Department of
Sustainability and
Environment

National Recovery Plan for the Spiny Rice-flower *Pimelea spinescens* subspecies *spinescens*

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Australian Government

Victoria
The Place To Be

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This is a Recovery Plan prepared under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999, with the assistance of funding provided by the Australian Government.

This Recovery Plan has been developed with the involvement and cooperation of a range of stakeholders, but individual stakeholders have not necessarily committed to undertaking specific actions. The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the plan due to changes in knowledge.

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Summary

The Spiny Rice-flower *Pimelea spinescens* subspecies *spinescens* is listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 and Threatened under the Victorian *Flora and Fauna Guarantee Act* 1988 (Listed as *Pimelea spinescens*). The species is endemic to western Victoria, where it is known from about 20 wild populations containing up to 12,000 plants. Major threats include weed invasion, road works and grazing. This national Recovery Plan for the Spiny Rice-flower details the species' distribution and biology, conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Description

The Spiny Rice-flower *Pimelea spinescens* subspecies *spinescens* is a small spreading shrub growing to 30 cm in height, with partly herbaceous stems. It has narrow, green, hairless, oval-shaped leaves 2–10 mm long and 1–3 mm wide, that grow from spine-tipped stems. Up to 12 small, unisexual, hairless pale yellow flowers form the inflorescences. The flowers have four egg-shaped petal-like lobes, while four leaf-like, stalkless green bracts 3–7 mm long and 1.5–4 mm wide, grow at the base of the flower, which are often subtended by other smaller bracts. Female flowers have a style shorter than the ovary. Flowering occurs from April to August. Fruits are dry capsules approximately 3 mm long (description from Walsh & Entwisle 1996). Plants from more northerly populations appear more robust than those from southern areas. Glabrous flowers and stalks separate this subspecies from *Pimelea spinescens* subsp. *pubiflora*.

Plants are thought to be slow growing and may live as long as 100 years (Mueck 2000). Fairly frequent burning combined with good seasonal rainfall probably provides recruitment opportunities for the Spiny Rice-flower. This species presumably germinates in autumn or spring. Plants may also re-sprout after fire (Mueck 2000).

Distribution

The Spiny Rice-flower is endemic to Victoria, where it occurs in the central west of the State (Walsh & Entwisle 1996), in the Victorian Volcanic Plain, Victorian Midlands and Riverina IBRA Bioregions (DEH 2000).

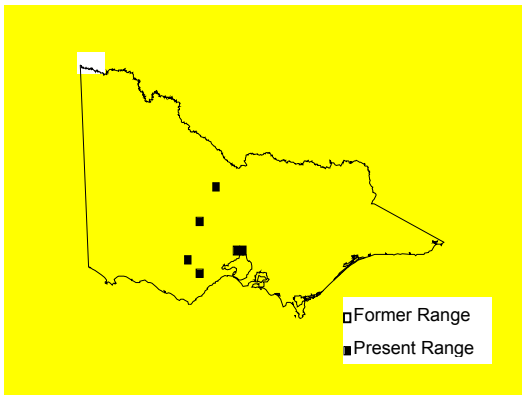

Figure 1. Distribution of *Pimelea spinescens* subsp. *spinescens* in Victoria

Maps showing the detailed distribution of the Spiny Rice-flower are available from the DSE Flora Information System (FIS). The FIS is a state-wide repository for flora grid and site distribution data, photographs and text descriptions. This information is available on request in a variety of formats for natural resource management purposes.

Habitat

The Spiny Rice-flower occurs in grassland or open shrubland on basalt-derived soils, usually comprising black or grey clays (Walsh & Entwisle 1996). Plants from more northerly populations occur on red clay complexes, while plants from southern populations occur on heavy grey-black clay loams. Topography is generally flat but populations may occur on slight rises or in slightly wettish depressions. Vegetation is often dominated by *Themeda triandra*, with *Austrostipa* spp. or *Austrodanthonia* spp. co-dominant. Associated species include *Acaena echinata*, *Calocephalus citreus*, *Chrysocephalum apiculatum*, *Eryngium ovinum*, *Plantago varia*, *Ptilotus erubescens*, *Schoenus apogon* and *Velleia paradoxa.* Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Population Information

Approximately 12,000 plants occur in about 20 populations, in the following locations:

