

Action Statement

Flora and Fauna Guarantee Act 1988 No. 132 (Revised in 2008)

Spiny Rice-flower

Pimelea spinescens subsp. *spinescens*

This Action Statement is based on a draft Recovery Plan prepared for this species by DSE under contract to the Australian Government Department of the Environment, Water, Heritage and the Arts.

Description

Spiny Rice-flower (*Pimelea spinescens* subsp. *spinescens*) is a stunted shrub, 5-50 cm in height. The stems may be partly herbaceous and are often tipped by a small spine (Walsh & Entwisle 1996). The leaves are narrow, green, hairless and oval-shaped, 2-10 mm long and 1-3 mm wide (Walsh & Entwisle 1996). Six to 12 pale yellow flowers form inflorescences which are often found on short branchlets (Walsh & Entwisle 1996). The flowers are unisexual and small with four egg-shaped petal-like lobes; they are not hairy or otherwise decorated. The style is shorter than the ovary in female flowers. Four leaf-like, stalk-less, green bracts, 3-7 mm long and 1.5-4 mm wide, grow at the base of the flower; these bracts are often subtended by other smaller bracts (Walsh & Entwisle 1996). The fruits are dry capsules approximately 3 mm long. Flowering occurs from April to August. This species can be distinguished from the Wimmera Rice-flower (*Pimelea spinescens* subsp. *pubiflora*) by its glabrous flowers and stalks. The Wimmera Rice-flower was presumed extinct until rediscovered in the Natimuk area in western Victoria in 2005.

Distribution

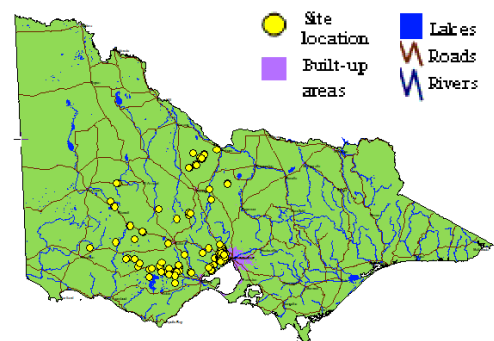
Pimelea spinescens subsp. *spinescens* is a Victorian endemic which occurs on basalt-derived soils west of Melbourne (Walsh & Entwisle 1996) across the central Victorian volcanic plains, and on alluvial soils across north west Victoria (B. Thomas *pers. comm.* 2006).

Habitat

Populations of *Pimelea spinescens* subsp. *spinescens* occur in grassland or open shrubland on basalt-derived soils, usually comprised of black



Spiny Rice-flower
(Photo: N. Stimson, Enviro Images)



Distribution in Victoria
(Flora Information System DSE 2007)

or grey clays (Walsh & Entwisle 1996). In north west Victoria, however, it occurs on alluvial soils. The McKenzie Road, Heathcote-Moora Road, Tait Hamilton Road, Sheedy's Lane and Browne's Road populations occur beneath an open tree canopy cover (J Thomas *pers. comm.*). Plants from more northerly populations appear more robust than those from southern areas and occur on red clay complexes. The Spiny Rice Flower has also been discovered in Grey Box/White Box woodlands near Marong and Toolleen. Site topography is generally flat, but populations may also occur on slight rises or in damp depressions. Vegetation is often dominated by Spear-grasses (*Austrostipa* spp.) or Wallaby-grasses (*Austrodanthonia* spp.), with Kangaroo Grass (*Themeda triandra*) co-dominant on the southern, basalt-derived soils. Associated species include Sheep's Burr (*Acaena echinata*), Lemon Beauty-heads (*Calocephalus citreus*), Common Everlasting (*Chrysocephalum apiculatum*), Blue Devils (*Eryngium ovinum*), Variable Plantain (*Plantago varia*), Hairy Tails (*Ptilotus erubescens*), Common Bog-sedge (*Schoenus apogon*) and Spur Velleia (*Velleia paradoxa*).

Life history and ecology

South of the Great Dividing Range, *Pimelea spinescens* subsp. *spinescens* inhabits *Themeda*-dominated communities which require fire for ongoing biomass reduction. Good seasons, in combination with fairly frequent burning, probably provide recruitment opportunities for *Pimelea spinescens* subsp. *spinescens*. This species presumably germinates in autumn or spring. Plants appear to re-sprout well after fire (Mueck 2000; J Thomas *pers. comm.*; C Grant *pers. comm.*). Little is known, however, about optimal burning requirements or pollinators. Plants are thought to be slow growing and may live as long as 100 years (Mueck 2000); most of the biomass is probably underground in the form of a stout, woody taproot.

