Riesling Trail Vegetation Survey – Lennon Street Clare to Horrocks Highway Auburn

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Summary

A survey of the native and exotic vegetation along the Riesling Trail between Clare and Auburn was conducted in October 2012, using a ride-by method. For ease of surveying and data recording, the Trail was divided into 16 management sections. Overall, 82 indigenous native plant species, 108 introduced weeds species and at least 21 planted exotic native species were recorded.

The native vegetation along the Trail is predominantly SA Blue Gum (Eucalptus leucoxylon) grassy woodland. South of Leasingham it becomes more open, with native grasses, herbs and low shrubs, and scattered trees. Areas of the nationally threatened Peppermint Box Grassy Woodland ecological community are close by, but not represented along the Trail corridor. Areas of high biodiversity value vegetation on the Trail link to larger remnants in the landscape and provide important habitat for native animals, including declining woodland bird species. Some sections of the Trail, or areas within sections, are dominated by woody weeds (Olives, Pines, Hawthorn, Roses, Broom species) and grass weeds. Bridal Creeper was recorded in three sections, but may occur elsewhere along the Trail. The section with the highest native plant species diversity is between Morrison road Penwortham and Horrocks Road Watervale, with 37 indigenous native species. The section with the highest number of weed species is in Clare, between Lennon Street and Maynard Road.

This report identifies priorities for weed control, sites for bushcare regeneration and revegetation with indigenous native species, opportunities to raise awareness about biodiversity values of the Riesling Trail and activities that may involve local communities and volunteers in its management.

Introduction

The Riesling Trail Committee obtained a State NRM Grant for management of the Riesling Trail. This report documents a survey undertaken as part of that project to assist future planning and management activities.

Survey aims and method

Aims

The aims of the survey were to

- Conduct a survey of the vegetation of the Riesling Trail between Lennon Street, Clare and Horrock's Highway, Auburn;
- Identify sites of high biodiversity value;
- Identify invasive weeds requiring control;
- Prioritize areas for weed management;
- Outline areas for tubestock revegetation and natural regeneration;
- Recommend interpretive signage where appropriate; and
- Suggest possible options for raising awareness and improving biodiversity along the Trail.

Method

The survey was conducted using a ride-by method on bicycle. An average speed of about 10km/hour was maintained while using the "voice-record" function of an IPod Touch to record identified species plus any comments, with occasional stops for more detailed investigation where required. Recordings were later transcribed into text. Three trips were required to complete the surveys as the memory in "voice-record" mode of the IPod Touch filled after 1 hour.

The trail was divided into 16 sections (usually delineated by road intersections), to enable easy identification of particular sections of the trail, their biodiversity values and priority for weed management and other activities. Biodiversity values were assigned to each section, based on the native species diversity, connectivity with other remnant native vegetation and whether the section was known habitat for declining woodland bird species. Priority ratings for weed control were assigned to each section dependent on its biodiversity value and the presence of Weed of National Significance (WONS), Declared Weeds and Red Alert Weeds.

Early October was chosen as the optimum survey time, to identify the maximum number of plant species. Some early-flowering and later-flowering species may well have been missed: for example Brush Wire-grass (*Aristida behriana*) and other summer-active grasses are present along the trail, but not detected during these surveys. The ride-by survey also did not necessarily record all species growing on the tops of cuttings; for example Onion Orchid (*Microtis arenaria*) and Sun-orchid (*Thelymitra* sp.) had been recorded previously, growing on top of a cutting south of Pinks Reserve in Clare (J. Turner, unpublished species list for Leasingham Winery) but were not seen via the ride-by method.

Plant species lists were compiled using FlorList 2007, developed by Roger Taplin. Conservation ratings at the Australian, South Australian and regional (Northern Lofty Botanic Region) level are provided. A key to the conservation ratings is given in Appendix 1. The status of introduced weed species is also provided, according to whether they are Weeds of National Significance (WONS), Declared under the South Australian NRM Act 2004, or Red Alert environmental weeds of the Northern and Yorke Region. These ratings are described in more detail in the Weed Management section of this report.

Recommendations

Weed management, bushcare and revegetation

- A revegetation plan should be formulated before any large-scale woody weed removal commences, to ensure soil erosion is prevented and to lost habitat is replaced for dependent native birds (e.g. Yellow-rumped Thornbills and Silvereyes use Olives and Briar Roses at Watervale and south to Auburn; and Common Bronzewing Pigeons and Peaceful Doves shelter and feed in areas of Aleppo Pine.

- Ensure that any person involved in Aleppo Pine control can distinguish mature and juvenile Aleppo Pines from Native Pines (*Callitris gracils*) and Native Cherry (*Exocarpos cupressiformis*).

- Sites that have woody weed removal should undergo periodic monitoring for regeneration of weed seedlings, with follow-up control of these seedlings (many of the woody weed species have seeds that remain dormant in the soil for years).

- Any high biodiversity value section with WONS, Declared Weeds and Red Alert Weeds has a high priority rating for weed control and management, e.g. Sections 1, 3, 4, 7, 8, 9,13.

- Any Section containing a WONS species has a high priority for control of that weed even though it may have lesser weed priority rating overall, especially if the WONS weed is at the early stages of infestation e.g. Sections with Bridal Creeper, Flax-leaf Broom.

- Bridal Creeper (*Asparagus asparagoides*) occurs as low density, scattered infestations, but it is vital to get on top of this WONS weed before it gets out of control. A winter survey for actively growing plants is a priority in 2013 (maybe a volunteer working bee activity) to mark the location of infestations and record GPS grid references. Control options depend on the size of the infestation and the presence of native understory: they include hand digging and destruction off-site; wiping on herbicide using "tongs of death"; or biological control using rust fungus spore spray. Control sites need to be revisited in subsequent years, to remove germinating seedlings and re-treat regrowth.

- Cooperation should be sought with adjoining landholders wherever possible for control of WONS weeds e.g. working with Sevenhill Cellars to eradicate Boneseed,

Montpellier Broom and Flax-leaf Broom on both the Trail corridor and along College Rd.

- Monitor sites with exotic native plants that have the potential to become weeds

- Further revegetation to include species-targeted plantings such as Silver Banksia in Section 8 (not recorded in this survey, but occurs in St Marks Church cemetery at Penwortham), Native Pine in Section 1, and revegetation to extend and connect previous planting projects e.g. Sections 13, 14, 15 & 16.

- Bushcare restoration projects by community volunteers may be used to enhance natural regeneration e.g. in Sections 1, 5, 6, 7.

- Seek cooperation with adjoining landholders for rabbit control between Tatkana Rd and Pawelski Rd.

Community awareness and involvement

- Recognizing that the Riesling Trail Committee is a small group of people with varying interests, experience and time, it may require the cooperation and / or support of local communities, volunteers and adjoining landholders to achieve its aims. Potential support groups include Friends of the Riesling Trail, the N&Y Biodiversity and Endangered Species Team (BEST), Declining Woodland Birds Recovery Team, town Community Committees, Lower North NRM Group, local DEWNR staff etc.

- A campaign to heighten community awareness and involvement should be initiated. This could be done through signage, “Come and Try” bushcare weed control activities at selected sites, planting days, bird monitoring, bat and possum surveys and brochures.

- Ideas for signs include
  - Information about biodiversity features at high biodiversity sites (e.g. rare plants).
  - Acknowledgement of the community groups involved at previous revegetation areas e.g. north of Auburn.
  - Signs about declining woodland birds at southern section of Section 7, using White-winged Choughs as a flag-ship species (Choughs suggested as they are a large, easily observable raven-sized bird of interest to the Declining Woodland Bird Recovery team, are declining in other areas of the state, are frequently seen in this Section but are often confused with the Grey Currawong).
  - Moveable signs (perhaps sandwich board) at sites of woody weed control where the treated weeds are not immediately removed (e.g. Drill and Fill or Basal Bark) to explain the work underway. Provide information on the control method, the expected time for the weeds to die, plans for follow-up revegetation and contact details of the Riesling Trail Committee or appropriate NRM officer (for interested people seeking advice on using these methods on their land or adjoining roadsides).

- Bird Surveys could include “Bird-watching Blitzes” on a selected day, where a number of observers are each assigned to a particular section of the Trail and record

bird species over a fixed period from the same designated start time, e.g. 8 am. Or continue regular (seasonal) monitoring at the 5 sites previously selected by D. Potter and J. Turner.

- There are local people with experience in conducting bat surveys and possum spotlighting surveys that may be interested in running community monitoring sessions on these animals.

- Produce brochures of ***Birds of The Riesling Trail*** and ***Indigenous Native Plants of The Riesling Trail*** (Barinia to Auburn) and make them available for people to collect.

Vegetation Survey Results and Recommended Actions for Each Section

1. Lennon St to Maynard Rd

Current situation

- 16 indigenous native species, 47 introduced weed species and 6 exotic native (planted) species were recorded in this section
- High native species diversity on trail verge adjoining the cutting section between Lennon St and the southern Clare car park.
- Adjoins good remnant native woodland vegetation in Pink's Reserve and private land to south. These remnants are part of the Brushtail Possum population monitoring transect, surveyed by the BEST group.
- High number of weed species, including Weeds of National Significance, declared weeds (SA NRM Act) and Red Alert weeds.
- Section from south of the southern Clare car park to Maynard Rd is dominated by weeds and cultivated plants

Recommended actions

- Area between northern and southern car parks is a high priority for weed management and replacement (revegetation) with indigenous native species
- Link with weed management and supplementary revegetation of Mick Knappstein memorial plantings
- Link/cooperate with C&GV Council management of Pinks Reserve.

- Paucity of native species and large variety and density of weed species south of southern car park make this area a low priority for weed control work

Plants recorded in this section

Indigenous Native Species

Native Species - Scientific Name	Common Name	AUS	SA	NL
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Austrostipa sp	Spear Grass			
Bulbine bulbosa	Bulbine-Lily			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Callitris gracilis	Southern Cypress Pine			
Chrysocephalum apiculatum	Common Everlasting			
Dodonaea viscosa ssp.	Sticky Hop-Bush			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			

Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Lomandra densiflora	Soft Tussock Mat-Rush			
Rhagodia parabolica	Mealy Saltbush			
Vittadinia blackii	Narrow-Leaf New Holland Daisy			
Vittadinia cuneata var.	Fuzzy New Holland Daisy			

Note: Onion Orchid *Microtis arenaria* and Sun-orchid *Thelymitra* sp have been recorded previously on the top of the cutting (J Turner 1999, unpublished species list for Leasingham Winery)

Introduced Weed Species

Scientific Name	**Common Name**	**WONS**	**Declared**	**Red Alert**
*Allium triqetrum	Onion Grass			
*Arctotis stoechadifolia	Arctotis			Y
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-Grass			
*Bromus diandrus	Great Brome			
*Chamaecytisus palmensis	Tree Lucerne			Y
*Convolvulus arvensis	Field Bindweed		C	
*Cotoneaster simonsii	Cotoneaster			
*Crataegus monogyna	Hawthorn		C	Y
*Cupressus sempervirens	Candle Pine			
*Cydonia oblonga	Quince			
*Cynara cardunculus	Artichoke Thistle		C	Y
*Cytisus scoparius	English Broom	Y	C	Y
*Ehrharta longiflora	Annual Veldt Grass			
*Erodium botrys	Long Heron's-Bill			
*Euphorbia sp	Euphorbia			
*Felicia amelloides	Felicia			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Freesia sp	Freesia			Y
*Fumaria sp.	Fumitory			
*Gazania linearis	Gazania			Y
*Genista monspessulana	Montpellier Broom	Y		Y
*Gleditsia triacanthos	Honeylocust			
*Moraea flaccida	One-Leaf Cape Tulip		np	Y
*Iris germanica (cult)	Bearded Iris			
*Lavandula stoechas	Topped Lavender			Y
*Lolium rigidum	Wimmera Ryegrass			
*Malus sylvestris	Apple			

