Department of
Sustainability and
Environment

National Recovery Plan for the Aniseed Boronia *Boronia galbraithiae*

Oberon Carter and Neville Walsh

Australian Government

Victoria
The Place To Be

Prepared by Oberon Carter (Department of Sustainability and Environment, Victoria) and Neville Walsh (Royal Botanic Gardens, Melbourne).

Published by the Victorian Government Department of Sustainability and Environment (DSE) Melbourne, November 2006.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

ISBN 1 74152 310 9

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.

An electronic version of this document is available on the DSE website www.dse.vic.gov.au

For more information contact the DSE Customer Service Centre 136 186

Citation: Carter, O. and Walsh, N. 2006. National Recovery Plan for the Aniseed Boronia *Boronia galbraithiae*. Department of Sustainability and Environment, Melbourne.

Cover photograph: Aniseed Boronia *Boronia galbraithiae* by John Eichler.

Table of Contents

Figures

Summary

The Aniseed Boronia *Boronia galbraithiae* 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. *Boronia galbraithiae* is endemic to Victoria, where it is apparently confined to elevated, tall open-forest sites between Stockdale and Dargo in central Gippsland (Walsh & Entwisle 1999). About 3,000 plants occur in three populations over a total range of only about 5 km. Potential threats include logging activities, roadworks and altered fire regimes. This national Recovery Plan for *B. galbraithiae* 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 Aniseed Boronia *Boronia galbraithiae* is a fennel-scented glabrous shrub growing up to 2 m tall (usually much shorter), with 4-angled branches. Leaves are hairless, opposite and divided into 5–11 elliptic leaflets to 8 x 3 mm. Leaf margins are finely toothed. The flowers are white to deep pink, up to 15 mm wide and appear in the leaf axils in spring. Sepals are ovate, deltoid, 1–2 mm long, glabrous and overlap each other, while the petals are 4.5–8 mm long, also overlap each other and the midrib is not raised. The seeds are shiny black seeds and 2–2.5 mm long (description based on Albrecht & Walsh 1993; FIS; Walsh & Entwisle 1999). Following fire (at least that of low to moderate intensity), regeneration occurs from rootstock as well as from seed (Albrecht & Walsh 1993).

Boronia galbraithiae differs from the closely related *Boronia muelleri* in it is consistently shorter, narrower leaflets (<10 mm compared to >10 mm in *B. muelleri*) with finely toothed margins (normally entire in *B. muelleri*) (Albrecht & Walsh 1993). *Boronia muelleri* is also generally much taller than *B. galbraithiae*, growing up to 7 m tall, and tends to prefer moister and more sheltered habitat than *B. galbraithiae* (Albrecht & Walsh 1993). Further, the odour of vegetative parts is distinctly different between the two species (a consequence of the chemical composition of the leaf oils).

Distribution

Boronia galbraithiae is endemic to Victoria, and is apparently confined to a very small area between Stockdale and Dargo, in central Gippsland (Walsh & Entwisle 1999), in the South East Coastal Plain IBRA Bioregion (DEH 2000). Total range is only about 5 km, and the populations occur from 210–540 m above sea level (Albrecht & Walsh 1993; N. Walsh pers. obs.).

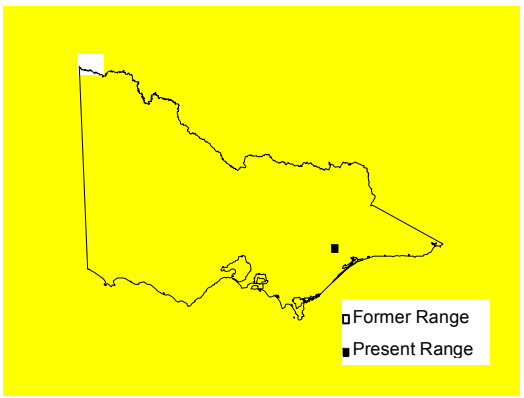

Figure 1. Distribution of *Boronia galbraithiae* in Victoria

Maps showing the distribution of *B. galbraithiae* are available from the Department of Sustainability and Environment Flora Information System (DSE-FIS), which is a state-wide

repository for flora grid and site distribution data, photographs and text descriptions, and is updated regularly. These data are available on request in a variety of formats for natural resource management purposes.

