

National Recovery Plan for Williamson's Bush Pea *Pultenaea williamsoniana*

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Australian Government

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Summary

Williamson's Bush Pea *Pultenaea williamsoniana* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. The species is endemic to the Grampians region of western Victoria, where there are six populations containing about 1,000 plants. This national Recovery Plan for *P. williamsoniana* details the species' distribution and biology, conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Description

Williamson's Bush Pea *Pultenaea williamsoniana* is a slender shrub growing to 3 m tall, with terete stems covered with white hairs. Leaves are alternate, hairy, narrowly cylindrical tapering to a fine spine, to 15 mm x 0.5 mm, stipules to 7 mm long, the margins tightly rolled upwards and obscuring the upper surface. The typical yellow and red 'bush pea' flowers are about 10 mm wide, and appear in October. Fruit is an ovoid, sparsely hairy pod (description from Walsh & Entwisle 1996).

There have been no specific ecological studies of *Pultenaea williamsoniana*. This species is likely to be an obligate seeder, recruiting after fire and germinating in response to high heat, as demonstrated for other hard-seeded *Pultenaea* (Read *et al.* 2000). Seedling recruitment was observed after a recent fire at the 'Pohlner Rd and Fire Break' site (O. Carter and J. Downe pers obs.). Populations tend to be most abundant close to roads, although it is not clear if this relates to some ecological preference such as increased light availability or disturbance regime, or is purely coincidental. From a distance, this species may resemble several other species of Fabaceae (bush peas) and thus may have been overlooked in areas away from roads.

Distribution

Pultenaea williamsoniana is endemic to Victoria, where it is apparently confined to the northern Grampians, between Mt Zero and Halls Gap (Walsh & Entwisle 1996), in the Victorian Midlands IBRA Bioregion (DEH 2000).

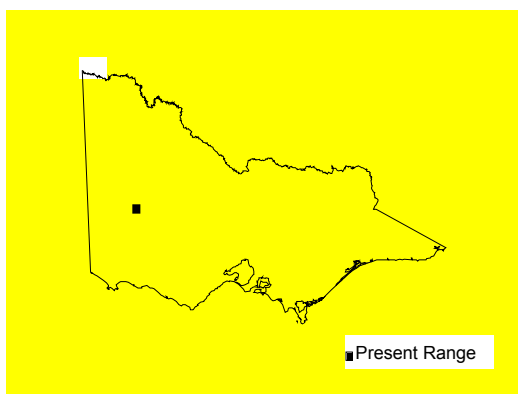


Figure 1. Distribution of *Pultenaea williamsoniana* in Victoria

Maps showing the detailed distribution of *P. williamsoniana* are available from the Department of Sustainability and Environment Flora Information System (DSE-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.

Population Information

Pultenaea williamsoniana is known from six populations containing about 1,000 plants. All populations occur within the Grampians National Park, at the following locations:

1. Pohlner Rd & Fire break (north of Copper Mine Track): about 100 plants.
2. Hollow Mountain (at base of Barc Cliff): about 10 plants.
3. Copper Mine Track (south east of Golton Gorge Picnic area): several hundred plants.
4. Wartook area: unknown population size, not seen since 1997.
5. West of Lake Wartook: unknown population size, not seen since 2000.
6. Halls Gap area: unknown population size, not seen since 2000.

Habitat

Pultenaea williamsoniana occurs in sandy soil on rocky slopes, with associated overstorey species include *Callitris rhomboidea*, *Eucalyptus baxteri*, *Eucalyptus goniocalyx*, *Eucalyptus arenacea*, *Eucalyptus obliqua* and *Eucalyptus cypellocarpa*, while heathy shrubs including *Thryptomene calycina*, *Hibbertia riparia* and *Calytrix alpestris* dominate substrata (Walsh & Entwisle 1996). Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

Pultenaea williamsoniana is known only from a limited area in western Victoria. As there is no information on past distribution or abundance, and no evidence of any declines in existing populations, it is not possible to determine if the species has suffered any decline in range and/or abundance. Threats are generally rated as low, although with the extremely limited distribution and low numbers of plants, the risk from stochastic events is probably high. Main threats are summarised as follows:

Inappropriate fire regimes: As with many species of Fabaceae, this species is likely to germinate in response to fire. Fire frequency is important, for plants to have time to mature and set seed, and also before populations become senescent and die out.