*Olea europaea ssp. europaea	Olive			Y
*Phalaris aquatica	Phalaris			
*Pinus halepensis	Aleppo Pine		C	Y
*Pinus radiata	Radiata Pine			Y
*Piptatherum miliaceum	Rice Millet			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus dulcis	Almond			
*Prunus sp.	Plum			
*Quercus canariensis	Canary Island Oak			
*Quercus robur	English Oak			
*Rosa canina	Dog Rose		np	Y
*Rosa rubiginosa	Sweet Briar		C	Y
*Scabiosa atropurpurea	Pincushion			
*Solidago canadensis	Golden Rod			
*Sparaxis tricolor	Tricolor Harlequin Flower			
*Ulex europaeus	Gorse	Y		Y
*Ulmus parvifolia	Chinese Elm			
*Vicia sativa ssp. sativa	Common Vetch			
*Vinca major	Blue Periwinkle			Y

Planted Exotic Native Species

Scientific Name	**Common Name**			
Acacia iteaphylla(cult)	Flinders Ranges Wattle		R	R
Eremophila sp (Cult)	Tar Bush			
Eucalyptus citriodora (Cult)	Lemon-Scented Gum			
Eucalyptus sideroxylon (Cult)	Red Ironbark			
Lomandra longifolia (Cult)	Spiny-head Mat-rush			
Melaleuca sp (cult)	Melaleuca			

2. Maynard Rd to Wendouree Rd

Current situation

- 3 indigenous native species, 34 introduced weed species and 4 exotic native (planted) species were recorded in this section
- Mainly high variety and density of weed species
- Ornamental plantings, including exotic natives and succulent species have been done. The Flinders Ranges Wattle and the succulents have potential to spread and become weeds.

Recommended actions

- Ash trees are a serious catchment problem & priority for removal as the Hutt River is nearby (within seed distribution zone from run-off)
- Otherwise, management priority in this section is low

- Potential to removed dead poplars and replant with small native trees (e.g. Drooping Sheoak)
- If adjoining property owners are interested and willing to do weed control and revegetation, RTC could provide them with appropriate information and guidance.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia paradoxa	Kangaroo Thorn			
Austrostipa sp	Spear Grass			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Agapanthus				
*Arctotheca calendula	Cape Weed			
*Arctotis stoechadifolia	Arctotis			Y
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Crataegus monogyna	Hawthorn		C	Y
*Erodium botrys	Long Heron's-Bill			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Fumaria sp.	Fumitory			
*Genista monspessulana	Montpellier Broom	Y		Y
*Gleditsia triacanthos	Honeylocust			
*Hemerocallis	Day Lily			
*Moraea flaccida	One-Leaf Cape Tulip		np	Y
*Iris germanica (cult)	Bearded Iris			
*Lactuca serriola	Prickly Lettuce			
*Lolium rigidum	Wimmera Ryegrass			
*Malus sylvestris	Crab Apple			
*Malva parviflora	Small-Flower Marshmallow			
*Olea europaea ssp. europaea	Olive			Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Piptatherum miliaceum	Rice Millet			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Populus nigra	Lombardy Poplar			
*Prunus domestica ssp. domestica	Plum			
*Prunus persica var. persica	Peach			
*Rosa canina	Dog Rose			

*Rosa rubiginosa	Sweet Briar		np	Y
*Rubus sp.	Blackberry	Y	C	Y
*Scabiosa atropurpurea	Pincushion			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Vinca major	Blue Periwinkle			Y
*Vulpia bromoides	Squirrel-Tail Fescue			
*Watsonia meriana var. bulbillifera	Bulbil Watsonia		C	Y

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia iteaphylla (Cult)	Flinders Ranges Wattle		R	R
Casuarina sp (Cult)	Sheoak			
Grevillea (Cult)	Grevillea			
Melaleuca sp (Cult)	Melaleuca			

3. Wendouree Rd to Quarry Rd Bridge

Current situation

- 32 indigenous native species, 41 introduced weed species and 4 exotic native (planted) species were recorded in this section
- Northern section (north of Show Grounds) is more weedy than further south
    - Some native trees and herbaceous understorey scattered amongst weeds
    - WONS, declared and Red Alert weeds present - e.g. **Bridal Creeper** & Pine species
    - Flinders Ranges Wattle has been planted – this exotic native can regenerate in good seasons and may become a weed problem
- Southern section (from north boundary of Show Grounds to Quarry Rd Bridge) is predominantly remnant SA Blue Gum grassy woodland vegetation
    - High biodiversity value – high native species diversity and good diversity of plant life forms
    - Adjoins a significant shrubby & grassy woodland remnant to the east; and native woodland in the Show Grounds
    - Weeds are more scattered, lower density – easier to manage effectively with a better outcome likely
    - Some WONS, declared and Red Alert weed species present, including **Bridal Creeper**

Recommended actions

- WONS, declared and Red Alert weeds e.g. **Bridal Creeper** & *Pinus* species are a high priority to control or contain
- The southern section is a high priority for weed control
- The northern section has lower priority for weed control, but Bridal Creeper and other WONS weeds need attention

    - RTC could provide information about weed control to interested adjoining landowners
- Revegetation – low priority (better to concentrate on managing weeds and retaining existing native plants)

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia pycnantha	Golden Wattle			
Acacia retinodes var. retinodes (hill form)	Wirilda			
Acaena echinata var.	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-Lily			
Asperula conferta	Common Woodruff			
Austrodanthonia sp	Wallaby Grass			
Austrostipa sp	Spear Grass			
Austrostipa sp very tall	Spear Grass			
Bulbine bulbosa	Bulbine-Lily			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Caesia calliantha	Blue Grass-Lily			
Callistemon rugulosus	Scarlet Bottlebrush			R
Callitris gracilis	Southern Cypress Pine			
Calocephalus citreus	Lemon Beauty-Heads			U
Chrysocephalum apiculatum	Common Everlasting			
Chrysocephalum semipapposum	Clustered Everlasting			Q
Dianella revoluta var. revoluta	Black-Anther Flax-Lily			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Exocarpos cupressiformis	Native Cherry			U
Goodenia pinnatifida	Cut-Leaf Goodenia			
Lomandra densiflora	Soft Tussock Mat-Rush			
Poa labillardieri var. labillardieri	Common Tussock-Grass			
Pultenaea largiflorens	Twiggy Bush-Pea			U
Senecio odoratus var. odoratus	Scented Groundsel			U
Senecio quadridentatus	Cotton Groundsel			
Stackhousia monogyna	Creamy Candles			
Themeda triandra	Kangaroo Grass			
Vittadinia blackii	Narrow-Leaf New Holland Daisy			N
Vittadinia cuneata var.	Fuzzy New Holland Daisy			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Asparagus asparagoides	Bridal Creeper	Y		Y
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Crataegus monogyna	Hawthorn		C	Y
*Cupressus macrocarpa	Monterey Cypress			
*Cynara cardunculus	Artichoke Thistle		C	Y
*Foeniculum vulgare	Fennel			
*Fraxinus rotundifolia ssp. rotundifolia	Desert Ash			Y
*Freesia sp	Freesia			Y
*Fumaria sp.	Fumitory			
*Genista monspessulana	Montpellier Broom	Y		Y
*Moraea flaccida	One-Leaf Cape Tulip		np	Y
*Hypericum perforatum	St John's Wort			
*Iris germanica (cult)	Bearded Iris			
*Lactuca serriola	Prickly Lettuce			
*Lavandula stoechas	Topped Lavender			Y
*Malus sylvestris	Crab Apple			
*Olea europaea ssp. europaea	Olive			Y
*Opuntia sp.	Prickly Pear	?		
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Pinus radiata	Radiata Pine			Y
*Piptatherum miliaceum	Rice Millet			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus domestica ssp. domestica	Plum			
*Pyrus communis	Pear			
*Retama raetam	White Weeping Broom			Y
*Rosa canina	Dog Rose		np	Y
*Rosa rubiginosa	Sweet Briar		C	Y
*Rubus sp.	Blackberry	Y	C	Y
*Rumex crispus	Curled Dock			
*Scabiosa atropurpurea	Pincushion			
*Crassulaceae species	Ornamental Succulent plants			
*Solanum nigrum	Black Nightshade			
*Sonchus oleraceus	Common Sow-Thistle			
*Ulmus parvifolia	Chinese Elm			
*Verbascum virgatum	Twiggy Mullein			
*Vicia sativa ssp. sativa	Common Vetch			
*Vitis vinifera	Grapevine			
*Vulpia bromoides	Squirrel-Tail Fescue			

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia iteaphylla (Cult)	Flinders Ranges Wattle		R	R
Melaleuca sp (Cult)	Melaleuca			
Melia azedarach var. australasica (Cult)	White Cedar			
Pittosporum angustifolium (Cult)	Native Apricot			

4. Quarry Rd Bridge to College Rd

Current situation

- 16 indigenous native species, 39 introduced weed species and 1 exotic native (planted) species were recorded in this section
- Moderate indigenous native species diversity
- This section of trail connects to large patches of remnant woodland vegetation on adjoining land owned by Sevenhill Cellars. The western remnant contains a nationally threatened orchid species, monitored and managed by the BEST group and NOSSA.
- These large remnant patches are known habitat for declining woodland birds including Crested Shrike-tits, Brown Treecreepers and White-winged Choughs
- A variety of WONS, Declared and Red Alert weeds present, including Montpellier Broom, Tree Lucerne, Aleppo Pine, Briar Rose, Olive seedlings and Phalaris in the northern section; and Boneseed, Flax-leaf Broom, Blue Periwinkle and Montpellier Broom in the southern section
- Herbicide resistant Wimmera Ryegrass is growing in areas adjoining the vineyards
- Black Wattle, an exotic native, is growing in the southern section; it may regenerate in good seasons and become a woody weed problem
- Mature Boneseed plants were removed in recent years, but seedlings have regenerated.

