

Draft Flora and Fauna Guarantee Action Statement

Wimmera Rice-flower *Pimelea spinescens* subsp. *pubiflora*

Description

The Wimmera Rice-flower *Pimelea spinescens* subsp. *pubiflora* Rye 1990 is a small native shrub 5-50cm high. The spine-tipped stems distinguish both the Wimmera and Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* from all other Rice-flower species.

The leaves are oval and are generally no bigger than 10 mm long x 3 mm wide. In contrast to most other grassland species, Wimmera Rice-flower typically blooms in mid winter. Between April and August, small creamy yellow flowers are produced abundantly in small heads at the ends of, and along the branches. The flowers are mostly unisexual, but both male and female flowers may be present in the one flower-head. Some plants however, appear to be wholly unisexual.

In mid to late spring the ovoid fruits develop. These are firm, dry, nut-like structures about 3 mm long. During the summer months the green or grey-green foliage may fade slightly or partially die back depending on the rainfall. However, the small green shrub is usually still conspicuous amongst the drier associated vegetation (DSE 2005).

Distribution

The Wimmera Rice-flower is one of two subspecies of Spiny Rice-flower (*Pimelea spinescens*), both of which are endemic to Victoria (Walsh and Entwisle 1996).

There are two known extant populations of Wimmera Rice-flower. One was discovered in 2005 and is located 8 km north of Natimuk on a roadside reserve (Lake Rd) in good quality grassland vegetation. The other population was discovered in 2007 and is located in the township of Minyip on a Crown Land allotment. Both populations fall within the Ecological Vegetation Class; Plains Savannah 826 (DSE 2004, 2008). These populations are 30 km apart.

There are five herbarium specimens held at the Royal Botanic Gardens, Melbourne for *Pimelea spinescens* subsp. *pubiflora* that were collected prior to its rediscovery in 2005 (Walsh *pers. comm.*). The localities of most of these collections are only vaguely indicated on the specimen's labels: two collected in 1890s from the 'Shire of Dimboola', one collected in the 1890s from 'the Wimmera' and one collected in 1901 from 'Borong' district. These locations cover many current local government areas including; Hindmarsh Shire, Horsham Rural City Council, Yarriambiack Shire, West Wimmera Shire, Northern Grampians Shire and Buloke Shire.

The fifth pre-2005 collection was made in 1986 by A.C. Beaglehole (Beaglehole 1987). This specimen was previously identified as *Pimelea serpyllifolia* and was collected from Minyip-Dimboola Rd, approximately 4 km west of the Yarriambiack Creek. This collection was reclassified by botanists at the Royal Botanic Gardens, Melbourne in 2007 (Walsh *pers. comm.*).

Habitat

The known populations of Wimmera Rice-flower occur in Plains Savannah (EVC 826). Both areas contain Buloke *Allocasaurina leuhmannii* as the over-storey species in the area. It is unclear how much these locations have been modified through previous management.

The Minyip population occurs on grey clay loam soils with a modified grass and herbaceous layer of reduced native diversity and includes annual and perennial weed species.

The Natimuk population occurs on reddish sandy loam with fairly abundant limestone nodules. It occurs in high quality native grassland. The location has over 50 native grassland species and is dominated by native spear-grasses and wallaby-grasses (*Austrostipa* and *Austrodanthonia* species respectively), with scattered shrubs of Sweet Bursaria *Bursaria spinosa* and Cassia *Senna artimisioides*, five flora species of state significance; and 23 flora species of regional significance (Biosis Research 2008).

Life history and ecology

The Spiny Rice-flower subspecies (*spinescens* and *pubiflora*) were thought to be dioecious (i.e. unisexual) however further field observations suggest that this may not be the case and that many plants appear to be monoecious (Pauline Rudolph *pers. comm.*). Plants are presumed to be like their closest relative (subspecies *spinescens*) in having a tap root

which extends to a depth of 1 m or more. They are also thought to be slow growing and long-lived plants reaching ages of up to 100 years (Mueck 2000). *Pimelea spinescens* subsp. *spinescens* has been observed to produce root suckers at some distance from the taproot and these were initially believed to have been seedlings (Reynolds *pers comm.*). It is likely that subsp. *pubiflora* is capable of similar growth.

The longevity of seed is unknown and germination/seedling survival appears to be an irregular event. It is possible that seedlings require consistent soil saturation in their first few years of establishment to survive long term. It is thought that this species relies on the substantial tap root during times of water stress, and that newly germinated plants need sufficient seasons of good rainfall to develop this system. Both populations appear to consist of relatively mature plants with only low levels of recruitment observed (Pauline Rudolph *pers. comm.*).

