regional Conservation rating.

Retains remnant patches of Lomandra grasslands, formerly widespread in the district and now almost entirely cleared.

Key Conservation Management

Mallee and Woodland Areas

Eradicate White Weeping Broom from Rail Corridor (currrently localised) – laregely confined to an area approximately 600 to 750 m east from the western end of Catford Road were it covers 5 – 25% of the old track.

Long-term program for Bridal Creeper and Scabiosa control

Grasslands and Shrublands

The following weeds are high priority for control but will require a long-term program with substantial resources. It is suggested that a weed program begin in areas of highest native cover.

- Fountain Grass
- Jonquil
- Scabiosa

Areas identified as Lomandra open grasslands are considered high priority for management control.

Vegetation Descriptions: Rail Corridor

Mallee/Woodland Associations

The rail corridor comprises high proportion of regrowth trees (compared with old growth remnant trees in the adjoining road reserve). Along the old track itself, regeneration of trees shrubs and groundcovers is occurring and locally abundant. For much of the corridor, weeds are most abundant on the old trac , with adjoining areas containing weeds of low densities.

1. *Eucalyptus odorata* Peppermint Box - +/- *Eucalyptus socialis* Red Mallee +/- *Callitris gracilis* (Native Pine) Woodland

There has been ongoing and widespread regeneration of the overstorey tree within the rail corridor. Prominent shrubs were *Acacia hakeoides*, Senna species and *Alyxia buxifolia* with a good diversity of native groundcovers. The main weed threats were Bridal Creeper (sparse to locally common) and Scabiosa.



Photo 24: Rail Corridor Easting 270908 Northing 6225732 Bearing west. Regeneration of Eucalyptus odorata, Eucalyptus socialis and Callitris gracilis within rail corridor.

2. *Eucalyptus socialis* (Red Mallee) +/- *Eucalyptus phenax* (Sessile-fruit Mallee) Mallee +/- *Callitris gracilis* (Native Pine)

The understorey is similar to Vegetation Type 1, the presence of *Eucalyptus phenax* distinguishing this vegetation type.



Photo 25: Rail Corridor Easting 270908 Northing 6225732 Bearing east. Regeneration of Eucalyptus socialis, Eucalyptus phenax and Callitris gracilis within rail corridor.

3. Callitris gracilis Native Pine Woodland

Relatively dense stands of Native Pine occur as a sole overstorey dominant, along the Road Reserve. The understorey is relatively open but contains species in common with Vegetation Associations 1 and 2. Regeneration of Native Pine is prolific.

Bridal Creeper is locally common.

4. Eucalyptus porosa (Mallee Box) – *Eucalyptus socialis* (Red Mallee) Woodland

Mallee Box is confined to one location along the rail corridor – and extends over about 100 m before merging into Red Mallee. *Senna artemisioides* and *Acacia hakeoides* are common understorey shrubs.

5. Sixalix atropurpurea (Scabiosa) herbland

Extensive areas of the Rail Corridor are dominated by Scabiosa (now known as *Sixalix atropurpurea*). Although dominated by exotic species, native species are also present and locally common, particularly *Calostemma purpurea* and *Austrostipa*, and management efforts should work out from localised areas of native cover



Photo 26: Dense Scabiosa, but also sparsely regenerating native grasses . Easting 273254 Northing 6227209 Bearing 70 degrees.

6. Lomandra Open Grassland

Areas of the rail corridor contain remnant *Lomandra effusa* and *Lomandra multiflora* ssp *dura* grassland with moderate to high native diversity. The combined cover of the Lomandra species is 5 – 25%.

This vegetation type is considered to be of high conservation value. Lomandra grassland would have been relatively extensive in this district prior to European settlement, but has been extensively cleared with existing remnants degraded.

6a. *Lomandra* very open grassland

These are areas now dominated by exotic species (including Scabiosa, Salvia, Maltese Thistle). However, *Lomandra effusa* Scented Mat-rush and *Lomandra multiflora* ssp *dura* Hard Mat-rush are very sparsely present, along with other natives that are locally common, particularly *Calostemma purpurea* Pink Garland-lily.

7. Fountain Grass, *Cenchrus clandestinus* grassland

Dense infestations of fountain grass occur along the road corridor, and are likely spreading. This is considered to be highly invasive and of high threat to native grasslands.

8. Austrostipa Spear-grass Grassland

Spear-grass dominates, with up to 25% cover, and Lomandra species are largely absent. Occurs over approximately 180 m.