Recommended actions

- High priority for weed management, because of the WONS and Red Alert weed species threatening biodiversity in the adjoining large remnants.
- Boneseed requires ongoing annual management of regenerating seedlings
- Flax-leaf Broom (*Genista linifolia)* is an emerging weed issue and needs to be dealt with promptly. The infestation extends east along College Road, particularly the southern side and may be the original source of plants on the Riesling Trail.
- The Riesling Trail Committee should consult with Sevenhill Cellars and Clare & Gilbert Valleys Council on collaborative control of WONS weeds in this area, particularly Flax-leaf Broom and Boneseed, along the trail and along College Road.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia pycnantha	Golden Wattle			
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Austrostipa sp.	Spear-grass			
Bulbine bulbosa	Bulbine-lily			
Chrysocephalum apiculatum	Common Everlasting			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Exocarpos cupressiformis	Native Cherry			U
Geranium retrorsum	Grassland Geranium			
Haloragis 'lanceolate leaf' (aspera?)	Rough Raspwort			U
Lomandra densiflora	Soft Tussock Mat-rush			
Scaevola ameula	Fairy Fanflower			
Themeda triandra	Kangaroo Grass			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Arctotheca calendula	Cape Weed			
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-grass			
*Bromus diandrus	Great Brome			
*Chamaecytisus palmensis	Tree Lucerne			Y
*Chrysanthemoides monilifera ssp. monilifera	Boneseed	Y		Y
*Crataegus monogyna	Hawthorn		C	Y
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Echium plantagineum	Salvation Jane			
*Erodium botrys	Long Heron's-bill			
*Foeniculum vulgare	Fennel			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Fumaria sp.	Fumitory			
*Genista linifolia	Flax-leaf Broom	Y		Y
*Genista monspessulana	Montpellier Broom	Y		Y

*Hordeum hystrix	Mediterranean Barley-grass			
*Lactuca serriola	Prickly Lettuce			
*Lavandula stoechas	Topped Lavender			Y
*Lolium rigidum	Wimmera Ryegrass			
*Malva arborea	Tree Mallow			
*Moraea flaccida	One-leaf Cape Tulip		np	Y
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Oxalis purpurea	One-o'clock			
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus sp.	Plum			
*Pyrus communis	Pear			
*Rosa canina	Dog Rose		np	Y
*Rosa rubiginosa	Sweet Briar		C	Y
*Rumex crispus	Curled Dock			
*Scabiosa atropurpurea	Pincushion			
*Sonchus oleraceus	Common Sow-thistle			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Ulex europaeus	Gorse	Y		Y
*Vicia sativa ssp. sativa	Common Vetch			
*Vinca major	Blue Periwinkle			Y
*Vitis vinifera	Grape Vine			

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia mearnsii (cult)	Black Wattle			

5. College Rd to Mintaro Rd

Current situation

- 22 indigenous native species and 16 introduced weed species were recorded in this section. No exotic native (planted) species were recorded.
- Includes Sevenhill Railway Station precinct and adjoins Sevenhill Oval
- Continuation of the large woodland remnants north of College Road
- Good diversity of indigenous native species, including a variety of vegetation layers, good open areas of native grass understory, and numerous large Native Cherries
- Stand of mature Radiata Pines adjoining Sevenhill Oval – spread of seedlings and saplings into remnant areas needs to be limited and managed by removal.
- Scattered Briar Roses and Montpellier Broom plants need control

- Large infestation of Pincushion plant amongst native grass patches at the Station precinct
- Phalaris and Tall Wheat-grass are a problem in more open grassy woodland areas south of oval precinct – growing amongst good areas of native grasses

Recommended actions

- Overall Medium priority for weed management, but will have good outcomes and scope for improvement with less effort than many other areas
- Spread of Radiata Pine seedlings and saplings into remnant areas needs to be limited and managed by removal.
- control Phalaris and Tall Wheat-grass in more open grassy woodland areas south of oval using bushcare approach
- Sevenhill Railway Station precinct has potential for a bushcare restoration project by community volunteers
- While Pincushion plant is not a Red Alert environmental weed in our region, it is considered a significant weed of disturbed grassy ecosystems and could be managed as part of a community bushcare program at the Station precinct.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia pycnantha	Golden Wattle			
Acacia retinodes var. retinodes	Wirilda			
Acacia wattsiana	Dog Wattle			
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-lily			
Austrostipa mollis	Soft Spear-grass			
Austrostipa sp.	Spear-grass			
Bulbine bulbosa	Bulbine-lily			
Calocephalus citreus	Lemon Beauty-heads			
Calostemma purpureum	Pink Garland-lily			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Distichlis distichophylla	Emu-grass			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Exocarpos cupressiformis	Native Cherry			
Haloragis 'lanceolate leaf' (aspera?)	Rough Raspwort			
Lomandra densiflora	Soft Tussock Mat-rush			
Stackhousia monogyna	Creamy Candles			
Themeda triandra	Kangaroo Grass			
Wahlenbergia communis	Tufted Bluebell			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Arctotheca calendula	Cape Weed			
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Foeniculum vulgare	Fennel			
*Genista monspessulana	Montpellier Broom	Y		Y
*Lactuca serriola	Prickly Lettuce			
*Moraea flaccida	One-leaf Cape Tulip		np	Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Pinus radiata	Radiata Pine			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Rosa canina	Dog Rose		np	Y
*Scabiosa atropurpurea	Pincushion			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Thinopyrum elongatum	Tall Wheat-grass			Y

6. Mintaro Rd to Tatkana Rd

Current situation

- 16 indigenous native species and 14 introduced weed species were recorded in this section. No exotic native (planted) species were recorded
- Open grassy woodland vegetation with scattered SA Blue Gum trees
- Moderate biodiversity value, but some areas with good stands of diverse native grasses
- Patches with heavy infestations of Phalaris and St John's Wort

Recommended actions

- Weed control needs to be selective – minimum disturbance bushcare, to encourage regeneration of native grasses & other species
- Lower priority than Section 5 or 7, but important because it connects those two
- Priority for work Medium; has potential for a community bushcare project.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia pycnantha	Golden Wattle			
Acacia wattsiana	Dog Wattle			N
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-lily			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa eremophila	Rusty Spear-grass			
Austrostipa sp.	Spear-grass			
Austrostipa sp. Tall (blackii?)	Spear-grass			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Gonocarpus elatus	Hill Raspwort			
Lomandra densiflora	Soft Tussock Mat-rush			
Themeda triandra	Kangaroo Grass			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Convolvulus arvensis	Field Bindweed		C	
*Echium plantagineum	Salvation Jane			
*Hypericum perforatum	St John's Wort			
*Lolium rigidum	Wimmera Ryegrass			
*Moraea flaccida	One-leaf Cape Tulip		np	Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Pyrus communis	Pear			
*Rumex crispus	Curled Dock			
*Scabiosa atropurpurea	Pincushion			
*Scilla sp.	Lily (introduced Bluebell)			

7. Tatkana Rd to Penwortham (Pawelski Rd)

Current situation

- 34 indigenous native species, 28 introduced weed species and 1 exotic native (planted) species were recorded in this section
- This section has the second highest native species diversity and has high biodiversity value.
- Includes state-listed Pale Flax-lily (Rare in SA), and species which are rare (Soft Spear-grass, Little Sword-sedge) or restricted in distribution to the NL region (Wirilda).
- Good diversity of plant life forms
- Known habitat of several declining woodland bird species, including a "resident group" of the state Rare White-winged Chough, Common Bronzewing Pigeon, Brown Treecreeper, Peaceful Dove, Dusky Woodswallow and Rainbow Bee-eater
- Also has significant environmental weed issues – Aleppo Pines, Topped lavender, Montpellier Broom, Briar Roses, patches of Phalaris, smaller number of Olives, Desert Ash – all a high priority for control or containment.

Recommended actions

- Recognize the Aleppo Pines are a landscape feature of the trail, but their on-going spread into adjoining good quality vegetation should be prevented, and the potential for a gradual long-term removal and replacement program with native tree species (e.g. Native Pines and Drooping Sheoaks) investigated
- Also a known area of Rabbit infestation – Rabbit control a high priority
- The quarry area has potential for weed management and minor restoration (regeneration of native understorey to replace large patches of weed e.g. Topped lavender) as an ephemeral wetland
- Important to remove Topped Lavender by bushcare method, north of the Aleppo Pines and around the quarry area – potential for community working bees
- Priority for weed control work & management is High
- Priority for revegetation is Low.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia notabilis	Notable Wattle			
Acacia pycnantha	Golden Wattle			
Acacia retinodes var. retinodes	Wirilda			Q
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-lily			
Astroloma humifusum	Cranberry Heath			
Austrostipa mollis	Soft Spear-grass			R
Austrostipa sp.	Spear-grass			
Bulbine bulbosa	Bulbine-lily			

Caesia calliantha	Blue Grass-lily			
Calocephalus citreus	Lemon Beauty-heads			U
Carex sp.	Sedge			
Chrysocephalum apiculatum	Common Everlasting			
Clematis microphylla var. microphylla	Old Man's Beard			
Dianella longifolia var. grandis	Pale Flax-lily		R	T
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Eucalyptus odorata	Peppermint Box			
Exocarpos cupressiformis	Native Cherry			
Gonocarpus elatus	Hill Raspwort			
Haloragis 'lanceolate leaf' (aspera?)	Rough Raspwort			U
Juncus sp. 1 'small'	Rush			
Juncus sp. 2	Rush			
Lepidosperma curtisiae	Little Sword-sedge			R
Lomandra densiflora	Soft Tussock Mat-rush			
Luzula meridionalis	Common Wood-rush			
Melaleuca lanceolata	Dryland Tea-tree			
Pimelea glauca	Smooth Riceflower			
Poa labillardieri var. labillardieri	Common Tussock-grass			
Pultenaea largiflorens	Twiggy Bush-pea			U
Ranunculus sp.	Buttercup			
Stackhousia monogyna	Creamy Candles			

Introduced Weed Species

Scientific Name	**Common Name**	**WONS**	**Declared**	**Red Alert**
*Arctotheca calendula	Cape Weed			
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-grass			
*Bromus rigidus	Rigid Brome			
*Chamaecytisus palmensis	Tree Lucerne			Y
*Crataegus monogyna	Hawthorn		C	Y
*Ehrharta longiflora	Annual Veldt Grass			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Fumaria sp.	Fumitory			
*Genista monspessulana	Montpellier Broom	Y		Y
*Hypericum perforatum	St John's Wort			
*Hypochaeris sp.	Cat's Ear			

*Lavandula stoechas	Topped Lavender			Y
*Moraea flaccida	One-leaf Cape Tulip			
*Olea europaea ssp. europaea	Olive			
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Pinus radiata	Radiata Pine			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Rosa rubiginosa	Sweet Briar		C	Y
*Rubus sp.	Blackberry	Y	C	Y
*Rumex crispus	Curled Dock			
*Scabiosa atropurpurea	Pincushion			
*Solanum nigrum	Black Nightshade			
*Trifolium angustifolium	Narrow-leaf Clover			
*Vulpia myuros	Fescue			
*Watsonia meriana var. bulbillifera	Bulbil Watsonia		C	Y

Planted Exotic Native Species

Scientific Name	**Common Name**	**AUS**	**SA**	**NL**
Westringia sp. (cult)	Westringia			

8. Pawelski Rd to Morrison Rd

Current situation

- 11 indigenous native species, 18 introduced weed species and 6 exotic native (planted) species were recorded in this section
- Very weedy section, with native species interspersed
- Weeds comprise mainly large woody shrubs (including Montpellier Broom, Tree Lucerne, Cotoneaster) and trees (Olives, Hawthorn)
- **Bridal Creeper** in section adjoining St Mark's Anglican Church grounds is a high priority for control
- Extensive stand of Topped Lavender on steep slopes of the cuttings, esp. the northern end – too extensive to remove and dangerous to work on
- Cultivated plants adjoining residential properties

Recommended actions

- Potential for targeted revegetation of Silver Banksias (Rare in NL region and occurring naturally in the St Mark's Anglican Church cemetery) in open patches of the trail south of the church precinct. (if revegetation done, it should use locally collected seeds, and plants will need follow-up watering and sturdy tree guards for protection from kangaroo browsing) - High priority due to limited occurrence of this species.