Conservation status

National conservation status

The Wimmera Rice-flower has been listed as “critically endangered” under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

Wimmera Rice-flower has been listed as “threatened” under the *Flora and Fauna Guarantee Act 1988*.

Wimmera Rice-flower is considered “endangered” in Victoria according to DSE’s *Advisory List of Rare or Threatened Plants in Victoria – 2005* (DSE 2005c).

Threats

As Wimmera Rice-flower was only rediscovered in late 2005, very little is known about its biology, ecology or management requirements. The rarity of Wimmera Rice-flower appears to be a direct result of habitat loss and changes to land use and management of its restricted grassland/woodland habitat. This habitat type is believed to have been abundant in the Wimmera landscape pre-1750 (DSE 2005b). Further loss of habitat quality and quantity is a threat to the survival of this species. As the only two known populations occur 30 km apart they are quite unlikely to share genetic material naturally and are therefore considered genetically isolated. The threats to this species are outlined in the table below.

<i>Standard threat</i>	<i>Source Of Threat</i>	<i>Explanation</i>
Competition	Invasion by environmental weeds	Vegetation at a roadside site near Natimuk include Horehound (<i>Marrumbium vulgare</i>) Burr medic (<i>Medicago polymorpha</i>) and Wild Sage (<i>Salvia verbenaca</i> var. <i>verbenaca</i>). The Minyip population is in a highly degraded area with Marshmallow (<i>Malva</i> spp.) being the major weed threat.
Genetic decline	Genetic decline - other	The isolation and small sizes of the two populations may lead to inbreeding depression. At Minyip one hundred and eighty eight plants are scattered across 10 ha. The Natimuk location has approximately 3500 plants clustered across a small area (250 m x 20 m). However new information indicates that many of these plants may not be individuals, but instead suckers and therefore clones.
Habitat damage or loss	Construction/maintenance - road, rail or utility	Both locations exist in areas where road maintenance or construction works may have a negative impact, should works be carried out where plants are present. The Natimuk population was seriously damaged through road maintenance activities in 2007. The Minyip population exists in an area where new works and pathway construction are proposed. Table drain maintenance, firebreak maintenance and utility installations are additional threats at both locations. These types of activities could crush plants and create soil disturbance giving potential weed species opportunity for colonisation.

Habitat damage or loss	Vegetation clearance	Vegetation clearance occurring as a result of road maintenance activities and fire break management has in the past resulted in removal of Wimmera Rice-flower plants at both locations.
Human disturbance	Vegetation control activities (incl. spraying, slashing and mowing)	Accidental damage has already occurred at Minyip as a result of slashing for fire prevention works by DSE Statewide Services Southwest). Off target chemical weed control is also a threat.
Pollution/toxins	Agricultural chemicals / effluent	Neighbouring agricultural use of herbicide has the potential to drift onto Wimmera Rice-flower plants, which may damage or even destroy some plants.
Surface water - quantity/regime	Weather - climate change	Climate change and the estiated decline in rainfall that is predicted for the Wimmera region could reduce establishment and persistence of seedlings, and survival of mature plants.

Important populations

<i>Location name</i>	<i>Land manager</i>	<i>Catchment</i>	<i>Bioregion</i>
Lake Road Natimuk	Horsham Rural City	Wimmera	Wimmera
Minyip Wimmera Rice-flower site	DSE Statewide Services	Wimmera	Wimmera

Past management actions

<i>Action</i>	<i>Result explanation</i>
Review conservation status.	The Wimmera Rice-flower was previously listed as "presumed extinct" under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> . In 2009 it was re-classified as "critically endangered".
Propagate seedlings and/or cuttings for reintroduction or reinforcement.	Attempts to date have failed to propagate this species via cuttings. In 2008 there was successful germination of a small amount of seed using smoke-water as a dormancy breaker.
Acquire baseline population data.	Both known populations have been thoroughly surveyed to obtain population numbers, identifying 188 plants identified at the Minyip location and approximately 3500 plants at the Lake Road (Natimuk) site.
Erect/maintain signs to restrict or discourage access.	“Significant roadside vegetation” signs have been erected along the Natimuk roadside population. Signs are ready for installation to restrict vehicle access to the Minyip population.
Manage the inappropriate use of pesticide/herbicides and non-target impacts.	A shielded spray unit was purchased for the committee of management of the Minyip location (Minyip Progress Committee Incorporated) through a Crown Land grant to reduce spray drift whilst managing onsite weeds. At the Natimuk population consultation has occurred with the adjacent landholder in relation to the effects of spray drift from the neighbouring paddock. Plants still occur adjacent to the fence.
Manage environmental weeds.	The recently purchased shielded spray unit will be the main method to control marshmallow, wild oats and other weeds on site. This work commenced in 2008.
Undertake research to identify key biological functions.	Monitoring quadrats were established at Natimuk in 2006 to record plant recruitment and loss and quantify sex ratio and distribution. All plants are

