Department of
Sustainability and
Environment

National Recovery Plan for the Fern-leaf Baeckea *Babingtonia crenulata*

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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 Fern-leaf Baekea *Babingtonia crenulata* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999, and is listed as Threatened under the Victorian *Flora and Fauna Guarantee Act* 1988. The species is endemic to a small area in north-eastern Victoria, where there are currently between 220 and 1000 plants occurring in five wild populations. Major threats to populations include weed invasion and altered fire regimes. This national Recovery Plan for *B. crenulata* 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 Fern-leaf Baekea *Babingtonia crenulata* (formerly *Baeckea crenatifolia*) is an erect myrtaceous shrub growing to 3 m tall. It has small, ovate or round blunt-tipped, hairless leaves, to 7 x 5 mm, with crenate margins. Flowers are white (rarely pale pink), to 8 mm wide, in a branched umbel in leaf axils. Flowers appear from October through to March and consist of a cup-shaped base with five round petals, a ring of 10-15 stamens and a central style. The fruit is a cup-shaped papery capsule to 3 mm wide, containing small, dry seeds (Bean 1997; DSE Flora Information System-FIS; Walsh & Entwisle 1996). *Babingtonia crenulata* may regenerate after fire, as has been demonstrated in other closely related *Baeckea* species, however the riparian habitat of many individuals of the species, suggest a relatively non-fire prone setting. Fires in January 2003 in Mt Buffalo National Park are likely to have affected most populations of *Babingtonia crenulata*, and provide an opportunity to determine post-fire response. Some seedling recruitment was observed shortly after the fires (G. Johnson DSE pers. comm.). It is possible that other types of localised disturbance such as flood or frost heave may be required for germination.

Babingtonia crenulata is closely related to *Babingtonia tozerensis*, which occurs in Cape York Peninsula in northern Queensland (Bean 1997). *Babingtonia crenulata* differs in having smaller leaves, crenulate leaf margins and compound sepals (Bean 1997).

Distribution

Babingtonia crenulata is endemic to Victoria, where it is currently restricted to rocky streamsides on the lower slopes of Mt Buffalo in the north-east of the state (Walsh & Entwisle 1996), which is within the South Eastern Highlands IBRA Bioregion (DEH 2000). The maximum distance between all populations is just 6 km (DSE FIS). A century-old record from Mt Hotham has not been recently confirmed (Bean 1997).

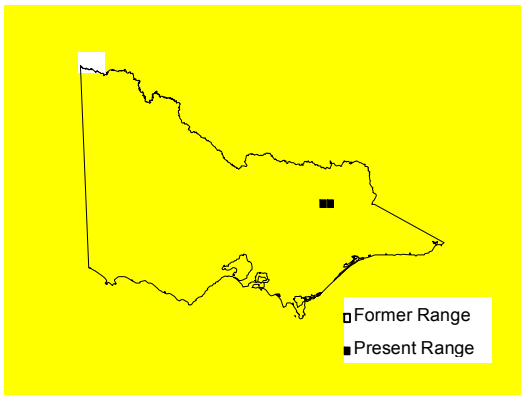

Figure 1. Distribution of *Babingtonia crenulata* in Victoria

Maps showing the detailed distribution of *B. crenulata* 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.

Population Information

The five known populations of *Babingtonia crenulata* occur in the following locations:

Mt Buffalo National Park

- Rollason's Falls area (100–500 plants).
- Eurobin Creek (50–250 plants).
- Mackeys Lookout Area (20–50 plants).
- Mt Buffalo Tourist Road creek lines (50–200 plants).
- Jurisich's Rd.

Private Land

- Eurobin Creek (as above) – the southerly part of this population is located on private land.

In 1998, total abundance was estimate at approximately 1300 plants (DSE unpubl.), and, in 2002, between 220–1000 plants (N. Walsh unpubl.). The discrepancy in numbers is most likely due to the different survey methodology and not any indication of decline in numbers of plants.