9. Eremophila longifolia Weeping Emubush Tall Shrubland

Emu-bush is the dominant overstorey species over *Acacia hakeoides* and/or Senna shrubs over an area of approximately 280 m.

10. Senna artemisioides ssp. Shrubland

Several patches along the corridor are dominated by Senna shrubs with trees largely absent. Along the rail corridor, this may be due to a combination of tree clearance and natural shrubland areas.



Photo 27: Densely regenerating Senna artemisiodes ssp . Easting 271723 Northing 6226221. Bearing 70 degrees.

11. Vehicle Track (with sparse *Cynodon dactylon*)

North of Herds Hill Road, the western half of the corridor is a cleared track. This extends for approximately 800 m.

Vegetation Description: Caiford Road Reserve adjoining Rail Corridor

The road reserve contained the same overstorey domnants as the adjoiing rail corridor. However, the road reserve contained old growth remnant mallees, Peppermint Box and Native Pines (compared with the regrowth treees in the rail corridor). The understorey generally comprised dense shrubs, *including Alyxia buxifolia*, *Acacia hakeoides* and *Senna* species. However, Soursob and Bridal Creeper were widespread and often of high cover, the latter up to 25% cover over extensive areas.

Native Plant Species recorded 16/8/2023 – Woodland and Mallee Vegetation

Species	Common Name	Vegetation Type & species cover/abundance*				Regional rating**
		1	2	3	4	
Acacia hakeoides	Hakea Wattle	3	1	1	3	
Acacia ligulata	Umbrella Bush				1	
Acacia microcarpa	Manna Wattle	1	2			NT
Acacia notabilis	Notable Wattle	1		1	1	
Acacia oswaldii	Umbrella Wattle	1				
Acacia sclerophylla var. sclerophylla	Hard-leaf Wattle		1			
Alyxia buxifolia	Sea Box	2	3	2		
Amyema miquelii	Box Mistletoe	1			1	
Amyema preissii	Wire-leaf Mistletoe	1		1		
Arthropodium strictum	Common Vanilla-lily			1		
Austrostipa elegantissima	Feather Spear-grass	1		1		
Austrostipa sp.	Spear-grass	2	2	2	2	
Beyeria lechenaultii	Pale Turpentine Bush	1	1			
Callitris gracilis	Southern Cypress Pine	2	2	3		NT
Calostemma purpureum	Pink Garland-lily	1				
Dampiera rosmarinifolia	Rosemary Dampiera	1		1		NT
Dianella revoluta var. revoluta	Black-anther Flax-lily	2	1	1	2	
Dodonaea baueri	Crinkled Hop-bush	1				
Enchylaena tomentosa var. tomentosa	Ruby Saltbush	1	1	1	2	
Enneapogon nigricans	Nine-awn Grass				1	
Enteropogon acicularis	Umbrella Grass	1				
Eremophila longifolia	Weeping Emubush				1	
Eucalyptus odorata	Peppermint Box	3		1		R
Eucalyptus phenax ssp.			1			
Eucalyptus porosa	Mallee Box				3	
Eucalyptus socialis ssp.	Beaked Red Mallee	2	3		3	R
Goodenia pinnatifida	Cut-leaf Goodenia			1a		
Grevillea huegelii	Comb Grevillea	1	1			
Halgania cyanea	Rough Blue-flower	1	1			NT
Haloragis aspera	Rough Raspwort	1				R
Helichrysum leucopsideum	Satin Everlasting			1		
Lepidosperma viscidum	Sticky Sword-sedge			1		
Lomandra effusa	Scented Mat-rush	1	1	2		
Melaleuca lanceolata	Dryland Tea-tree		2			NT
Microtis sp.	Onion-orchid		1			
Minuria leptophylla	Minnie Daisy			1		
Pimelea microcephala ssp. microcephala	Shrubby Riceflower			1		
Pimelea serpyllifolia ssp. serpyllifolia	Thyme Riceflower		1	1		

Species	Common Name	Vegetation Type & species cover/abundance*				Regional rating**
		1	2	3	4	
Pittosporum angustifolium	Native Apricot		2	1	2	
Rhagodia preissii ssp. preissii	Mallee Saltbush	1		2	1	
Rytidosperma sp.	Wallaby-grass	2	2	2	2	
Santalum acuminatum	Quandong	2	2			
Sclerolaena diacantha	Grey Bindyi	1	1			
Senna artemisioides ssp. petiolaris		1		1		
Senna artemisioides ssp.	Silver Senna	2		1	3	
Sida corrugata var.	Corrugated Sida	1				NT
Stackhousia monogyna	Creamy Candles			1a		
Teucrium racemosum	Grey Germander	1				
Vittadinia cervicularis var. cervicularis	Waisted New Holland Daisy	1				
Vittadinia cuneata var.	Fuzzy New Holland Daisy			1		
Walwhalleya proluta	Rigid Panic	1				
Westringia rigida	Stiff Westringia		1			NT