- Topped Lavender on the cuttings are possibly too extensive to remove and dangerous to work on
- High priority for **Bridal Creeper** control.
- Low priority for other weed control.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Atriplex semibaccata	Berry Saltbush			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa mollis	Soft Spear-grass			R
Austrostipa sp.	Spear-grass			
Epilobium billardierianum ssp. cinereum	Variable Willow-herb			R
Exocarpos cupressiformis	Native Cherry			U
Lomandra densiflora	Soft Tussock Mat-rush			
Phragmites australis	Common Reed			
Poa labillardieri var. labillardieri	Common Tussock-grass			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Asparagus asparagoides	Bridal Creeper	Y		Y
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-grass			
*Bromus diandrus	Great Brome			
*Bromus sp.	Brome			
*Chamaecytisus palmensis	Tree Lucerne			Y
*Cotoneaster sp	Cotoneaster			
*Crataegus monogyna	Hawthorn		C	Y
*Lavandula stoechas	Topped Lavender			Y
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Prunus sp.	Plum			
*Rosa canina	Dog Rose		np	Y
*Rubus sp.	Blackberry	Y	C	Y
*Scabiosa atropurpurea	Pincushion			
*Vinca major	Blue Periwinkle			Y

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia baileyana (cult)	Cootamundra Wattle			
Acacia iteaphylla (cult)	Flinders Ranges Wattle		R	R
Acacia longifolia (cult)	Coastal Wattle			
Callistemon sp (cult)	Bottlebrush			
Eucalyptus sp (WA)	Eucalypt			
Leptospermum sp (cult)	Tea-tree			

9. Morrison Rd to Mt Horrocks Rd

Current situation

- 37 indigenous native species, 31 introduced weed species and 5 exotic native (planted) species were recorded in this section
- High biodiversity value
- Highest diversity of native plant species in this section, concentrated mainly from the southern end of the cutting, to a few hundred metres north of the wooden bridge
- Some plant species not found in other sections – including Matted Bush-pea and Peach Heath, both rare in NL region
- Good variety of plant life forms, and adjoins large areas of SA Blue Gum grassy woodland remnants, especially on the western side of the trail
- Known habitat of declining woodland bird species including Diamond Firetail, White-winged Choughs, Peaceful Doves and Common Bronzewing Pigeons
- Chipper mulch from pruning trees under power line adjoining trail was spread thickly onto numerous understorey plants in the high species diversity area, restricting regeneration of many of these plants
- Currant grapes (*Vitis vinifera*) grow on the trail verge approximately 100 m north of Horrocks Rd. They may be considered a "cultural heritage" feature as this variety is rarely grown now. Could be trellised to make a feature of them. Weed management for Olives, Briar Roses and Phalaris would also be needed at the site.
- High variety of weed species along this section, including WONS, declared and Red Alert weeds.
- **Bridal Creeper** in cutting, resprouting through chipper mulch
- Weed cover quite dense and native species diversity much lower in section south of the cutting and section north of the western bush block.
- Skeleton weed seen in summer, growing through trail surface towards southern end of this section (species not seen anywhere along trail in previous 10 years).

Recommended actions

- High priority for targeted weed control – focus on areas of high native plant species diversity in middle of this section.

- Laying of heavy mulch on remnant native vegetation in this area should be avoided in future – may require notification and site visit with contractor.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-Lily			
Asperula conferta	Common Woodruff			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa mollis	Soft Spear-Grass			R
Austrostipa sp.	Spear-Grass			
Bulbine bulbosa	Bulbine-Lily			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Caesia calliantha	Blue Grass-Lily			
Calostemma purpureum	Pink Garland-Lily			
Chrysocephalum apiculatum	Common Everlasting			
Convolvulus erubescens complex	Native Bindweed			
Convolvulus remotus	Grassy Bindweed			
Dianella revoluta var. revoluta	Black-Anther Flax-Lily			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Eutaxia microphylla (prostrate form)	Common Eutaxia			
Exocarpos cupressiformis	Native Cherry			
Geranium retrorsum	Grassland Geranium			
Gonocarpus elatus	Hill Raspwort			
Goodenia blackiana	Native Primrose			R
Haloragis 'lanceolate leaf' (aspera?)	Rough Raspwort			U
Hardenbergia violacea	Native Lilac			U
Leptorhynchos squamatus ssp. squamatus	Scaly Buttons			
Lissanthe strigosa ssp. subulata	Peach Heath			R
Lomandra densiflora	Soft Tussock Mat-Rush			
Plantago varia complex	Native Plantain			
Pultenaea pedunculata	Matted Bush-Pea			R
Stackhousia monogyna	Creamy Candles			
Themeda triandra	Kangaroo Grass			
Thysanotus patersonii	Twining Fringe-Lily			
Velleia arguta	Toothed Velleia			
Wahlenbergia luteola	Yellow-Wash Bluebell			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Arctotheca calendula	Cape Weed			
*Asparagus asparagoides	Bridal Creeper	Y		Y
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-Grass			
*Bromus rigidus	Rigid Brome			
*Crataegus monogyna	Hawthorn		C	Y
*Echium plantagineum	Salvation Jane			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Freesia cultivar	Freesia			Y
*Fumaria sp.	Fumitory			
*Galium tricornutum	Three-Horned Bedstraw			
*Hypericum perforatum	St John's Wort			
*Lactuca serriola	Prickly Lettuce			
*Malus pumila	Apple			
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus cerasifera	Cherry-Plum			
*Prunus dulcis	Almond			
*Prunus sp.	Plum			
*Rosa rubiginosa	Sweet Briar		C	Y
*Rubus sp.	Blackberry	Y	C	Y
*Scabiosa atropurpurea	Pincushion			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Ulex europaeus	Gorse	Y		Y
*Verbascum virgatum	Twiggy Mullein			
*Vicia sativa ssp. sativa	Common Vetch			
*Vinca major	Blue Periwinkle			Y
*Vitis vinifera	Grape Vine			

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia iteaphylla (cult)	Flinders Ranges Wattle		R	R
Casuarina cunninghamiana (cult)	River Oak			
Eucalyptus sp. (planted)	Gum			

Melaleuca armillaris ssp armillaris (cult)	Bracelet Honey-Myrtle			
Westringia sp. (cult)	Slender Westringia			

10. Mt Horrocks Rd to North Terrace (Watervale)

Current situation

- 19 indigenous native species, 21 introduced weed species and 1 exotic native (planted) species were recorded in this section
- Moderate biodiversity value
- Some of the indigenous native species diversity in this area is due to plantings by an adjoining landholder (e.g. Silver Banksias, Hardenbergia, Scarlett Bottlebrush, Wreath Wattle)
- Native lemon Grass (*Cymbopogon ambiguus*) grows in the cutting, but is generally sprayed out during weed control program along trail edges, and was not recorded during spring surveys
- Extensive stand of Aleppo Pines in the cutting - some control work was done in the past, but mature trees weren't removed and there was no follow-up control of regenerated seedlings
- Extensive areas of Phalaris, Olives, some Montpellier Broom and Briar Rose
- Some control of other weeds done in the past by adjoining landholder

Recommended actions

- Low priority for weed control, apart from Aleppo Pine stand
- Long-term program to remove Aleppo Pines and replace with Native Pines, Drooping Sheoaks and Hardenbergia, with plantings focused along the tops of cuttings, not on the slopes.
- Short-term priority to control seedlings and contain their spread.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia acinacea	Wreath Wattle			U
Acacia pycnantha	Golden Wattle			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Austrodanthonia sp.	Wallaby Grass			
Banksia marginata	Silver Banksia			R
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Callistemon rugulosus	Scarlet Bottlebrush			
Callitris gracilis	Southern Cypress Pine			
Dodonaea viscosa	Sticky Hop-bush			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			

Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Eucalyptus odorata	Peppermint Box			
Hardenbergia violacea	Native Lilac			U
Kennedia prostrata	Scarlet Runner			
Melaleuca lanceolata	Dryland Tea-tree			
Pimelea glauca	Smooth Riceflower			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N

Introduced Weed Species

Scientific Name	**Common Name**	**WONS**	**Declared**	**Red Alert**
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Bromus sp.	Brome			
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Erodium botrys	Long Heron's-bill			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Fumaria sp.	Fumitory			
*Genista monspessulana	Montpellier Broom	Y		Y
*Lolium rigidum	Wimmera Ryegrass			
*Olea europaea ssp. europaea	Olive			Y
*Pelargonium hybrid	Garden Geranium			
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Piptatherum miliaceum	Rice Millet			Y
*Raphanus raphanistrum	Wild Radish			
*Rosa rubiginosa	Sweet Briar		C	Y
*Scabiosa atropurpurea	Pincushion			
*Solanum nigrum	Black Nightshade			
*Vinca major	Blue Periwinkle			Y
*Vitis vinifera	Grape Vine			

Planted Exotic Native Species

Scientific Name	**Common Name**	**AUS**	**SA**	**NL**
Casuarina cunninghamiana (cult)	River Oak			

11. North Terrace to St Vincent Rd. - Watervale Railway Yard

Current situation

- 8 indigenous native species and 18 introduced weed species were recorded in this section; no exotic native (planted) species were recorded
- Modest native species diversity, but has good stands of Kangaroo Grass and Wallaby Grass.
- Scattered woodland trees
- Important to retain existing stands of native grasses (protect from trail edge spraying)
- High variety of weeds, including WONS (Montpellier Broom) and Red Alert weeds (Olives, Aleppo Pines)

Recommended actions

- Limited opportunity to effectively control Olives along this section of trail, due to numbers in the surrounding landscape
- Railway yard may provide opportunity for a community bush regeneration project, depending on land ownership and preferred land use – focus on River Red Gums, SA Blue Gums, Wattles (*A pycnantha* & *A paradoxa*) and Bursaria.
- Low priority for Riesling Trail Committee to do weed control

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Amyema miquelii	Box Mistletoe			
Austrodanthonia sp.	Wallaby Grass			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Lomandra densiflora	Soft Tussock Mat-rush			
Themeda triandra	Kangaroo Grass			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Echium plantagineum	Salvation Jane			

*Genista monspessulana	Montpellier Broom	Y		Y
*Lolium rigidum	Wimmera Ryegrass			
*Moraea flaccida	One-leaf Cape Tulip		np	Y
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Pinus halepensis	Aleppo Pine		C	Y
*Piptatherum miliaceum	Rice Millet			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus dulcis	Almond			
*Raphanus raphanistrum	Wild Radish			
*Rosa canina	Dog Rose		np	Y
*Scabiosa atropurpurea	Pincushion			
*Vicia sativa ssp. sativa	Common Vetch			
*Vitis vinifera	Grape Vine			

12. St Vincent Rd to Wakefield Rd (Leasingham)

Current situation

- 11 indigenous native species, 25 introduced weed species and 1 exotic native (planted) species were recorded in this section
- Modest native species diversity, but has good variety of native grasses – Silky Blue-grass (rare in NL region), Kangaroo Grass, Wallaby Grasses and Speargrasses
- More open grassy woodland and grassland, characteristic of the southern end of the trail
- Adjoins or connects to large remnants of SA Blue Gum grassy woodlands on the hills west and east of the trail
- Patch of Aleppo Pines towards northern end of section, spreading into adjoining areas
- Some open areas with dense patches of Phalaris.