Visitor pressure: There is some risk of accidental physical disturbance and trampling at the Hollow Mountain population, especially where rock climbers descend.

Road works: Populations tend to occur within 20 m or so of a road, and often spread over hundreds of metres (O. Carter and J. Downe pers. obs.). Given the numbers of plants close to roads and tracks, maintenance or upgrade works such as clearing of drainage lines, slashing or track widening can physically damage plants.

Cinnamon Fungus *Phytophthora cinnamomi*: Cinnamon Fungus is present near the Hollow Mountain population, although its effect on the species is unknown. Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*) is listed under the EPBC Act as a Key Threatening Process.

Weed invasion: *Acacia longifolia* subspecies *sophorae* (Coast Wattle) is invading part of at least one population. Roadside populations are also susceptible to weed invasion as seeds dislodge from vehicle tyres and walkers' shoes.

Grazing: The effect of native herbivore grazing on seedling mortality is unknown.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Pultenaea williamsoniana* 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 *Pultenaea williamsoniana* 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 surveys including (a) identification of the area and extent of populations; (b) estimates of the number, size and structure of populations and (c) estimation of population change. Responsibility: DSE | <ul style="list-style-type: none"> • Determination or update of conservation status for inclusion on state and national threatened species lists. • Determine habitat critical to the survival of the species and important populations are 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 | <ul style="list-style-type: none"> • Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. • Critical habitat mapped. |
| 2.2 | Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. Responsibility: DSE | <ul style="list-style-type: none"> • Sites of potential habitat identified and surveyed. |
| Specific objective 3 | | |
| Manage threats to populations | | |
| 3.1 | Identify disturbance regimes to maintain habitat. Responsibility: DSE, PV | <ul style="list-style-type: none"> • Preparation of management prescriptions for ecological burning for all population sites based on the vital attributes of this species. |
| 3.2 | Control threats from pest plants, predation, disturbance (park visitors and animals) and park management activities (road maintenance, fire management etc.) by implementing appropriate methods of weed control (no broad scale spraying), re-routing tracks and limiting access (fencing), and erecting appropriate signage Responsibility: PV | <ul style="list-style-type: none"> • Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at Pohlner Rd & Fire break, Hollow Mountain Picnic Ground and Copper Mine Track. • Install appropriate signage at Pohlner Rd & Fire break, Hollow Mountain Picnic Ground, and Copper Mine Track sites. |

| Action | Description | Performance Criteria |
|---|--|--|
| Specific objective 4 | | |
| Identify key biological functions | | |
| 4.1 | Evaluate current reproductive/regenerative status, seed bank status, by determining longevity, fecundity and recruitment levels. Responsibility: DSE | <ul style="list-style-type: none"> Seed bank/regenerative potential quantified for targeted populations. |
| 4.2 | Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration. Responsibility: DSE | <ul style="list-style-type: none"> Stimuli for recruitment/regeneration identified. Management strategies identified to maintain, enhance or restore regenerative processes. |
| Specific objective 5 | | |
| Determine the growth rates and viability of populations | | |
| 5.1 | Measure population trends and responses against recovery actions by collecting information including recruitment, mortality, life history and morphological data. Responsibility: DSE | <ul style="list-style-type: none"> Techniques for monitoring developed and implemented. Collection of census data including recruitment and seedling mortality at the recently burnt Copper Mine Track site. |
| 5.2 | Collate, analyse and report on census data and compare with management histories. Responsibility: DSE | <ul style="list-style-type: none"> Population growth rates determined and Population Viability Analysis completed for targeted populations. |
| Specific objective 6 | | |
| Establish populations in cultivation / Establish seed bank | | |
| 6.1 | Establish cultivated plants <i>ex situ</i> for inclusion in living collections to safeguard against any unforeseen destruction of wild populations. Responsibility: DSE | <ul style="list-style-type: none"> Development of effective propagation and cultivation techniques. At least 10 mature plants in cultivation. |
| 6.2 | Establish a seed bank and determine seed viability. Responsibility: DSE | <ul style="list-style-type: none"> Seed from important populations in long term storage. Long-term storage facility identified. |
| Specific objective 7 | | |
| Build community support for conservation | | |
| 7.1 | Identify opportunities for community involvement in conservation of <i>Pultenaea williamsoniana</i> . Responsibility: DSE | <ul style="list-style-type: none"> Presentations to community nature conservation groups. |