Abundance

There are believed to be between 30,000 and 50,000 plants remaining in more than 120 known wild populations.

Important populations

Important populations necessary to the long term survival and recovery of *Pimelea spinescens* subsp. *spinescens* occur in the following locations:

Conservation reserves

- Blacks Creek Nature Conservation Reserve: This is one of the largest grassland reserves on the Victorian Volcanic Plain (234 ha). Only a small section of this reserve has been surveyed, but a

population of >500 plants has been located. Parks Victoria are reviewing management. The site has historically been used for low density sheep grazing, and this is likely to continue.

- Deep Lead Flora Reserve: small population (probably <20 plants) in high-quality vegetation. The site is atypical for the taxon (swampy Yellow Gum (*Eucalyptus leucoxylon*) forest), and is at or near the western limit of its range.

Other reserves

- Former Laverton RAAF Base grassland reserves: there are three private reserves containing a reasonable number (>500) of plants. These sites are currently managed specifically for botanical attributes. This situation, however, may change in the future.
- Truganina Cemetery: contains >300 plants and is an intact small native grassland within an active cemetery. Other nationally listed plants occur within the grassland. A Public Authority Management Agreement exists between the Cemetery Trust and DSE.
- Lake Borrie Spit, Western Treatment Plant: contains ~250 plants, and is a secure site (RAMSAR) which is actively managed for its biodiversity values by Melbourne Water.

Roadsides (VicRoads)

- Western Highway, Dobie: supports >350 plants on the roadside reserve which is adjacent to a rail reserve. A management plan has been written for this roadside, but the site is still threatened by weed invasion and accidental damage during road and rail maintenance works.

Roadsides (Shire)

- The largest known population of Spiny Rice-flower occurs on the Mt Mercer – Shelford Road in Golden Plains Shire. This site contains ~20,000 plants. The site is also important for its good condition and frequency of burning, but is dependent on continued beneficial management.
- Other roadside populations in Golden Plains Shire are Geggies Road (>2000 plants) Rokewood-Shelford Road (~500 plants) and Urches Road (~350 plants).
- Important roadside populations in the Colac-Otway Shire include the Pitfield-Cressy and Cressy-Shelford Roads.
- Roadsides in Corangamite Shire include Lower Darlington Road (~750 plants). All roadside populations are threatened by weed invasion,

inappropriate fire regimes and accidental works (e.g. ploughing).

- On the Northern Plains, there are numerous roadside populations of the more robust 'northern form' of the subspecies which has almost certainly declined more dramatically than southern, basalt plain populations. These occur in the Pine Grove, Baringhup, Dingee, Pia Vella and Guildford Plateau areas. All populations are threatened by weed invasion, accidental works (e.g. ploughing) and inappropriate grazing regimes.

Private Land

- Farm south of Echuca Sewerage Farm: thousands of plants in lightly grazed farmland.
- Farm in Patho, adjoining Murray Valley Hwy: ~200 plants.
- Farm in Pine Grove, south of Mitiamo - Echuca Road: 200-300 plants.
- Bence's Road, Bacchus Marsh: several properties containing >500 plants across the plateau. Sites are threatened by weed invasion and development.
- A small parcel of private land between the rail reserve and Hamilton Highway, east of Cressy supports ~1900 plants. The site has been fenced to prevent accidental damage and the current landholder is sympathetic to the values of the site. Weed invasion is the biggest threat.

Rail reserves

- Populations occur at Wingeel Rail Siding (~500 plants), Poorneet West Rail Reserve (~500 plants) and Gnarkeet Rail Reserve (>200 plants). Wingeel Rail Siding has been fenced to prevent accidental damage; the population is threatened by weed invasion. Poorneet and Gnarkeet Rail Reserves are threatened by weed invasion and accidental damage from rail works.
- Other smaller populations occur in rail reserves at Vite Vite, Pura Pura, Bannockburn, St Albans, Lara, Mitiamo, Manor and Little River but are under serious threat from weed invasion and accidental damage.