Recommended actions

- Long term program for removal of Aleppo Pines and replacement with Native Pines, and Drooping Sheoaks
- Aleppo Pine seedling regeneration needs to be controlled and contained
- Minor infestations of Briar Roses along the whole section, and scattered smaller Olives in southern section, could be removed
- Medium priority for revegetation with local tree & shrub species, including *Eucalyptus odorata*; note some areas would require Phalaris control for this to happen

Indigenous Native Species

Scientific Name	**Common Name**	**AUS**	**SA**	**NL**
Acacia pycnantha	Golden Wattle			

Amyema miquelii	Box Mistletoe			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa sp.	Spear-grass			
Convolvulus erubescens complex	Native Bindweed			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Dichanthium sericeum ssp. sericeum	Silky Blue-grass			R
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Kennedia prostrata	Scarlet Runner			
Themeda triandra	Kangaroo Grass			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N

Introduced Weed Species

Scientific Name	**Common Name**	**WONS**	**Declared**	**Red Alert**
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Centaurea sp.	Centaury			
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Echium plantagineum	Salvation Jane			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Hypericum perforatum	St John's Wort			
*Lagurus ovatus	Hare's Tail Grass			
*Malus pumila	Apple			
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			
*Pinus halepensis	Aleppo Pine		C	Y
*Prunus cerasifera	Cherry-plum			
*Prunus dulcis	Almond			
*Prunus persica var. nectarina	Nectarine			
*Pyrus communis	Pear			
*Rosa rubiginosa	Sweet Briar		C	Y
*Scabiosa atropurpurea	Pincushion			
*Sonchus oleraceus	Common Sow-thistle			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Vicia sativa ssp. sativa	Common Vetch			
*Vitis vinifera	Grape Vine			
*Vulpia bromoides	Squirrel-tail Fescue			

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Eucalyptus sp (WA) (Cult)	Eucalypt			

13. Wakefield Rd to Mulkiri Rd

Current situation

- 19 indigenous native species and 29 introduced weed species were recorded in this section; no exotic native (planted) species were recorded
- Moderate biodiversity value
- Good total native species diversity along this section, but concentrated in localised patches, interspersed with more weedy areas
- At the northern end the native woodland vegetation adjoins a significant remnant of Peppermint Box grassy woodland on adjoining private land and roadsides. These remnants connect to larger patches in the Skilly Hills, making this area of the trail a high priority for restoration work.
- Significant weeds at the northern end include Olives, Montpellier Broom, Briar Roses and Pincushion which are impacting on the native understorey and tree health
- South of the woodland area is more open, with infestations of Phalaris, Olives, Artichoke Thistle, Pincushion, Onion Weed and Hawthorn
- The cuttings have a different mix of native species, with Pimelea, Running Postman, Fan Flower and Native Pines growing on the slopes, and SA Blue Gums along the top
- Many of the SA Blue Gums are in poor health, with heavy burdens of Box Mistletoe

Recommended actions

- High priority for weed control at the northern end, Low priority elsewhere in this section
- Medium priority for revegetation with Peppermint Box, SA Blue Gum, Drooping Sheoak, native Pine and Bursaria.
- Both weed control and revegetation may be possible with input of community volunteers and adjoining landholders including local winery

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia pycnantha	Golden Wattle			
Amyema miquelii	Box Mistletoe			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa sp.	Spear-grass			
Callitris gracilis	Southern Cypress Pine			
Calostemma purpureum	Pink Garland-lily			

Convolvulus erubescens complex	Native Bindweed			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Exocarpos cupressiformis	Native Cherry			U
Kennedia prostrata	Scarlet Runner			
Lomandra densiflora	Soft Tussock Mat-rush			
Lomandra multiflora ssp. dura	Hard Mat-rush			
Pimelea glauca	Smooth Riceflower			
Scaevola aemula	Fanflower			
Stackhousia monogyna	Creamy Candles			
Themeda triandra	Kangaroo Grass			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N
Vittadinia cuneata	Fuzzy New Holland Daisy			

Introduced Weed Species

Scientific Name	**Common Name**	**WONS**	**Declared**	**Red Alert**
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Crataegus monogyna	Hawthorn		C	Y
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Cynodon dactylon var. dactylon	Couch			
*Echium plantagineum	Salvation Jane			
*Erodium botrys	Long Heron's-bill			
*Euphorbia terracina	False Caper			
*Fumaria sp	Fumitory			
*Genista monspessulana	Montpellier Broom	Y		Y
*Lactuca serriola	Prickly Lettuce			
*Malus pumila	Apple			
*Moraea flaccida	One-leaf Cape Tulip		np	Y
*Nicotiana glauca	Tree Tobacco			
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Prunus dulcis	Almond			
*Prunus sp.	Plum			
*Rapistrum rugosum ssp. rugosum	Turnip Weed			
*Rosa rubiginosa	Sweet Briar		C	Y

*Scabiosa atropurpurea	Pincushion			
*Solanum elaeagnifolium	Silver-leaf Nightshade		N	
*Sonchus oleraceus	Common Sow-thistle			
*Trifolium campestre	Hop Clover			
*Trifolium hirtum	Rose Clover			
*Vicia sativa ssp. sativa	Common Vetch			

14. Mulkiri Rd to Greenwood Park Rd

Current situation

- 12 indigenous native species, 16 introduced weed species and 3 exotic native (planted) species were recorded in this section
- Modest native species diversity, some due to plantings by an adjoining landowner
- High variety of weed species, including Red Alert weeds (Pepper Trees, Briar Roses, Olives, Blue Periwinkle)

Recommended actions

- Low Priority for weed control
- However, woody weed management would be beneficial and may be easy to tackle in this section
- Opportunity to improve this section by further revegetation with local species.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia calamifolia	Wallowa			
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Acacia wattsiana	Dog Wattle			N
Austrostipa sp.	Spear-grass			
Callistemon rugulosus	Scarlet Bottlebrush			R
Convolvulus erubescens complex	Native Bindweed			
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus odorata	Peppermint Box			
Melaleuca lanceolata	Dryland Tea-tree			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Echium plantagineum	Salvation Jane			
*Hypericum perforatum	St John's Wort			
*Lactuca serriola	Prickly Lettuce			
*Olea europaea ssp. europaea	Olive			Y
*Oxalis pes-caprae	Soursob		C	Y
*Phalaris aquatica	Phalaris			Y
*Rosa rubiginosa	Sweet Briar		C	Y
*Scabiosa atropurpurea	Pincushion			
*Schinus molle	Pepper-tree			
*Solanum nigrum	Black Nightshade			
*Sonchus oleraceus	Common Sow-thistle			
*Trifolium angustifolium	Narrow-leaf Clover			
*Vinca major	Blue Periwinkle			Y
*Vulpia bromoides	Squirrel-tail Fescue			

Planted Exotic Native Species

Scientific Name	Common Name	AUS	SA	NL
Melaleuca sp (cult)				
Eucalyptus sp (WA)				
Grevillea sp (cult)				

15. Greenwood Park Rd to Finns Rd

Current situation

- 22 indigenous native species, 25 introduced weed species and 3 exotic native (planted) species were recorded in this section
- Good native species diversity, but mostly due to extensive revegetation by the Auburn community, including the Auburn Primary School (and Taylor's winery?)
- Also includes remnant native grassland species, including several species of native grasses, New Holland Daisies, Flax Lily and Pimelea
- High variety of weed species, including a stand of old Pepper Trees associated with a farm house – probably regarded as a feature of the local farming landscape
- Other Red Alert weeds include Briar Roses, Olives, Aleppo Pines, Horehound and Rice Millet

Recommended actions

- Low Priority for weed control
- However, woody weed management would be beneficial and may be easy to tackle in this section
- Opportunity to improve this section by further revegetation with local species
- Past revegetation efforts by the community could be acknowledged with signage.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia brachybotrya	Grey Mulga-bush			
Acacia calamifolia	Wallowa			
Acacia notabilis	Notable Wattle			
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Acacia retinodes var. retinodes	Wirilda			Q
Acacia spilleriana	Spiller's Wattle		V	K
Allocasuarina verticillata	Drooping Sheoak			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa sp. (Several)	Spear-grass			
Callitris gracilis	Southern Cypress Pine			
Convolvulus erubescens complex	Native Bindweed			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland South Australian Blue Gum			
Eucalyptus odorata	Peppermint Box			
Eutaxia microphylla	Common Eutaxia			
Melaleuca lanceolata	Dryland Tea-tree			
Pimelea glauca	Smooth Riceflower			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N
Vittadinia cuneata	Fuzzy New Holland Daisy			

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			

*Bromus diandrus	Great Brome			
*Bromus sp.	Brome			
*Cupressus macrocarpa	Monterey Cypress			
*Echium plantagineum	Salvation Jane			
*Lactuca serriola	Prickly Lettuce			
*Malus pumila	Apple			
*Malva arborea	Tree Mallow			
*Marrubium vulgare	Horehound		C	Y
*Olea europaea ssp. europaea	Olive			Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Piptatherum miliaceum	Rice Millet			
*Prunus dulcis	Almond			
*Prunus persica var. nectarina	Nectarine			
*Prunus sp.	Plum			
*Rapistrum rugosum ssp. rugosum	Turnip Weed			
*Rosa rubiginosa	Sweet Briar		C	Y
*Scabiosa atropurpurea	Pincushion			
*Schinus molle	Pepper-tree			
*Solanum nigrum	Black Nightshade			
*Sonchus oleraceus	Common Sow-thistle			
*Urtica urens	Small Nettle			
*Vitis vinifera	Grape Vine			

Planted Exotic Native Species

Scientific Name	**Common Name**	**AUS**	**SA**	**NL**
Acacia argyrophylla (Cult)	Silver Mulga-bush			R
Acacia glandulicarpa (Cult)	Hairy-pod Wattle	V	E	E
Eucalyptus cladocalyx (Cult)	Sugar Gum			

16. Finns Rd to Auburn (Horrock's Highway)

Current situation

- 20 indigenous native species, 22 introduced weed species and 5 exotic native (planted) species were recorded in this section
- The good native species diversity in this section is mostly due to extensive revegetation by the Auburn community, including Auburn Primary School, and the Clare and Gilbert Valleys Council
- The northern half of this section has some good patches of native grasses
- The entire section is very weedy except plantings close to Auburn, maintained by the Council
- A dense stand of Aleppo Pines close to Auburn is probably regarded by locals as a landscape feature, and provides shelter to users of the trail

- Other Red Alert weeds include Olives, Briar Roses, Fennel, Horehound & Pincushion.

Recommended actions

- Low priority for weed control
- However, a long-term program for removal of the Aleppo Pines and replacement with plantings of Native Pines and Drooping Sheoaks could be initiated, if the local community agrees
- One of the WA Eucalypt species is regenerating and may become a weed problem
- Further plantings could be done to extend and connect existing patches of revegetation.

Indigenous Native Species

Scientific Name	Common Name	AUS	SA	NL
Acacia acinacea	Wreath Wattle			U
Acacia calamifolia	Wallowa			
Acacia notabilis	Notable Wattle			
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Acacia wattsiana	Dog Wattle			N
Allocasuarina verticillata	Drooping Sheoak			
Austrostipa sp.	Spear-grass			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Callitris gracilis	Southern Cypress Pine			
Dianella revoluta var. revoluta	Black-anther Flax-lily			
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush			
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus odorata	Peppermint Box			
Eutaxia microphylla	Common Eutaxia			
Maireana brevifolia	Short-leaf Bluebush			
Melaleuca lanceolata	Dryland Tea-tree			
Pultenaea largiflorens	Twiggy Bush-pea			U
Rhagodia parabolica	Mealy Saltbush			
Senna artemisioides	Desert Senna			
Vittadinia blackii	Narrow-leaf New Holland Daisy			N

Introduced Weed Species

Scientific Name	Common Name	WONS	Declared	Red Alert
*Artemesia arborescens	Shrubby Wormwood			

*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Bromus diandrus	Great Brome			
*Crataegus monogyna	Hawthorn		C	Y
*Ficus carica	Edible Fig			
*Foeniculum vulgare	Fennel			
*Lolium rigidum	Wimmera Ryegrass			
*Malva arborea	Tree Mallow			
*Marrubium vulgare	Horehound		C	Y
*Olea europaea ssp. europaea	Olive			Y
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Prunus dulcis	Almond			
*Prunus persica var. nectarina	Nectarine			
*Prunus sp.	Plum			
*Pyrus communis	Pear			
*Rapistrum rugosum ssp. rugosum	Turnip Weed			
*Rosa rubiginosa	Sweet Briar		C	Y
*Salvia verbenaca var. verbenaca	Wild Sage			
*Scabiosa atropurpurea	Pincushion			
*Schinus molle	Pepper-tree			

Planted Exotic Native Species

Scientific Name	**Common Name**	**AUS**	**SA**	**NL**
Eremophila longifolia (Cult)	Weeping Emubush			
Eremophila sp (Cult)				
Eucalyptus sp (WA) (Cult)				
Acacia glandulicarpa (Cult)	Hairy-pod Wattle	V	E	E
Eucalyptus cladocalyx (Cult)	Sugar Gum			

Weed Management

A large variety of weeds are growing along the verge of the Riesling Trail include woody, herbaceous and grass weed species. Between Clare (Lennon Street) and Auburn (Horrock's Highway), 107 introduced weed species were recorded. A complete list of the weed species, including designations as Weeds of National Significance (WONS), Declared Weeds (under the SA NRM Act), and Red Alert environmental weeds, is included in Appendix 1.