Abbreviations: DSE - Department of Sustainability and Environment; 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 *Pultenaea williamsoniana*. 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 *Pultenaea williamsoniana* 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.

Affected interests

All known populations of *P. williamsoniana* occur in the Grampians National Park, which is managed by Parks Victoria, who have approved the actions as outlined in this Recovery Plan, subject to the availability of sufficient funding.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *P. williamsoniana* 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 *P. williamsoniana*, 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, as all populations occur within a national park, where management for biodiversity conservation is already a high priority. Any protection measures required will have negligible impact on current recreational and commercial activities occurring in the park.

Acknowledgments

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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 | \$5,000 | \$0 | \$0 | \$0 | \$0 | \$5,000 |
| 2 | Habitat requirements | | | | | | | | | |
| 2.1 | Survey known habitat | 2 | 100% | DSE | \$10,000 | \$0 | \$0 | \$0 | \$0 | \$10,000 |
| 2.2 | Identify, survey potential habitat | 1 | 75% | DSE | \$10,000 | \$0 | \$0 | \$0 | \$0 | \$10,000 |
| 3 | Manage threats | | | | | | | | | |
| 3.1 | Identify disturbance regimes | 1 | 75% | DSE, PV | \$0 | \$8,000 | \$0 | \$0 | \$0 | \$8,000 |
| 3.2 | Control threats | 1 | 75% | PV | \$10,000 | \$10,000 | \$6,000 | \$2,000 | \$2,000 | \$30,000 |
| 4 | Identify key biol. functions | | | | | | | | | |
| 4.1 | Evaluate reproductive status | 3 | 75% | DSE | \$0 | \$12,000 | \$12,000 | \$0 | \$0 | \$24,000 |
| 4.2 | Seed germination | 3 | 75% | DSE | \$0 | \$10,000 | \$10,000 | \$0 | \$0 | \$20,000 |
| 5 | Growth rates, pop. viability | | | | | | | | | |
| 5.1 | Conduct censusing | 3 | 100% | DSE | \$15,000 | \$15,000 | \$15,000 | \$15,000 | \$15,000 | \$75,000 |
| 5.2 | Collate, analyse and report | 3 | 100% | DSE | \$1,000 | \$1,000 | \$1,000 | \$1,000 | \$5,000 | \$9,000 |
| 6 | Establish pops. in cultivation | | | | | | | | | |
| 6.1 | Establish cultivated plants | 3 | 50% | DSE | \$0 | \$6,000 | \$6,000 | \$6,000 | \$6,000 | \$24,000 |
| 6.2 | Establish a seed bank | 3 | 50% | DSE | \$0 | \$4,000 | \$4,000 | \$4,000 | \$4,000 | \$16,000 |
| 7 | Education, communication | | | | | | | | | |
| 7.1 | Community extension | 3 | 100% | DSE | \$6,000 | \$6,000 | \$6,000 | \$6,000 | \$6,000 | \$30,000 |
| TOTALS | | | | | \$57,000 | \$72,000 | \$60,000 | \$34,000 | \$38,000 | \$261,000 |