Location	Comments
Road and rail sides	
Mt Mercer – Shelford Rd, Shelford	'High' total population at site in good condition.
Durham Ox – Rayburn Rd, Tandarra	Over 50 plants.
Crossman Rd **–** Pine Grove	Over 270 plants at a site with many other threatened flora species.
Jasper Road – Milloo	Over 100 plants.
McElwains Road – Dingee	Over 200 plants.
Hands Road – Dingee	Over 500 plants on high quality road reserve.
Meins Lane & Muckleford – Yapeen Rd, Yapeen	Over 300 plants at a site with several other threatened flora species.
Chatsworth Rd, Derinallum	Over 1000 plants on high-quality road reserve.
Bendigo–Tennyson Rd, Milloo	'Small' population.
un-named road, Wareek	Less than 50 plants.
Wimmera Highway, Marnoo	Population size unknown but apparently 'considerable'.
Val Matthews Road, Marnoo	Population size unknown but apparently 'considerable'.
Wingeel rail siding	Population size unknown.
Mitiamo rail siding	'Small' population.
Private Land	
Echuca	Several thousand plant on sympathetically managed farmland, where the site is lightly grazed.
Patho	Several hundred plants on farmland
Bacchus Marsh	Over 500 plants on several adjoining properties in Bences Road area.
Westpoint Business Park (formerly Laverton RAAF base)	Over 500 plants in three fenced reserves set aside on a commercial/industrial estate.
Other land	
Truganina Cemetery	Over 200 plants in small native grassland remnant containing several other threatened flora species, within an active cemetery. A Public Authority Management Agreement exists between the Cemetery Trust and DSE.
Lake Borrie Spit, Western Treatment Plant	Over 300 plants at a secure site (a RAMSAR wetland) that is actively managed for its biodiversity values by Melbourne Water.

Table 1. Location of *Pimelea spinescens* subsp. *spinescens* populations in Victoria

There are additional older records from several rail and road reserves in the Derrinallum, Pura Pura, Vite Vite, Nerrin Nerrin areas, plus several sites just to the west of Melbourne. These sites have not been surveyed for several years and it is not known if they still support populations or what condition they are in, but some of these sites may be of considerable size and importance. Surveys to assess the size and condition of any other remaining populations will be an important component of this Recovery Plan.

Threats

The Spiny Rice-flower was almost certainly much more widespread and abundant within the region where it currently occurs, but populations have been substantially fragmented and depleted historically by land clearance for settlement, industry and agriculture. This decline is almost certainly continuing, with almost all populations under major threat. Many populations consist of only a small number of plants, most are tiny patches of remnant habitat such as on roadsides and rail lines, and their long-term viability is doubtful without intensive site management. There is particular concern for the more robust 'northern form' of the subspecies, which has probably suffered a greater decline than the southern, basalt plain populations. The main threats to the Spiny Rice-flower are summarised as follows:

Weed invasion: The major threat facing all populations, with the perennial introduced grasses *Phalaris aquatica* and *Lophopyrum* species the worst weed threats. The risk is greatest in the small, heavily disturbed sites (eg. near Melbourne) where populations will almost certainly be lost without active weed and biomass management.

Road and rail maintenance: Many populations occur along roadsides and some rail reserves, and are at great risk from any maintenance works such as slashing, grading, clearing, widening and soil compaction by vehicle movement.

Grazing: Most populations are threatened by feral herbivores including rabbits and hares, while populations on private land have the additional pressure of grazing by domestic stock. However, light grazing regimes may be beneficial to the conservation of the Spiny Rice-flower by maintaining an open habitat structure and by reducing competition from weeds.

Inappropriate fire regimes: Prolonged lack of fire or analogous biomass reduction (eg. grazing, slashing) may threaten some populations, where plants are eventually crowded out by native grasses and weeds.

Changing land use: Several populations occur on land potentially subject to changing land use, such as from grazing to cropping, or from farming to industrial and residential uses, which could severely damage or destroy populations. The population in the Truganina Cemetery is under increased pressure to use the grounds area for burials.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Pimelea spinescens* subsp. *spinescens* in the wild and to increase the probability of important populations becoming self-sustaining in the long term.

Within the life span of this Recovery Plan, the **specific objectives** of recovery for *Pimelea spinescens* subsp. *spinescens* are to:

- Acquire accurate information for conservation status assessments.
- Identify habitat that is critical, common or potential.
- Ensure that all populations and their habitat are protected and managed appropriately.
- Manage threats to populations.
- Identify key biological functions
- Determine the growth rates and viability of populations.

- Build community support for conservation.

Program Implementation

The Recovery Plan will run for five years from the time of implementation and will be managed by the Department of Sustainability and Environment. A Threatened Flora Recovery Team, consisting of scientists, land managers and field naturalists will be established to oversee threatened flora recovery in Victoria in general. Technical, scientific, habitat management or education components of the Recovery Plan will be referred to specialist sub-committees on research, *in situ* management, community education and cultivation. Regional Recovery Teams will be responsible for preparing work plans and monitoring progress toward recovery.