Weeds of National Significance (WONS) are the species considered to be Australia's worst invasive weeds, with proven social, economic and environmental impact on a scale requiring national action to manage and reduce their damage. Thirty-two species are currently listed as WONS; eight of these species are growing along the Riesling Trail between Clare and Auburn. WONS weeds are a high priority for management and are usually a high priority for NRM funding programs. The complete list of Australian WONS is available at the Biosecurity SA website.

Weeds Declared under the SA NRM Act 2004 are considered a significant threat to primary production and natural resources in South Australia. They are a priority for control and landholders have legal responsibilities to manage them, according to their designation (e.g. control, contain, or restrict movement and sale). Some of South Australia's Declared weeds are also WONS species. The list of Declared plants is on the Biosecurity SA website: the list is currently under review.

Red Alert weeds are environmental weeds that readily invade intact bushland, spread rapidly and form dense stands, smothering understory vegetation and reducing native species diversity and abundance. Red Alert weeds are a high priority for control and management, to reduce their impacts on the condition and diversity of native vegetation and wildlife habitats. The Red Alert weed ratings in this report are based on the Bushland Condition Monitoring Manual for the Northern and Yorke Region, by J Pedler, S Croft and T Milne, Nature Conservation Society of SA, 2007.

Weed infestations along the Riesling Trail vary in their priority for control, depending on their level of impact on biodiversity. Many of the weed species recorded have relatively low impact on native vegetation or biodiversity values; hence they are a low priority for action. Others have major impacts on the condition and quality of native vegetation and wildlife habitats, or are new introductions at an early stage of infestation. These weeds are a high priority for control.

In some sections of the Trail, weeds are the dominant plants and provide food and habitat for native birds, lizards and invertebrates. Broad-scale removal of woody weeds should be avoided in these sections, to reduce the impact weed control on native fauna. Weed removal should be staged over several years, with associated revegetation of indigenous native plants, to ensure that important fauna habitat is replaced.

The weed management action plan in Appendix 2 outlines suitable control methods and time of control work for the high priority weeds identified by this survey. Some characteristics of the highest priority weeds for control are summarized in Appendix 3.

Recommended bushcare weed control methods are described in Appendix 4, and notes on controlling dense stands of weeds are given in Appendix 5.

Revegetation

Revegetation for Species Conservation
Two indigenous species with very restricted occurrence in the Clare Valley were noted as either not occurring along the Riesling Trail corridor, or only occurring in very small numbers – Native Pine and Silver Banksia. Both species occur on private land sites adjoining the Trail and it is suggested they be planted in small numbers, with Native Pines in Section 1 Lennon Street to Maynard road Clare; and Silver Banksia at Penwortham, in Section 8 or the adjoining Sections 7 and 9.

Revegetation Following Broad-scale Woody Weed Removal
Several areas have been recommended in this report for intensive, broad-scale woody weed removal. Areas once dominated by heavy infestations of Aleppo Pines, Radiata Pines, Olives, Montpellier Broom, Tree Lucerne and other woody weed species will rapidly regenerate with herbaceous and woody weeds if annual follow-up action such as removal of weed seedlings is not undertaken. Such sites will also need active regeneration of vegetative cover to help stabilize and protect them against soil erosion and to replace lost habitat for native birds, lizards and invertebrates.

It would be very difficult in these areas to re-create the natural grassy woodland vegetation with herbaceous understorey. Therefore it is suggested that revegetation with hardy, indigenous tree and shrub species be undertaken. A selection of hardy species recommended for revegetation at weed control sites is listed in the table below.

Community groups and local schools could assist the revegetation of these areas with tubestock plants. Some areas along the Trail may also be suitable for direct seeding. Advice should be sought from a specialist revegetation consultant on site preparation, planting density, appropriate planting and establishment methods, and maintenance regimes. Tubestock will need to be obtained from a specialist native plant nursery, revegetation contractor, community group or local plant propagator (e.g. Ian Roberts at Blyth, Trees for Life, Greening Australia, or Donovan's Earthcare). Seed for revegetation or direct seeding should be collected from within the Clare Valley area and obtained via specialist seed collectors.

Suggested Species for Revegetating Weed Control Sites

Scientific Name	Common Name	Growth Form
Acacia acinacea	Wreath Wattle	Slender, open shrub to 1.5m
Acacia continua	Thorn Wattle	Small open shrub to 1m
Acacia paradoxa	Kangaroo Thorn	Large, dense bush to 2.0m
Acacia pycnantha	Golden Wattle	Large shrub to small tree – 4 to 8m

Acacia retinodes	Wirilda (hill form)	Small tree to 6m
Acacia spilleriana	Round Leaf Mulga-bush (Auburn area only)	Large, dense bush to 2.0m+, drier sites
Acacia wattsiana	Dog Wattle	Large, dense bush to 2.0m +
Allocasuarina verticillata	Drooping Sheoak	7 to 10m
Austrodanthonia caespitosa	Common Wallaby-grass	Tussock to 0.25m, flowers to 0.4m
Austrostipa species (including A blackii, A elegantissima, A mollis)	Spear Grasses	Tussocks, flowers to 1.0m
Banksia marginata	Silver Banksia	Small tree to 5.0m
Bursaria spinosa	Sweet Bursaria	Medium, open shrub, 1.5m +
Callistemon rugulosus	Scarlet Bottlebrush	Large, dense bush to 2.0m +
Callitris gracilis	Native Pine	Slender tree in woodland situations, to 16m
Cymbopogon ambiguus	Lemon-grass	Tussock to 0.5m, flowers to 1.0m
Dichanthium sericeum	Silky Blue-grass	Tussock to 0.3m, flowers to 0.5m
Dodonaea viscosa ssp spatulata	Sticky Hop-bush	Large shrub to 2.0m
Eucalyptus leucoxylon ssp pruinosa	SA Blue Gum	Tree, 12m+
Eucalyptus odorata	Peppermint Box	Tree to 10m
Eutaxia microphylla var microphylla	Common Eutaxia (Bush Pea)	Small spreading bush to 0.5m
Hardenbergia violacea	Native Lilac	Medium shrub to 1.0m, or climber
Themeda triandra	Kangaroo Grass	Tussock, flowers to 1.5m

Appendix 1: Total Native Plant and Weed Species List

(a) Indigenous Native Species along the Riesling Trail, Clare to Auburn

Scientific Name	Common Name	AUS	SA	NL
Acacia acinacea	Wreath Wattle			U
Acacia brachybotrya	Grey Mulga-Bush			
Acacia calamifolia	Wallowa			
Acacia notabilis	Notable Wattle			
Acacia paradoxa	Kangaroo Thorn			
Acacia pycnantha	Golden Wattle			
Acacia retinodes var. retinodes	Wirilda			Q
Acacia spilleriana	Spiller's Wattle		V	K
Acacia wattsiana	Dog Wattle			
Acaena echinata	Sheep's Burr			
Allocasuarina verticillata	Drooping Sheoak			
Amyema miquelii	Box Mistletoe			
Arthropodium strictum	Common Vanilla-Lily			
Asperula conferta	Common Woodruff			
Astroloma humifusum	Cranberry Heath			
Atriplex semibaccata	Berry Saltbush			
Austrodanthonia sp.	Wallaby Grass			
Austrostipa eremophila	Rusty Spear-Grass			
Austrostipa mollis	Soft Spear-Grass			R
Austrostipa sp.	Spear-Grass			
Austrostipa sp. Tall (blackii?)	Spear-Grass			
Austrostipa sp. very tall	Spear Grass			
Banksia marginata	Silver Banksia			R
Bulbine bulbosa	Bulbine-Lily			
Bursaria spinosa ssp. spinosa	Sweet Bursaria			
Caesia calliantha	Blue Grass-Lily			
Callistemon rugulosus	Scarlet Bottlebrush			R
Callitris gracilis	Southern Cypress Pine			
Calocephalus citreus	Lemon Beauty-Heads			U
Calostemma purpureum	Pink Garland-Lily			
Carex sp.	Sedge			
Chrysocephalum apiculatum	Common Everlasting			
Chrysocephalum semipapposum	Clustered Everlasting			Q
Clematis microphylla var. microphylla	Old Man's Beard			
Convolvulus erubescens complex	Native Bindweed			
Convolvulus remotus	Grassy Bindweed			
Dianella longifolia var. grandis	Pale Flax-Lily		R	T
Dianella revoluta var. revoluta	Black-Anther Flax-Lily			
Dichanthium sericeum ssp. sericeum	Silky Blue-Grass			R
Distichlis distichophylla	Emu-Grass			
Dodonaea viscosa ssp. spatulata	Sticky Hop-Bush			

Scientific Name	Common Name	AUS	SA	NL
Epilobium billardierianum ssp. cinereum	Variable Willow-Herb			R
Eucalyptus camaldulensis var. camaldulensis	River Red Gum			
Eucalyptus leucoxylon ssp. pruinosa	Inland SA Blue Gum			
Eucalyptus odorata	Peppermint Box			
Eutaxia microphylla (prostrate form)	Common Eutaxia			
Eutaxia microphylla (shrub form)	Common Eutaxia			
Exocarpos cupressiformis	Native Cherry			U
Geranium retrorsum	Grassland Geranium			
Gonocarpus elatus	Hill Raspwort			
Goodenia blackiana	Native Primrose			R
Goodenia pinnatifida	Cut-Leaf Goodenia			
Haloragis 'lanceolate leaf' (aspera?)	Rough Raspwort			U
Hardenbergia violacea	Native Lilac			U
Juncus sp. 1 'small'	Rush			
Juncus sp. 2	Rush			
Kennedia prostrata	Scarlet Runner			
Lepidosperma curtisiae	Little Sword-Sedge			R
Leptorhynchos squamatus ssp. squamatus	Scaly Buttons			
Lissanthe strigosa ssp. subulata	Peach Heath			R
Lomandra densiflora	Soft Tussock Mat-Rush			
Lomandra multiflora ssp. dura	Hard Mat-Rush			
Luzula meridionalis	Common Wood-Rush			
Maireana brevifolia	Short-Leaf Bluebush			
Melaleuca lanceolata	Dryland Tea-Tree			
Phragmites australis	Common Reed			
Pimelea glauca	Smooth Riceflower			
Plantago varia complex	Native Plantain			
Poa labillardieri var. labillardieri	Common Tussock-Grass			
Pultenaea largiflorens	Twiggy Bush-Pea			U
Pultenaea pedunculata	Matted Bush-Pea			R
Ranunculus sp.	Buttercup			
Rhagodia parabolica	Mealy Saltbush			
Scaevola aemula	Fanflower			
Senna artemisioides	Desert Senna			
Stackhousia monogyna	Creamy Candles			
Themeda triandra	Kangaroo Grass			
Thysanotus patersonii	Twining Fringe-Lily			
Velleia arguta	Toothed Velleia			
Vittadinia blackii	Narrow-Leaf New Holland Daisy			
Vittadinia cuneata var. cuneata f. cuneata	Fuzzy New Holland Daisy			
Wahlenbergia communis	Tufted Bluebell			
Wahlenbergia luteola	Yellow-Wash Bluebell			
TOTALS	82 Indigenous Native Species	0	2	19