Conservation status

National conservation status

Pimelea spinescens subsp. *spinescens* is listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

Pimelea spinescens subsp. *spinescens* is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

It is considered vulnerable in Victoria according to DSE's *Advisory List of Rare or Threatened Plants in Victoria - 2005* (DSE 2005).

Potentially threatening processes

Inappropriate biomass reduction / fire regimes

Plants appear to resprout in response to fire. Lack of fire or analogous biomass reduction (e.g. grazing or slashing) may threaten populations.

Weed invasion

All known populations are threatened with weed invasion. The most problematic weeds include the perennial grasses Toowoomba Canary-grass (*Phalaris aquatica*) and Tall Wheat-grass (*Lophopyrum ponticum*). Both are long-lived and probably survive long periods without the disturbance (e.g. fire) that is required for general maintenance of the grassland communities inhabited by *Pimelea spinescens* subsp. *spinescens*. Lack of active management is likely to lead to expansion of weed invasion.

Road works

Roadworks are a particular threat to shire roadside populations. Plants can be damaged by machinery or inappropriate clearing of roadside vegetation.

All roadside populations in the north-west are threatened with spray drift which de-foliates (but not necessarily kills) the plants, thereby reducing their fitness.

Reservation status

Only three populations occur in conservation reserves: Blacks Creek Nature Conservation Reserve, Deep Lead Nature Conservation Reserve and Derrimut Grassland Reserve. Blacks Creek Nature Conservation Reserve supports at least 500 plants, while Derrimut Grassland Reserve and Deep Lead Nature Conservation Reserve are small populations of 20-30 plants. All other populations lack formal protection.

Inappropriate grazing regime

Pimelea spinescens subsp. *spinescens* rarely persists under frequent grazing (Foreman 2005). Low-level grazing regimes by introduced herbivores that currently maintain Spiny Rice-flower habitat, however, should only be altered in the light of sound ecological knowledge of the likely consequences for this species.

Conversion to cropping

Many populations occur in agricultural regions where conversion of land from grazing to cropping

has been common in recent years. Cropping would destroy whole populations.

Previous management action

- Weed control and ecological burning have been undertaken at a large number of sites in the north-west and south-west.
- Liaison has been undertaken with a variety of land managers and stakeholders, including the Commonwealth, local governments, rail managers, Catchment Management Authorities, the Country Fire Authority, cemetery trusts, Landcare groups and private landholders.
- Sites have been identified in precinct plans for Melbourne 2030 planning.
- Area and extent of populations has been mapped.
- Detailed monitoring has been undertaken at selected sites, surveillance monitoring at others.
- Surveys have been undertaken to determine new populations.
- Seed has been collected for the Millennium Seed Bank and to undertake germination trials.
- Royal Botanic Gardens has commenced studies of genetic diversity.
- Sites have been signposted and fenced.
- DSE brochure has been produced.
- Recovery Plan was published (Carter & Walsh 2006).
- Recovery Team was established in 2008.

Long term objective

To ensure that the *Pimelea spinescens* subsp. *spinescens* can survive, flourish and retain its potential for evolutionary development in the wild.

Specific Objectives, Actions and Targets

The intended management actions listed below are further elaborated 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.

Objective I To increase knowledge of biology, ecology and management requirements

Action	Targets	Responsible
1. Acquire baseline population data by conducting detailed field and desk top surveys including identification of the area and extent of the population; estimates of the number, size and structure of the population; and inference or estimation of population change.	<ul style="list-style-type: none"> ▪ Updated records on all state databases (Flora Information System, VROTPop and Herbarium). ▪ Important populations accurately mapped. 	DSE
2. Assess habitat characteristics and/or condition. Accurately survey known habitat, and collect and analyse floristic and environmental information relevant to community ecology and condition.	<ul style="list-style-type: none"> ▪ Ecological requirements identified for the completion of essential life history stages, recruitment and dispersal identified at known sites. ▪ Core habitat mapped. 	DSE
3. Conduct survey to locate suitable habitat. Identify and survey potential habitat, using ecological and bioclimatic information that may indicate habitat preference	<ul style="list-style-type: none"> ▪ Predictive model for potential habitat developed and tested. 	DSE
4. Identify disturbance regimes to maintain habitat or promote regeneration and recruitment.	<ul style="list-style-type: none"> ▪ Management prescriptions prepared for all important populations, in consultation with land managers. 	DSE