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

**NT = Near Threatened; R = Rare; V = Vulnerable

Exotic Species recorded 16/8/2023 – Woodland/Mallee Associations

Species	Common Name	Vegetation Type & species cover/abundance*			
		1	2	3	4
Asparagus asparagoides f.	Bridal Creeper	1	1	3	
Asphodelus fistulosus	Onion Weed	1			
Avena barbata	Bearded Oat	3	3		
Brachypodium distachyon	False Brome	2	2		
Cirsium vulgare	Spear Thistle	1			
Cynodon dactylon	Couch	2			
Oxalis pes-caprae	Soursob	2	2	3	3
Retama raetam	White Weeping Broom			1	
Romulea sp.	Onion-grass	2			
Scabiosa atropurpurea	Pincushion	2		3	2
Sisymbrium erysimoides	Smooth Mustard	0			
Solanum elegnifolium	(blank)	1			
Symphyotrichum subulatum	Aster-weed			2	
Trifolium angustifolium	Narrow-leaf Clover				2

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

Native Species recorded 16/8/2023 – Grassland and Shrubland Associations

Species	Common Name	Vegetation Type & species cover/abundance*						
		5	6	6a	7	8	9	10
Acacia hakeoides	Hakea Wattle						3	1
Acacia notabilis	Notable Wattle				1			2
Acacia victoriae ssp.	Elegant Wattle				1			
Aristida behriana	Brush Wire-grass		0		1			
Austrostipa drummondii	Cottony Spear-grass			1				2
Austrostipa sp.	Spear-grass	1	2	2	2	4	2	2
Bursaria spinosa ssp. spinosa	Sweet Bursaria		1					
Calostemma purpureum	Pink Garland-lily	2	1	2	2	3	2	
Convolvulus angustissimus	Narrow-leaf Bindweed		1					
Convolvulus remotus	Grassy Bindweed		1					
Dampiera rosmarinifolia	Rosemary Dampiera			1				
Dianella revoluta var. revoluta	Black-anther Flax-lily	2	2	2		1	1	1
Enchylaena tomentosa var. tomentosa	Ruby Saltbush						1	1
Enneapogon nigricans	Nine-awn Grass		0	1	1			1
Enteropogon acicularis	Umbrella Grass	2		1	2			
Eremophila longifolia	Weeping Emubush						3	
Haloragis aspera	Rough Raspwort		0	0	1	1	1	1
Lepidosperma viscidum	Sticky Sword-sedge			1				
Lomandra effusa	Scented Mat-rush		2	1				
Lomandra multiflora ssp. dura	Hard Mat-rush		2	2				
Maireana enchylaenoides	Wingless Fissure-plant		1					
Maireana rohrlachii	Rohrlach's Bluebush		1					
Pimelea micrantha	Silky Riceflower		1	1		1		
Rhagodia preissii ssp. preissii	Mallee Saltbush						1	
Roepera glauca	Pale Twinleaf			1			1	
Rytidosperma sp.	Wallaby-grass		1		1		1	2
Senna artemisioides ssp. petiolaris		1		1	1		2	
Senna artemisioides ssp.	Twin-leaf Desert Senna		1		1		2	4
Stackhousia monogyna	Creamy Candles			2				
Teucrium racemosum	Grey Germander		1	1		1		
Themeda triandra	Kangaroo Grass	2	2	1	1		1	1
Vittadinia blackii	Narrow-leaf New Holland Daisy		1					
Vittadinia cervicularis var. cervicularis	Waisted New Holland Daisy		1			1		1
Vittadinia gracilis	Woolly New Holland Daisy		1					
Walwhalleya proluta	Rigid Panic	1	1					2

* 1 = < 1% and not many; 1a = < 1% but numerous; 2 = 1- 5%; 3 = 6 – 25%; 4 = 26 – 50%