Species list compiled from FlorList 2007, by Roger Taplin

AUS = Listed as rare or threatened at National Level (EPBC Act 1999); **SA** = Listed as rare, vulnerable or endangered under the SA NPW Act; **NL** = Conservation status in the North Lofty Botanical region (R = rare; T = threatened; U = uncommon; K = needs further assessment; Q = uncertain)

(b) Introduced Weed Species along the Riesling Trail, Clare to Auburn

Scientific Name	Common Name	WONS	Decl	Red Alert
*Agapanthus	Agapanthus			
*Allium triqetrum	Onion-grass			
*Arctotheca calendula	Cape Weed			
*Arctotis stoechadifolia	Arctotis			Y
*Artemesia arborescens	Shrubby Wormwood			
*Asparagus asparagoides	Bridal Creeper	Y		Y
*Asphodelus fistulosus	Onion Weed		C	
*Avena barbata	Bearded Oat			
*Briza maxima	Large Quaking-Grass			
*Bromus diandrus	Great Brome			
*Bromus rigidus	Rigid Brome			
*Bromus sp.	Brome			
*Centaurea sp.	Centaury			
*Chamaecytisus palmensis	Tree Lucerne			Y
*Chrysanthemoides monilifera ssp. monilifera	Boneseed	Y		Y
*Convolvulus arvensis	Field Bindweed		C	
*Cotoneaster simonsii	Cotoneaster			
*Cotoneaster sp	Cotoneaster			
*Crataegus monogyna	Hawthorn		C	Y
*Cupressus macrocarpa	Monterey Cypress			
*Cupressus sempervirens	Candle Pine			
*Cydonia oblonga	Quince			
*Cynara cardunculus ssp. flavescens	Artichoke Thistle		C	Y
*Cynodon dactylon var. dactylon	Couch			
*Cytisus scoparius	English Broom	Y	C	Y
*Echium plantagineum	Salvation Jane			
*Ehrharta longiflora	Annual Veldt Grass			
*Erodium botrys	Long Heron's-Bill			
*Euphorbia sp	Euphorbia			
*Euphorbia terracina	False Caper			
*Felicia amelloides	Felicia Daisy			
*Ficus carica	Edible Fig			
*Foeniculum vulgare	Fennel			
*Fraxinus angustifolia ssp. angustifolia	Desert Ash			Y
*Freesia cultivar	Freesia			Y
*Fumaria sp	Fumitory			
*Galium tricornutum	Three-Horned Bedstraw			
*Gazania linearis	Gazania			Y

Scientific Name	Common Name	WONS	Decl	Red Alert
*Genista linifolia	Flax-Leaf Broom	Y		Y
*Genista monspessulana	Montpellier Broom	Y		Y
*Gleditsia triacanthos	Honeylocust			
*Hemerocallis cultivar	Day Lily			
*Hordeum hystrix	Mediterranean Barley-Grass			
*Hypericum perforatum	St John's Wort			
*Hypochaeris sp.	Cat's Ear			
*Iris germanica (Cult)	Bearded Iris			
*Lactuca serriola	Prickly Lettuce			
*Lagurus ovatus	Hare's Tail Grass			
*Lavandula stoechas	Topped Lavender			Y
*Lolium rigidum	Wimmera Ryegrass			
*Malus pumila	Apple			
*Malus sylvestris	Crab Apple			
*Malva arborea	Tree Mallow			
*Malva parviflora	Small-Flower Marshmallow			
*Marrubium vulgare	Horehound		C	Y
*Moraea flaccida	One-Leaf Cape Tulip		np	Y
*Nicotiana glauca	Tree Tobacco			
*Olea europaea ssp. europaea	Olive			Y
*Opuntia sp.	Prickly Pear	Y		
*Oxalis pes-caprae	Soursob		C	Y
*Oxalis purpurea	One-O'clock			
*Pelargonium hybrid	Garden Geranium			
*Phalaris aquatica	Phalaris			Y
*Pinus halepensis	Aleppo Pine		C	Y
*Pinus radiata	Radiata Pine			Y
*Piptatherum miliaceum	Rice Millet			Y
*Plantago lanceolata var. lanceolata	Ribwort			
*Populus nigra	Lombardy Poplar			
*Prunus cerasifera	Cherry-Plum			
*Prunus domestica ssp. domestica	Plum			
*Prunus dulcis	Almond			
*Prunus persica var. nectarina	Nectarine			
*Prunus persica var. persica	Peach			
*Prunus sp.	Plum			
*Pyrus communis	Pear			
*Quercus canariensis	Canary Island Oak			
*Quercus robur	English Oak			
*Raphanus raphanistrum	Wild Radish			
*Rapistrum rugosum ssp. rugosum	Turnip Weed			
*Retama raetam	White Weeping Broom			Y
*Rosa canina	Dog Rose		np	Y
*Rosa rubiginosa	Sweet Briar		C	Y
*Rubus sp.	Blackberry	Y	C	Y
*Rumex crispus	Curled Dock			

Scientific Name	Common Name	WONS	Decl	Red Alert
*Salvia verbenaca var. verbenaca	Wild Sage			
*Scabiosa atropurpurea	Pincushion			
*Schinus molle	Pepper-Tree			
*Scilla sp. (Cult)	Lily (Introduced Bluebell)			
*Crassulaceae species	Ornamental Succulent plants			
*Solanum elaeagnifolium	Silver-Leaf Nightshade		N	
*Solanum nigrum	Black Nightshade			
*Solidago canadensis	Golden Rod			
*Sonchus oleraceus	Common Sow-Thistle			
*Sparaxis tricolor	Tricolor Harlequin Flower			Y
*Thinopyrum elongatum	Tall Wheat-grass			Y
*Trifolium angustifolium	Narrow-Leaf Clover			
*Trifolium campestre	Hop Clover			
*Trifolium hirtum	Rose Clover			
*Ulex europaeus	Gorse	Y		Y
*Ulmus parvifolia	Chinese Elm			
*Urtica urens	Small Nettle			
*Verbascum virgatum	Twiggy Mullein			
*Vicia sativa ssp. sativa	Common Vetch			
*Vinca major	Blue Periwinkle			Y
*Vitis vinifera	Grape Vine			
*Vulpia bromoides	Squirrel-Tail Fescue			
*Vulpia myuros	Fescue			
*Watsonia meriana var. bulbillifera	Bulbil Watsonia		C	Y
TOTALS	107 species	8 species	14 species	29 species

WONS = Weeds of National Significance: high priority for control
Decl = Declared under the SA NRM Act 2004: control or notifiable & movement restricted, as designated (C=control required in part of the State; N = notifiable throughout the State; np = notifiable in part of the State; (list being reviewed)
Red Alert = species listed as Red Alert environmental weeds for Northern & Yorke NRM Region, (Pedlar, Croft & Milne, 2007, Nature Conservation Society of SA)

(c) Planted Exotic Native Species along the Riesling Trail, Clare to Auburn

Scientific Name	Common Name	AUS	SA	NL
Acacia argyrophylla (Cult)	Silver Mulga-Bush			R
Acacia baileyana (cult)	Cootamundra Wattle			
Acacia glandulicarpa (Cult)	Hairy-Pod Wattle	V	E	E
Acacia iteaphylla (cult)	Flinders Ranges Wattle		R	R
Acacia longifolia (cult)	Coastal Wattle			
Acacia mearnsii (Cult)	Black Wattle			

Callistemon sp (cult)	Bottlebrush			
Casuarina cunninghamiana (cult)	River Oak			
Casuarina sp (Cult)				
Eremophila longifolia (Cult)	Weeping Emubush			
Eremophila sp (Cult)	Emu Bush			
Eucalyptus citriodora (Cult)	Lemon-Scented Gum			
Eucalyptus cladocalyx (Cult)	Sugar Gum			
Eucalyptus sideroxylon (Cult)	Red Ironbark			
Eucalyptus various species, incl WA sp. (Cult)	Gum Trees			
Grevillea spp (Cult)				
Leptospermum sp (cult)	Tea-Tree			
Lomandra longifolia (Cult)	Spiny-head Mat-rush			
Melaleuca armillaris ssp armillaris (Cult)	Bracelet Honey-Myrtle			
Melaleuca spp (Cult)	Melaleuca			
Pittosporum angustifolium (Cult)	Native Apricot			
Westringia sp. (Cult)	Slender Westringia			

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NL = Conservation status in the North Lofty Botanical region (R = rare; T = threatened; U = uncommon; K = needs further assessment; Q = uncertain)

Appendix 2: Weed Management Action Plan

Weed Species	Control Method	Timing
Aleppo Pine & Radiata Pine	Cut at base Hand Pull or Grub	Autumn – Late spring Seedlings (as long as there has been sufficient rain to penetrate the soil)
Artichoke Thistle	Grub Spot Spray with selective herbicide Weed Brush	Spring when young before taproot thickens, removing as much of the tap root as possible Mid-spring before flower stem fully develops At rosette stage before flower stem is produced
Blackberry	Grub Spot Spray Cut & Swab	Small plants when soil is moist to enable removal of the tap root Spring – Summer Small infestations Spring – Summer
Boneseed	Cut & Swab Hand Pull	Autumn - Spring Autumn – Spring (as long as there has been sufficient rain to penetrate the soil)
Bridal Creeper	Biological Control Wipe Foliage Hand Dig	Winter - spray Rust Fungus spores on large patches Winter – before flowering begins. Wipe with herbicide using Tongs of Death or Gloves of Death Winter –before flowering. Dig up tuber mats, destroy whole plant
Bulbous plants - Bulbil Watsonia Freesias, Soursob, Tri-colour Harlequin Flower	Hand Dig Wipe Foliage Spot Spray	Winter – before flowering, for individual bulbs in very small patches Winter – before flowering begins. Wipe with herbicide using Tongs of Death or Gloves of Death Soursobs. Winter, just before flowering
Desert Ash	Hand Pull Cut & Swab Drill & Fill	Seedlings making sure all roots are removed. Early Autumn before leaves change colour as nutrients are being transported from the canopy to the roots Early Autumn before leaves change colour as nutrients are being transported from the canopy to the roots