5. Undertake research to identify key biological functions. Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity, and recruitment levels by conducting field based experimental trials. Identify pollinators. Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli. Undertake studies to determine levels of genetic variation in a range of populations.	<ul style="list-style-type: none"> ▪ Seed bank/regenerative potential quantified for target populations. ▪ Pollinator(s) identified. ▪ Stimuli for recruitment/regeneration identified. ▪ Management strategies identified to maintain, enhance or restore regenerative processes fundamental to reproduction and survival. ▪ Levels of genetic variation identified. 	DSE
6. Undertake research into management requirements. Determine techniques for successful translocation.	<ul style="list-style-type: none"> ▪ Translocation techniques determined. 	DSE
7. Analyse population trends. Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data. Collate, analyse and report on census data and compare with management histories.	<ul style="list-style-type: none"> ▪ Techniques for monitoring developed and implemented. ▪ Census data for target populations. ▪ Population growth rates determined. ▪ Population Viability Analysis completed for targeted populations. 	DSE

Objective II To secure populations or habitat from potentially incompatible land use or catastrophic loss.

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
8. Negotiate co-operative management agreements with private landholders. Negotiate voluntary conservation agreements with private landowners with important populations on their land.	<ul style="list-style-type: none"> ▪ All landowners with important populations approached regarding voluntary conservation agreements. 	DSE, Trust for Nature
9. Negotiate voluntary acquisition or exchange of land. Explore opportunities for strategic land purchase for addition to the National Reserve System as properties become available.	<ul style="list-style-type: none"> ▪ Landowners of properties with high conservation values approached 	DSE
10. Erect/maintain signs to restrict or discourage access. Control accidental destruction by installing appropriate signage.	<ul style="list-style-type: none"> ▪ Signage installed at sites likely to be subject to disturbance through utility works (e.g. roadsides and rail reserves) 	DSE
11. Liaise with government agencies. Provide information on the location and management requirements of important populations on public land to the relevant land managers and planning authorities.	<ul style="list-style-type: none"> ▪ All relevant authorities and public land managers are aware of the species and its management needs. 	DSE
12. Provide information and advice to local government authorities for inclusion in planning processes. Encourage shires to enforce the Victorian Planning Provisions to protect important populations.	<ul style="list-style-type: none"> ▪ Important populations included within Environmental Significance Overlays. 	DSE
13. Incorporate actions to protect item into planning processes. Apply the Victorian Planning Provisions to protect important populations on private land.	<ul style="list-style-type: none"> ▪ All important populations on private land remain extant and undamaged. 	DSE

14. Conduct enforcement activities. Use the protected flora controls under the Flora and Fauna Guarantee Act 1988 to regulate activities which might threaten important populations on public land.	<ul style="list-style-type: none"> All important populations on public land remain extant and undamaged. 	DSE
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Objective III To improve the condition of habitat

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
15. Manage environmental weeds. Control threats from pest plants using broad scale application of herbicide or hand removal of weeds.	<ul style="list-style-type: none"> Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at key sites. 	DSE, land managers
16. Control introduced animals. Control threats from pest animals.	<ul style="list-style-type: none"> Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at key sites. 	DSE, land managers

Objective IV To increase the number of populations or individuals

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
17. Store reproductive material. Store seed collected from salvaged and other populations for translocation and augmentation.	<ul style="list-style-type: none"> Long-term storage facility identified. Seed from target populations in storage. 	DSE, Royal Botanic Gardens
18. Determine seed viability.	<ul style="list-style-type: none"> Seed viability determined. 	Royal Botanic Gardens
19. Identify potential sites for reintroduction / translocation. Identify sites for possible salvage and translocation. Select and evaluate sites that are ecologically and biologically suitable, have secure land tenure and are managed appropriately.	<ul style="list-style-type: none"> Criteria for site suitability identified and site/s selected. 	DSE, Recovery Team
20. Establish and maintain a reintroduced / translocated population. If salvage is undertaken, prepare sites to achieve maximum survival of plants / germination of seed. Maintain and monitor translocated plants. Undertake population augmentation as needed.	<ul style="list-style-type: none"> Successful direct seeding and translocation techniques developed. Measurable increase in population size at selected sites. 	DSE, Recovery Team

Objective V To increase community awareness and support

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
21. Involve community groups and volunteers in recovery activities.	<ul style="list-style-type: none"> Opportunities for involvement identified, promoted and supported. 	DSE

References

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