Program Evaluation

The Recovery Team will be responsible for annual assessments of progress towards recovery. This Recovery Plan will be reviewed within five years of the date of adoption.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific objective 1		
Acquire accurate information for conservation status assessments		
1.1	Acquire baseline population data by conducting detailed field surveys including (a) identification of the area and extent of populations; (b) estimates of the number, size and structure of populations and (c) inference or estimation of population change. **Responsibility: DSE**	• Determination or update of conservation status for inclusion on state and national threatened species lists. • Target populations accurately mapped.
Specific objective 2		
Identify habitat that is critical, common or potential		
2.1	Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition. **Responsibility: DSE**	• Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. • Habitat critical to the survival of the species is mapped.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. **Responsibility: DSE**	• Predictive model for potential habitat developed and tested.
Specific objective 3		
Ensure that all populations and their habitat are legally protected		
3.1	Protect populations on public land. **Responsibility: DSE**	• Negotiate Public Authority Management Agreements under the *FFG Act* 1988 at Mt Mercer – Shelford Rd, Durham Ox – Rayburn Rd, 8 km WNW of Tandarra, and Chatsworth Rd, Derinallum sites.
3.2	Protect populations on private property. **Responsibility: DSE**	• Initiate private land management agreements in consultation with private land owners under the *Victorian Conservation Trust Act* 1972, *The Conservation, Forests and Lands Act* 1987 and the *Wildlife Act* 1975 Farm S of Echuca Sewerage Farm and farm in Patho, adjoining Murray Valley Hwy.

Action	Description	Performance Criteria
Specific objective 4		
Manage threats to populations		
4.1	Identify disturbance regimes to maintain habitat. **Responsibility: DSE**	• Preparation of management prescriptions for ecological burning at Laverton RAAF Grassland Reserve, Wingeel Rail Siding, Mitiamo Rail Siding and Mt Mercer – Shelford Rd sites. • Preparation of management prescriptions for ecological slashing or burning at Durham Ox – Rayburn Rd, 8 km WNW of Tandarra and Chatsworth Rd, Derinallum sites. • Preparation of management prescriptions for ecological grazing at Farm S of Echuca Sewerage Farm and farm in Patho, adjoining Murray Valley Hwy.
4.2	Control threats from pest plants, animals, and predators by preventing access, re-routing tracks, application of herbicide, hand removal of weeds, fencing sites and caging plants. **Responsibility: DSE/MW**	• Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at Laverton RAAF Grassland Reserve, Mt Mercer – Shelford Rd: Durham Ox – Rayburn Rd, 8 km WNW of Tandarra, Chatsworth Rd, Derinallum, Farm S of Echuca Sewerage Farm, Farm in Patho, adjoining Murray Valley Hwy, Wingeel Rail Siding and Mitiamo Rail Siding sites.
Specific objective 5		
Identify key biological functions		
5.1	Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment levels. **Responsibility: DSE**	• Seed bank/regenerative potential quantified for target populations.
5.2	Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration. **Responsibility: DSE**	• Stimuli for recruitment/regeneration identified. • Management strategies identified to maintain, enhance or restore processes fundamental to reproduction and survival.

Action	Description	Performance Criteria
Specific objective 6		
Determine the growth rates and viability of populations		
6.1	Measure population trends and responses against recovery actions by collecting demographic and morphological data **Responsibility: DSE**	• Techniques for monitoring developed and implemented. • Census data for target populations.
6.2	Collate, analyse and report on census data and compare with management histories. **Responsibility: DSE**	• Population growth rates determined and Population Viability Analysis completed for target populations.
Specific objective 7		
Build community support for conservation		
7.1	Identify opportunities for community involvement in the conservation of *Pimelea spinescens* subsp. *spinescens*. **Responsibility: DSE**	• Presentation(s) to community nature conservation groups.

Abbreviations

DSE	Department of Sustainability and Environment, Victoria
MW	Melbourne Water
PV	Parks Victoria
RBG	Royal Botanic Gardens, Melbourne

Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of *Pimelea spinescens* subsp. *spinescens*. The emphasis is on using knowledge to better implement *in situ* management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are primarily structured to (i) acquire baseline data, (ii) assess habitat condition including ecological and biological function, (iii) protect populations to maintain or improve population growth and (iv) to engage the community in recovery actions.

On-ground site management will aim to mitigate threatening processes and thereby ensure against extinction. Major threats requiring management include accidental destruction, competition from pest plants, inappropriate fire regimes and grazing by pest animals. A range of strategies will be necessary to alleviate these threats including weed control, fire management, fencing, and control of pest animals.