Field Bindweed, Blue Periwinkle	Spot Spray	Winter, Spring & early Summer, during active growth
Gorse	Biological Control Hand Pull Cut & Swab	For large patches release Gorse Spider Mites supplied by NRM Officers Seedlings making sure all roots are removed. Spring – Summer
Hawthorn & Cotoneaster	Hand Pull Cut & Swab Drill & Fill	Seedlings and small plants making sure all roots are removed. Spring-early summer before fruiting, but avoid extended dry periods. Cut a few centimetres above crown, scrape down each side, apply herbicide to cut surface & scrapes Spring - Summer but avoid extended dry periods
Montpellier Broom, English Broom, White Weeping Broom, Flax-leaf Broom	Cut & Swab Hand Pull	Autumn – Late spring Seedlings. Autumn – Spring (as long as there has been sufficient rain to penetrate the soil)
Olive	Basal Bark Spray Drill & Fill Cut & Swab Hand Pull or Grub	During active growth - spring to early summer Year round – preferably during active growth Seedlings up to 1m, below the lignotuber Seedlings (as long as there has been sufficient rain to penetrate the soil) Seedlings up to 1m
One-leaf Cape Tulip	Tongs of Death	After first rains at the peak of germination. Most corms do not germinate each season. Follow up is needed for several years to exhaust all corms.
Phalaris	Slash & Spot Spray	Spring-Summer. Slash actively growing plants and spot spray the regrowth
Pincushion	Cut & Swab Hand Pull Weed Brush	Winter-Late Spring Winter (as long as there has been sufficient rain to penetrate the soil) At rosette stage before flower stalks emerge
St. Johns Wort	Cut & Swab Hand Pull	Winter-Late Spring Early Spring (as long as there has been sufficient rain to penetrate the soil)
Sweet Briar and Dog Rose	Grub Cut & Swab	Small plants, ensuring crown is removed Summer – Autumn before fruiting
Topped Lavender	Cut & Swab Hand Pull	Autumn - Spring Autumn – Spring, regenerating seedlings (as long as there has been sufficient rain to penetrate the soil)

Appendix 3: Weed Species Profiles

Weed Type	Species	Reproduction and dispersal methods
Woody	Aleppo Pine (**Pinus halepensis*) Monterey Pine (**Pinus radiata*)	Reproduce by seeds that are spread primarily by wind. Prolific seeders. Generally don't regrow from suckers.
	Blackberry (**Rubus* sp.)	Readily regenerates from root suckers and 'daughter plants' (where stems touch the ground and develop roots). Seeds are spread by foxes and birds, but generally have low viability; seedlings are very susceptible to shading and competition from other plants
	Desert Ash (**Fraxinus angustifolia*)	Regenerates readily from seeds that are dispersed by wind and water Plants re-shoot vigorously from the base if top growth is damaged
	Dog Rose (**Rosa canina)* Sweet Briar (**Rosa rubiginosa*)	Reproduce via seeds that remain viable up to four years. Seeds are dispersed by birds, foxes and flowing water.
	Hawthorn (**Crataegus monogyna*) & Cotoneaster (**Cotoneaster simonsii*)	Regenerates from seeds spread by birds. Bird ingested seed tends to have enhanced germination rates. Plants re-shoot vigorously from the base if top growth is damaged
	Montpellier Broom (**Genista monspessulana*) Flax-leaf Broom (*Genista linifolia*). Gorse (**Ulex europaeus*) Tree Lucerne (**Chamaecytisus palmensis*)	Prolific seed producers; ripe seed explosively dispersed up to three metres from parent plants. Seeds also spread by birds, ants, stock, water flow, vehicles, machinery, slashing, soil and garden refuse. Soil disturbance around plants stimulates mass germination. Seeds can remain dormant in the soil for up to 10 - 30 years.
	Olive (**Olea europaea* ssp. *europaea*)	Readily regenerates from the lignotuber and from seeds spread by birds and foxes
	Topped Lavender (**Lavandula stoechas*)	Reproduces from seeds dispersed by wind, water, birds, animals, soil particles/clods and on clothing. Can spread vegetatively when dislodged crowns come into contact with soil.
Bulbs	Bulbous Watsonia (**Watsonia meriana* var *bulbifera*), *Freesia* sp. , Soursobs (**Oxalis pes-caprae*) & Tri-coloured Harlequin Flower (**Sparaxis tricolor*)	Re-sprout and multiply from perennial bulbs, most regenerate prolifically from seeds or bulbils formed along flower stalks. Seeds spread by ants, water flow. Bulbs spread by machinery, dumping of garden waste. Form dense patches.
Creepers	Bridal Creeper (**Asparagus asparagoides*)	Mainly regenerates from root rhizomes, which have fleshy tubers that enable tolerance of low light, drought and saline water. Seed germinates readily and is spread by birds, rabbits and foxes, and by flowing water. Dry seed only viable for 3 years

	Field Bindweed (**Convolvulus arvensis*) Blue Periwinkle (**Vinca major*)	Spread by seeds and suckering. Form dense patches.
Herbaceous	Artichoke Thistle (**Cynara cardunculus* ssp. *flavescens*)	Reproduces by seed that is dispersed by water, wind, sheep, cattle, in mud, birds and mice.
	One-leaf Cape Tulip (**Moraea flaccida*)	Regenerates annually from corms. Produces masses of tiny seed that are dispersed with the remains of dried plants by wind.
	Pincushion (**Scabiosa atropurpurea*)	Reproduces by seed and regenerates from its large taproot if top growth is removed/cut.
	St. Johns Wort (**Hypericum perforatum*)	Readily regenerates from seeds (no pollination required) and suckering. The major method of long distance dispersal is via sticky seeds adhering to animal coats/hair. Extended drought may cause plant death.
Grasses	Phalaris (**Phalaris aquatica*)	Large perennial tussock. Reproduces by seed and rhizomes. Seed is dispersed by water, animals, machinery, slashing and in soil
	Rice Millet (**Piptatherum miliaceum*)	Large perennial tussock. Reproduces from seeds. Few seeds survive for more than three years

Appendix 4: Bushcare Weed Control Methods

It is recommended that all weed control undertaken in patches of remnant native vegetation follows minimum disturbance techniques including:-

- **Work from areas of less disturbed or good condition bush out towards more heavily infested areas**. This gives the native plants a chance to spread into naturally reclaimed areas.
- **Remove isolated or 'one off' weeds first**.
- **Keep disturbance to the soil and existing native plants to a minimum**. This reduces the risk of re-infestation by the original weed or other weed species
- **Avoid over-clearing**. Other weeds will readily replace removed weeds and over-clearing may also result in soil erosion (depending on the site).
- **Concentrate on vigorous high priority weeds**.
- **Follow up in subsequent years** to remove seedlings regenerating from the soil seed bank

The main methods available for minimum disturbance weed control are and Pulling, Grubbing, Spot Spraying, Cut and Swab, Drill and Fill, Wiping Foliage and Biological Control. An outline of each method follows.

Hand Pulling

Hand pulling can be used for woody weed seedlings and some herbaceous species that have shallow tap roots. Hand pull when the soil is moist, or at sites with open textured sandy or loam soils.

When hand pulling weeds, place your fingers (or feet if it is a larger seedling) around the base of the weed to minimise soil disturbance.

Grub

Used for weeds with a deep tap root, or those that break off when hand pulled. Making sure there is minimum disturbance to existing native plants and soil, and repair any disturbance as you go.

Spot Spray

Spot spraying is useful for large infestations of woody weed seedlings, herbs and grasses. Great care is needed to minimise the risk of off target spray damage to surrounding native species. Protect native plants by shielding with sheets of plastic, plastic bags, or upturned buckets.

Use Glyphosate mixed at 1part water to 10 parts chemical. A surfactant (to break down the surface of the leaves) and dye (to show what plants have been sprayed) should also be added at recommended rates.

Basal Bark Spray – Access:Diesel

New trials of basal bark spraying (by Creation Care Pty Ltd) with "Access" herbicide have shown this method to be very effective for control of Olives. Advantages include - easy to do, can be used where foliar spray and Drill and Fill can't be used, very low risk of off-target damage and quicker than other control methods. A 1:60 mix of "Access": Diesel has been found to control a large range of woody weed species. Garlon:Diesel

mix has also been used for basal bark spraying (e.g. African Olive control at Mount Annan Botanic Gardens).

Cut and Swab
This technique is useful for woody weeds and some herbaceous weeds.

The stem of the weed is cut horizontally and as close to the ground as possible, then herbicide is applied to the cut surface. Diagonal cuts through the stem can be made (using secateurs, hatchet, or saw depending on the circumference of the stem) to increase the surface area for the herbicide to penetrate.

Use Glyphosate mixed at 2 parts water to 1 part chemical, with dye added.

Drill and Fill
This method is suitable for large woody weeds and saplings with a base of approximately 4cm or more (large enough to drill at least 3 holes into).

Holes are drilled into the stem and filled with herbicide. The herbicide is absorbed throughout the whole plant, blocking the movement of nutrients and moisture between the roots and leaves, causing the death of the weed. It is more effective on most woody weeds than cut and swab as it minimises the occurrence of re-shooting.

For safety and access reasons some lower branches and dead material around the base of the weed may need to be removed first.

Holes are drilled approximately 2 -3cm apart, 2cm deep and at an angle of 45^{o} around the base of the stem. Herbicide solution is poured or squirted into the holes within 60 secs using a plastic chemical bottle, sauce bottle or other squeeze bottle with a long spout/tube. If the weed has multiple stems, one or two stems may need to be removed to allow holes to be drilled all round each stem. If more than one row of holes is to be drilled make sure the holes are staggered and are not in line with each other vertically.

If the dead plants are going to be cut down the treated plants need to be left standing for at least twelve months to ensure the herbicide has penetrated all the way to the roots, and the plants are definitely dead before they are cut down.

Use Glyphosate mixed at 7 parts water to 1 part chemical.

Wiping Foliage
There are two methods used to wipe chemical onto the foliage of plants.

Weed Brush
Used for herbaceous weeds with leaves that form a rosette i.e. salvation Jane, cats ears, and some thistles. The weed brush consists of a tube that holds the herbicide and a brush at the tip that releases the herbicide when it is wiped/dabbed onto the leaves.

Tongs of Death
Tongs of death are most suited to bulbous plants with long strap-like leaves. The tongs are either tea bag squeezer tongs or BBQ tongs with sponges tied to them. Herbicide is

applied to the sponges using a laboratory wash bottle. To apply herbicide to the weed, close the tongs onto the weed leaf at/near the base and drag them to the top.

Use Glyphosate mixed at 5 parts water to 1 part chemical, with dye added for both these methods.

Biological Control

Biological control entails the deliberate and planned use of pathogens or animal species to control the spread of invasive pest plant or animals. Introduced plants are usually controlled by pathogens or insects associated with the plant in its natural environment. The aim is not to eradicate the weed species but to reduce their competitive abilities so that desirable species are no longer threatened. A number of agents are usually employed for each weed species.

Biological control alone will not completely eradicate the weeds. A natural balance is reached between the weed and the agent. The level of control at which that balance is reached varies according to climate and land use.

There are biological control agents for:

- Gorse – spider mite that feeds on leaves
- Bridal Creeper - rust fungus can be sprayed onto plants by mixing with water. Is dispersed to other bridal creeper plants by wind.

Both of these biological control agents appear to work well on their target species once established.

Appendix 5: Controlling Dense stands of weeds

Weed management methods outlined in appendix 4 can also be employed in heavily infested areas of the Riesling Trail. The main difference is that the level of control necessary in these areas will entail extensive weed removal, and may involve extensive cutting, spraying and mechanical work. Such intensive work will bare-out and disturb the soil, opening up treated areas to erosion risk as well as further invasion and regeneration of weeds from the soil seed bank. Considerable effort will be required to control weeds in these densely infested areas, with dedicated follow-up to remove emerging seedlings.

The main difference is that all the weeds will be removed at one time and consequently more follow up will needed to stabilise and regenerate or revegetate the site. Major problems with large-scale weed removal include

- few natives plants present to fill the gap and replace the removed weeds;
- the large weed seed bank in the soil may take many years to exhaust; and
- weeds from surrounding areas will tend to colonise readily into treated areas.