Habitat

Populations of *Babingtonia crenulata* occur in open forest and riparian scrub or on rocky outcrops. Some associated species include *Acacia melanoxylon, Acacia pravissima, Cassinia aculeata, Coprosma quadrifida, Eucalyptus camphora, Eucalyptus radiata, Eucalyptus dalrympleana, Kunzea ericoides, Leptospermum grandifolium,* and *Pomaderris aspera*. Soils tend to be shallow, gravelly loams above granite parent material. Altitudinal range varies from around 300–1150 m above sea level. Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

There is little evidence to suggest that *Babingtonia crenulata* has decreased in geographic distribution or abundance since European settlement. There is one old record from Mt Hotham dating back to the early 1900s, but there are no recent records of the species from this location. The major threats to the species on Mt Buffalo are summarised as follows:

Weed invasion: Competition from weeds is the major threat to *Babingtonia crenulata*. Serious weeds include *Lonicera japonica*, *Rubus discolor*, *Leycesteria formosa*, *Salix cinerea* and *Rubus fruticosus* species aggregate; the latter two are considered Weeds of National Significance.

Altered fire regimes: Virtually all populations were burnt in the extensive alpine wildfires of 2003, but it is not known how the populations have been affected. Appropriate fire regimes for this species are unknown. It is not known whether *Babingtonia crenulata* regenerates after fire or some other disturbance such as flood or frost heave**.**

Road works: This a potential threat to populations along the Mt Buffalo Tourist Rd, especially the population at Eurobin Creek near the park entrance.

Recovery Information

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 *Babingtonia crenulata* 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 *Babingtonia crenulata*, the threatened flora team should seek relevant information on it's 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.

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Babingtonia crenulata* 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 *Babingtonia crenulata* 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.
- Establish populations in cultivation.
- Undertake community education and information.

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 its 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 and desk top 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, PV**	• 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 relevant to community ecology and condition. **Responsibility: DSE, PV**	• Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. • Regeneration and recruitment monitored at sites burnt in January 2003. • Habitat Critical to the survival of the species mapped; mapping/survey of populations should incorporate or consider monitoring carried out by A Marion and other PV staff since 1998, notably at the Eurobin Creek site.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. **Responsibility: DSE, PV**	• 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 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 for the Eurobin Creek site if deemed appropriate. • Private land site protected voluntarily.

Action	Description	Performance Criteria
Specific objective 4 **Manage threats to populations**		
4.1	Identify disturbance regimes to maintain habitat. **Responsibility: DSE, PV**	• Preparation of management prescriptions for ecological burning at Rollason's Falls area, Eurobin Creek, Mackeys Lookout Area, and Mt Buffalo Tourist Road creek line sites, considering results of post-January 2003-fire monitoring (Action 2.1).
4.2	Control threats of accidental damage from track building, road widening and slashing of riparian vegetation and pest plants, through the erection of signage, track closure and through the broadscale application of herbicide, and hand removal of weeds. **Responsibility: PV, DSE**	• Measurable seedling recruitment/vegetative regeneration and measurable reduction in plant mortality at Rollason's Falls area, Eurobin Creek, Mackeys Lookout Area, and Mt Buffalo Tourist Road Creeklines sites. • Significant vegetation signage erected at roadside populations at the Mackeys Lookout and Mt Buffalo Tourist Rd creeklines populations. Signage may be best placed where it considers significant species that occur nearby, such as *Acacia phlebophylla*, which occurs along the road at Eurobin Falls and near Mackeys Lookout. • Assist the private landholder in the protection of Eurobin Creek site, through the provision of incentives to fence or control weeds if available. • Eradication of principal threat weeds (eg. *Salix cinerea, Rubus* spp.) from Rollason's riparian zone.
Specific objective 5 **Identify key biological functions**		
5.1	Evaluate current reproductive/regenerative status, seed bank status, by determining longevity, fecundity and recruitment levels. **Responsibility: DSE**	• Seed bank/regenerative potential quantified for each population.
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 information including recruitment and mortality, timing of life history stages and morphological data. **Responsibility: DSE**	• Techniques for monitoring developed and implemented. • Census data collected for target populations. • Determine potential threat of plant disease assessed/determined.
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 important populations.
Specific objective 7 **Establish populations in cultivation**		
7.1	Establish cultivated plants *ex situ* for inclusion in living collections to safeguard against any unforeseen destruction of wild populations. **Responsibility: DSE, RBG**	• Development of effective propagation and cultivation techniques. • At least 30 mature plants in cultivation.
7.2	Establish a seed bank and determine seed viability. **Responsibility: DSE**	• Seed from selected priority/targeted populations in storage.
Specific objective 8 **Undertake community education and information**		
8.1	Identify opportunities for community involvement in the conservation of *Babingtonia crenulata*. **Responsibility: DSE, PV**	• Presentation to community nature conservation groups.