	being monitored at the Minyip location to measure growth rates, sex ratio distribution and plant recruitment.
Undertake periodic surveillance monitoring of populations.	Both locations are monitored in July/August. Each site is visited at least 4-6 times during the year to assess population health, threats and to collect seed.
Determine seed viability.	Seed has been collected from both populations and both sites produce viable seed. This species has specific requirements for germination and positive germination has been achieved with the use of a smoke-water treatment.
Collect reproductive material.	Seed was collected from the Minyip site during 2007 and 2008 and from the Natimuk population in 2005-08. A full collection of seed (4000) has been stored at the Millennium Seed Bank with the Royal Botanic Gardens in Melbourne and some sent to the seed bank at Wakehurst Place, Royal Botanic Gardens Kew (England).
Involve community groups and volunteers in recovery activities.	International student volunteers have been involved in searches for new populations in 2006 and 2008. More than 200 community volunteer hours were spent counting and sexing both populations in 2008.
Conduct survey to locate additional populations.	Numerous searches have been conducted during 2006-08 to locate further populations near to where the 1986 collection along the Dimboola-Minyip Rd was made. No new populations have yet been detected along this road.
Protect habitat from fire prevention activities.	The Minyip location was slashed for fuel load reduction in 2007, which resulted in many Wimmera Rice-flower plants being slashed. An assessment in 2008 showed that many have recovered well with fresh new growth. There has been no maintenance of the Natimuk roadside fire break for some time following consultation with the adjacent landholder. The old fire break area now supports plants of Wimmera Rice-flower.
Conduct survey to locate suitable habitat.	Community consultation and preliminary surveys have been conducted for suitable habitat through a desk top GIS EVC search for the locations of Plains Savannah remnants.
Assess habitat characteristics and/or condition.	A species list has been compiled for both site locations.
Conduct survey to determine abundance/extent.	DSE conducted surveys in 2008 identifying plant numbers and areas of occupancy for both sites. Horsham Rural City Council engaged Biosis Research to assess the effects of roadworks on the Natimuk population which occurred in June 2008 (Biosis Research 2008). This assessment confirmed DSE survey effort results.
Develop, publish and distribute educational, technical or publicity material and/or displays.	A fact sheet was developed (DSE 2005a) to promote community awareness of this species. Educational information has been displayed at various Garden Shows and Field Day events. Presentations have been given to various community and local government groups, focusing on roadside vegetation management.
Ensure records of species, communities and locations are documented on the relevant databases.	Updated information is submitted to ABC database, Flora Information System database and other relevant data bases regularly.
Liaise with government agencies.	Both land managers for each population, Horsham Rural City Council and DSE, have been informed of presence and significance of each population.

Conservation objectives

Long term objective

To ensure that the Wimmera Rice-flower can survive, flourish and retain its potential for evolutionary development in the wild.

Objectives of this Action Statement

- To secure populations or habitat from potentially incompatible land use or catastrophic loss.
- To improve the condition of habitat.
- To increase the number of populations and individuals.
- To increase knowledge of biology, ecology or management requirements.
- To increase community awareness and support.

Intended management actions

The intended management actions listed below are detailed in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

<i>Standard objective</i>	<i>Targets</i>	
To increase the number of populations and individuals.	<ul style="list-style-type: none"> • Reintroduction/translocation program implemented to increase the populations from two to five over the next five years. • These populations situated within the Wimmera CMA region to assist in bridging the geographical gap between the two extant populations. • At least 200 plants established at each location, within appropriate habitat. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Conduct survey to locate suitable habitat.	Locate three suitable sites over the next five years.	DSE Statewide Services – South West
Prepare a plan for reintroduction / translocation.	Prepare a plan and implementation program for the future reintroduction and translocation of plants into the Minyip site, into three suitable new locations.	DSE Statewide Services – South West
Collect reproductive material.	Collect seed and/or cuttings to be used for propagation for translocation projects and to establish/maintain a conservation <i>ex-situ</i> collection for this species with the Royal Botanic Gardens Melbourne.	DSE Statewide Services – South West, Royal Botanic Gardens Melbourne.
Propagate seedlings and/or cuttings for reintroduction or reinforcement.	Propagate seedlings and/or cuttings for the translocation/reintroduction program each year for three years. Seed used for this propagation is to be collected across a wide distribution of each site, from as many individuals as possible to ensure the best genetic make-up of seedlings.	Royal Botanic Gardens Melbourne
Establish and maintain a reintroduced / translocated population.	Reinforce the Minyip population with propagated plants. Establish three new populations of at least 200 plants each in appropriate habitat. Conduct direct seeding trials.	DSE Statewide Services – South West