Broadscale protection measures applicable to all populations include legal protection of sites, habitat retention and liaison with land managers including private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations.

The Recovery Plan also advocates strategies to fill some of the major gaps in our knowledge to date. These include an understanding of the mechanisms underlying recruitment and regeneration. Successful *in situ* population management will be founded on understanding the relationships between *Pimelea spinescens* subsp. *spinescens* and associated flora, and its response to environmental processes. These are directly linked to biological function and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions.

In addition to the above, *ex situ* conservation measures will be required and will include seed storage and plant cultivation. Cultivating *ex situ* populations will also aim to increase the amount of seed available for reintroduction to sites.

Community participation in recovery actions will be sought, particularly in regard to recovery team membership and implementation of on-ground works.

To reduce the likelihood of unforseen development activities negatively impacting upon *Pimelea spinescens* subsp. *spinescens*, the threatened flora team should provide relevant information on its distribution, ecology and/or habitat to relevant land managers. Such increased awareness should allow new populations to be found if they exist, and improve the likelihood of adequate searches being made during environmental impact assessments.

Affected interests

Important populations of *Pimelea spinescens* subsp. *spinescens* fall under the jurisdiction of Westpoint Business Park (formerly Laverton RAAF base), Surf Coast Shire, Shire of Loddon, Shire of Campaspe, Shire of Corangamite, Golden Plains Shire, Shire of Mount Alexander, Wyndham City Council, City of Greater Geelong, Melbourne Water and 2 private landholders, who have been contacted and have approved the actions outlined in this Recovery Plan, subject to the availability of sufficient funding.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Pimelea spinescens* subsp. *spinescens* occurs will be advised, through the relevant DSE Regional Indigenous Facilitator, of the preparation of this Recovery Plan and invited to provide comments if so desired. Indigenous communities will be invited to be involved in the implementation of the Recovery Plan.

Benefits to other species/ecological communities

The Recovery Plan includes a number of potential biodiversity benefits for other species and vegetation communities in Victoria. Principally, this will be through the protection and management of habitat. The adoption of broad-scale management techniques and collection of baseline data will also benefit a number of other plant species growing in association with *Pimelea spinescens* subsp. *spinescens*, particularly those species with similar life forms and/or flowering responses.

The Recovery Plan will also provide an important public education role as threatened flora have the potential to act as 'flagship species' for highlighting broader nature conservation and biodiversity issues such as land clearing, grazing, weed invasions and habitat degradation.

Social and economic impacts

The implementation of this Recovery Plan is unlikely to cause significant adverse social and economic impacts.

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Priority, Feasibility and Estimated Costs of Recovery Actions

Action	*Description*	*Priority*	*Feasibility*	*Responsibility*	*Cost estimate*					
					Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	**Conservation status**									
1.2	Collect baseline data	1	100%	DSE	$10,000	$0	$0	$0	$0	**$10,000**
2	**Habitat requirements**									
2.1	Survey known habitat	1	100%	DSE	$20,000	$0	$0	$0	$0	**$20,000**
2.2	Identify, survey potential habitat	1	75%	DSE	$20,000	$0	$0	$0	$0	**$20,000**
3	**Legal protection of habitat**									
3.1	Protect public land habitat	1	75%	DSE	$0	$10,000	$10,000	$0	$0	**$20,000**
3.2	Protect private land habitat	1	50%	DSE	$0	$10,000	$10,000	$0	$0	**$20,000**
4	**Manage threats**									
4.1	Identify disturbance regimes	2	75%	DSE	$0	$10,000	$10,000	$0	$0	**$20,000**
4.2	Control threats	1	75%	DSE	$10,000	$8,000	$8,000	$4,000	$4,000	**$34,000**
5	**Identify key biol. functions**									
5.1	Evaluate reproductive status	3	75%	DSE	$0	$12,000	$12,000	$0	$0	**$24,000**
5.2	Seed germination	3	75%	DSE	$0	$10,000	$10,000	$0	$0	**$20,000**
6	**Growth rates, pop. viability**									
6.1	Conduct censusing	3	100%	DSE	$15,000	$15,000	$15,000	$15,000	$15,000	**$75,000**
6.2	Collate, analyse and report	3	100%	DSE	$1,000	$1,000	$1,000	$1,000	$5,000	**$9,000**
7	**Education, communication**									
7.1	Community extension	3	100%	DSE	$6,000	$6,000	$6,000	$6,000	$6,000	**$30,000**
				TOTAL	**$82,000**	**$82,000**	**$82,000**	**$26,000**	**$30,000**	**$302,000**