Abbreviations

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

Management Practices

Management practices that will aid recovery

On-ground site management will aim to mitigate threatening processes to prevent declines and create conditions for maintenance or increase of population size. Major threats requiring management include competition from pest plants, inappropriate fire regimes and accidental destruction. A range of strategies will be necessary to alleviate these threats including weed control, fire management, fencing, and control of pest animals. In addition, some *ex situ* conservation measures including seed storage and germination trails, will be required. Addressing major knowledge gaps is also required, especially determining the mechanisms underlying recruitment and regeneration. Successful *in situ* population management will be founded on understanding the relationships between *B. crenulata* 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. Surveys of known and potential habitat should continue to better define the distributions and size of populations. Providing information to land owners, managers and the broader community in the region will increase awareness of the species, provide for increased protection of existing populations, an increased likelihood on new populations being found, and reducing the risk of inadvertent damage occurring.

Management practices that will avoid significant adverse impacts

Providing land owners and managers with information on the location, distribution, habitat and ecology of *B. crenulata* will help to protect existing populations from inadvertent damage, and raising general awareness that may result in the location of any new populations. Populations occurring in potentially high-risk locations such as roadsides may need appropriate signposting. Negotiation with landowners with populations or suitable habitat on their properties will be required for protection of populations. Surveys in potential habitat likely to be impacted by any development proposals (including walking trails and roadworks) will be required to avoid damage to or destruction of any currently unknown populations.

Biodiversity benefits

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 *Babingtonia crenulata*, particularly those species with similar life forms and/or flowering responses. Two rare and potentially threatened wattles, the Catkin Wattle *Acacia dallachiana* and Buffalo Sallow Wattle *Acacia phlebophylla* co-occur with *Babingtonia crenulata* and their conservation will benefit from implementation of recovery actions.

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.

Affected interests

Virtually the entire current range of *B. crenulata* occurs within the Mt Buffalo National Park, which is managed by Parks Victoria, who have approved the actions outlined in this Recovery Plan, subject to the availability of adequate funding. One population also occurs just outside the national park boundary on private land, which is under the jurisdiction of the Alpine Shire Council, who have also approved the actions outlined in this Recovery Plan, subject to the availability of adequate funding.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *B. crenulata* 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.

Social and economic impacts

The implementation of this Recovery Plan will not cause significant adverse social and economic impacts. Most populations occur on public land managed as a national park. Protection of the few plants on private land will be achieved through a voluntary agreement with the landowner.

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**									
1.1	Collect baseline data	1	100%	DSE, PV	**$6,000**	**$0**	**$0**	**$0**	**$0**	**$6,000**
2	**Habitat requirements**									
2.1	Survey known habitat	1	100%	DSE, PV	**$10,000**	**$0**	**$0**	**$0**	**$0**	**$10,000**
2.2	Identify, survey potential habitat	1	75%	DSE, PV	**$10,000**	**$0**	**$0**	**$0**	**$0**	**$10,000**
3	**Protection of habitat**									
3.1	Protect private land sites	2	75%	DSE	**$0**	**$10,000**	**$0**	**$0**	**$0**	**$10,000**
4	**Manage threats**									
4.1	Identify disturbance regimes	2	75%	DSE, PV	**$0**	**$15,000**	**$0**	**$0**	**$0**	**$15,000**
4.2	Control threats	1	75%	PV	**$10,000**	**$10,000**	**$10,000**	**$5,000**	**$5,000**	**$40,000**
5	**Identify key biol.l functions**									
5.1	Evaluate reproductive status	3	75%	DSE	**$0**	**$0**	**$10,000**	**$10,000**	**$0**	**$20,000**
5.2	Seed germination	3	75%	DSE	**$0**	**$0**	**$10,000**	**$10,000**	**$0**	**$20,000**
6	**Growth rates, pop. viability**									
6.1	Conduct censusing	3	100%	DSE	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$30,000**
6.2	Collate, analyse and report	3	100%	DSE	**$4,000**	**$4,000**	**$4,000**	**$4,000**	**$10,000**	**$26,000**
7	**Establish pops in cultivation**									
7.1	Establish cultivated plants	3	50%	DSE, RBG	**$0**	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$24,000**
7.2	Establish a seed bank	3	50%	DSE	**$0**	**$4,000**	**$4,000**	**$4,000**	**$4,000**	**$16,000**
8	**Education, communication**									
8.1	Community extension	3	100%	DSE, PV	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$30,000**
				Totals	**$52,000**	**$61,000**	**$56,000**	**$51,000**	**$37,000**	**$257,000**