<i>Standard objective</i>	<i>Targets</i>	
To improve condition of habitat.	<ul style="list-style-type: none"> • Measurable reduction in weed cover. • Measurable increase in seedling recruitment. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Apply ecological burning.	Add the Minyip population onto the DSE South West Fire Operations Plan for 2009/10. Apply a small ecological burn in autumn to control weeds, and monitor for seedling recruitment	DSE Statewide Services – South West

	of Wimmera Rice-flower post fire.	
Manage environmental weeds.	Control threats from pest plants at both locations. Use a shielded spray unit to protect Wimmera Rice-flower plants. Undertake hand removal of weeds along Lake Road roadside fire break.	DSE Statewide Services – South West

<i>Standard objective</i>	<i>Targets</i>	
To secure populations or habitat from potentially incompatible land use or catastrophic loss.	<ul style="list-style-type: none"> No avoidable loss or damage to populations or their habitat. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Incorporate actions to protect item into planning processes.	Encourage the Horsham Rural City Council and Yarriambiack Shire to enforce the Victorian Planning Provisions to protect important populations. Include important populations within Environmental Significance Overlays. Contribute to the development of the Horsham Roadside Vegetation Management Plan and ensure the Natimuk site is included.	Horsham Rural City, Yarriambiack Shire Council, DSE Statewide Services – South West
Negotiate a formal management agreement with a public authority.	Negotiate a MOU or Public Authority Management Agreement under the <i>Flora and Fauna Guarantee Act 1988</i> to regulate activities which might threaten important populations on public land.	Horsham Rural City, DSE Statewide Services – South West
Liaise with government agencies	Continually provide information on the location/condition and management requirements of important populations on public land to the relevant land managers, planning authorities and Wimmera Catchment Management Authority. Ensure all parties are aware of penalties under the EPBC act.	DSE Statewide Services – South West

<i>Standard objective</i>	<i>Targets</i>	
To increase knowledge of biology, ecology or management requirements.	<ul style="list-style-type: none"> Suitable habitat in vicinity of earlier records comprehensively searched. Demonstrable increase in knowledge of genetic variation and population dynamics. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Conduct survey to locate additional populations.	Royal Botanic Garden Herbarium records indicate that the species was more widely distributed in late 1890s and early 1900s. A population existed as recent as 1986 along the Minyip-Dimboola Road. Undertake surveys in suitable habitat in areas of historical records, during winter when plants are flowering.	DSE Statewide Services – South West
Undertake genetic research.	Assess genetic variation between and within both populations. Investigate the relationship between distance and relatedness of plants. Compare floral morphology between flower types and establish effective sex ratios within each population. Investigate the existence and nature of self-incompatibility syndromes.	Royal Botanic Gardens Melbourne
Undertake periodic surveillance monitoring of populations.	Using established monitoring protocols, measure population trends and responses against recovery actions. Collect demographic information including recruitment and mortality, growth rates, sex ratio distribution, timing of life history stages and morphological data.	DSE Statewide Services – South West

<i>Standard objective</i>	<i>Targets</i>	
To increase community awareness and support.	<ul style="list-style-type: none"> Measurable increase in community awareness and support, based on periodic sampling. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Involve community groups and volunteers in recovery activities.	Involve the Minyip Progress Committee in recovery actions for the Minyip population. Give presentations to and involve members of the community in surveys, monitoring and weed control. Involve local indigenous nurseries in propagation activities to assist the reintroduction/translocation program.	DSE Statewide Services – South West

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Personal Communications

- Neville Walsh, Senior Conservation Botanist, Royal Botanic Gardens, Melbourne.
- Pauline Rudolph, Threatened Species Project Officer, Department of Sustainability and Environment, Horsham.
- Deborah Reynolds, PhD student unpublished, Victoria University, Latrobe.