Introduced Species recorded 16/8/2023 – Grassland and Shrubland Associations

Species	Common Name	Vegetation Type & species cover/abundance*						
		5	6	6a	7	8	9	10
Agave americana	Century Plant						1	
Asparagus asparagoides f.	Bridal Creeper						1	1
Asphodelus fistulosus	Onion Weed	1		2				2
Avena barbata	Bearded Oat	4		4				
Brachypodium distachyon	False Brome						3	
Briza maxima	Large Quaking-grass						2	
Briza sp.	Quaking Grass				2			
Carrichtera annua	Ward's Weed							2
Cenchrus setaceus	Fountain Grass			2	4			
Cynara cardunculus ssp. flavescens	Artichoke Thistle	1		1			1	
Malva parviflora	Small-flower Marshmallow	1						
Marrubium vulgare	Horehound							1
Narcissus jonquilla	Jonquill			1	2			
Oxalis pes-caprae	Soursob	2			3	3	2	2
Plantago lanceolata var.	Ribwort		2					
Salvia verbenaca var.	Wild Sage	1	2	2		1		
Sixalix atropurpurea	Pincushion	3	3	2		2	3	3
Sisymbrium erysimoides	Smooth Mustard	1						
Vicia sp.	Vetch	1		2	2	1		

SNOWTOWN (CONDOWIE) CEMETERY

The built portion of the reserve has been cleared of native vegetation and comprises planted exotic pines and exotic Eucalypts. The only remnant vegetation recorded were sparsely scattered *Maireana brevifolia* Short-leaf Bluebsush, and *Atriplex stipitata* Bitter Saltbush in the entrance driveway aera.

The majority of the cemetery reserve (surrounding the built cemetery) is cropped (Brassica, Medic and Legumes in August 2023) or has been ripped and being prepared for revegetation. The cropped area includes sparsely scattered *Enchylaena tomentosa* Ruby Saltbush and *Maireana brevifolia* Short-leaf Bluebush.

Adjoining roadside vegetation: Adjoining the southern half of the reserve is dense *Maireana brevifolia*, *Enchylaena tomentosa, Atriplex stipitata*. This vegetation type extends south continuously on this road reserve.

Adjoining the northern half of the cemetery is a *Maireana aphylla* Cottonbush shrubland, with occasional *Nitraria billardiera* and *Maireana brevifolia. Maireana aphylla* is associated with heavier soils, often lower lying areas or flood out areas. *Maireana aphylla* is widespread in this district and has been mapped for a length of approximately 4 km to the north of the cemetery, on the Condowie Plain Road.

Pre-European Vegetation:

The immediately surrounding land and surrounding district contains no remnant trees and is likely to have been a chenopod shrubland prior to settlement.

Revegetation of chenopod shrubs mirroring those in the adjoining roadside (and sparsely scattered throughout the cemetery reserve) is recommended.



Photo 28: Planted trees and cropped land surround the built cemetery. This is thought to be a naturally treeless plain, namely a chenopod shrubland



Photo 29: A planted tree and cropped land surround the built cemetery. This is thought to be a naturally treeless plain, namely a chenopod shrubland retained on the road reserve

WHITWARTA CEMETERY

The built part of the cemetery is relatively small and contains no remnant vegetation, except for a few scattered Red Gums adjoining the Wakefield River on the reserve's southern boundary. The Red Gums along the Wakefield River are in very poor health. There are also older plantings of exotic trees within the build cemetery area. A small area contains recent plantings, now about 1 m tall of mixed trees and shrubs (non-chenopod).

Adjoining Roadside Vegetation: The adjoining Road Reserve contains an extensive area of *Maireana aphylla* Cotton Bush shrubland (projective foliage cover of about 25%) of naturally low diversity. Other native plants recorded were *Enchylaena tomentosa*, *Enteropogon acicularis* and *Maireana brevifolia*.

The road reserve adjoining the recent plantings (91 m tall) has been sprayed out and formerly included *Maireana aphylla*.

Pre-European Vegetation: The cemetery is part of the Wakefield River floodplain and is likely to have been a *Maireana aphylla* shrubland prior to European settlement.

The River Red Gums lining the Wakefield River are in very poor health, possible suffering from long term declining water supply(?). The Wakefield River is not a high volume water course and is unlikely to have supported Red Gums beyond 20 – 30 m from the watercourse.

It is recommended that future revegetation includes a substantial component of *Maireana aphylla* and possibly *Maireana brevifolia*, *Atriplex stipitata* and *Enchylaena tomentosa*.



Photo 30: Maireana aphylla shrubland on Gold Course Road reserve adjoining cemetery



Photo 31: Recent plantings within cemetery reserve include Acacia notabilis, Acacia hakeoides and Eucalypts.

REFEERENCES

Native Vegetation Council (2020). Bushland Assessment Manual. Department for Environment and Water.

NatureMaps (2023). Enviro Data SA. Government of South Australia. NatureMaps Home (environment.sa.gov.au). Accessed August 2023.