Population Information

The three known populations of *Boronia galbraithiae* occur in State Forest at the following locations:

- Insolvent Track (southern population): (300-500 plants)
- Insolvent Track (northern population): (~2000 plants)
- Howards Road: (~400 plants)

Habitat

Populations of *Boronia galbraithiae* occur in tall open sclerophyll forest, usually dominated by *Eucalyptus sieberi*, with the co-dominants *Eucalyptus muelleriana*, *Eucalyptus cypellocarpa*, *Eucalyptus polyanthemos* and/or *Eucalyptus dives*. Associated sub-strata species typically include, but are not restricted to, *Acacia obliquinervia*, *Dampiera stricta*, *Daviesia latifolia*, *Hibbertia riparia*, *Joycea pallida* and *Pultenaea scabra.* Many other shrubs, and herbaceous plants are also usually present. The largest population of *Boronia galbraithiae* occurs on a dry ridge-top on skeletal soils, while the other two known populations occur in sub-riparian and moist forest habitats. Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

Boronia galbraithiae is known only from one very small area in central Gippsland. 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, with populations most at risk from inadvertent damage. Given the very limited distribution and low numbers of plants, the risk from stochastic events is probably moderate to high.

Inappropriate fire regimes: Fire frequency and intensity may be important to survival of *B. galbraithiae*. Regeneration from root stock and seed has been observed following fire. However, too frequent fires may be killing plants before they reach seed production age, and too infrequent fires may not permit sufficient recruitment to replace senescing plants. Fires of too high intensity may be killing plants and destroying seed, reducing prospects for regeneration.

Roadworks: Some plants occur close to road and track alignments, and may be at risk from any works such as road widening.

Forestry operations: There is no evidence of recent logging in the area where the populations occur. However, with populations occurring on public land designated for production of forest products, and so few plants occurring in such a small area, populations may be at risk without proper safeguards.

Recovery Information

Directions for recovery of *B. galbraithiae* include habitat conservation, restoration and management, combined with an understanding of the species' ecological and biological requirements. 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.

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Boronia galbraithiae* 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 *Boronia galbraithiae* 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 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**	• 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**	• 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 protected and managed appropriately**		
3.1	Protect populations on public land. **Responsibility: DSE**	• Negotiate Special Protection Zones in State Forest at Insolvent Track (northern and southern populations) and Howards Rd sites if required.
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 Insolvent Track and Howards Rd sites.
4.2	Control threats from accidental damage, using appropriate signage. **Responsibility: DSE**	• Measurable seedling recruitment/vegetative regeneration and reduction in mortality at Insolvent Track and Howards Rd sites. • Sign installation at Insolvent Track and Howards Rd sites.

Action	Description	Performance Criteria
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.
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 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 **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 (10 different genotypes per population) mature plants in cultivation.
7.2	Establish a seed bank and determine seed viability. **Responsibility: DSE**	• Long-term storage facility identified. • Seed from target populations in storage.
Specific objective 8 **Undertake community education and information**		
8.1	Identify opportunities for community involvement in the conservation of *Boronia galbraithiae*. **Responsibility: DSE**	• Presentation to community nature conservation groups. • Inform road works contractors and local timber industry authorities of *Boronia galbraithiae.*

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. Threats requiring management include accidental destruction and inappropriate fire regimes. Strategies necessary to alleviate these threats include zoning, fire management and fencing or signposting. 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. galbraithiae* 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 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 managers with information on the location, distribution, habitat and ecology of *B. galbraithiae* will help to protect existing populations from inadvertent damage, and raising general awareness may result in the location of any new populations. Sites where populations occur may need additional protection through such as through the designation of Special Protection Zones or other reserve zoning. Populations occurring in potentially high-risk locations such as roadsides may need appropriate signposting. Surveys in potential habitat likely to be impacted by any logging or roading proposals will be required to avoid damage to or destruction of any currently unknown populations.

Affected interests

All populations of *B. galbraithiae* occur in State Forest under the jurisdiction of DSE. All divisions with an involvement in biodiversity conservation and forest management, and the Gippsland Region 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 *B. galbraithiae* 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 *Boronia galbraithiae*, 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 will not cause any significant adverse social and economic impacts. The species occurs entirely on public land designated as State Forest, which is under the jurisdiction of DSE, and the protection measures outlined in this Recovery Plan will have negligible (if any) impact on forest management activities in the area.

Acknowledgments

The authors would like to thank Leona Waldegrave-Knight, Fiona Coates and Gary Backhouse (DSE) and John Eichler for their contributions to this Recovery Plan.

Bibliography

Albrecht, D.E. and Walsh, N.G. 1993. Two new species of *Boronia* (Rutaceae) endemic in Victoria. *Muelleria* 8(1): 21–25.

DEH 2000. *Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report*. Environment Australia, Canberra.

Walsh, N.G. and Entwisle, T.J. 1999. *Flora of Victoria Volume 4: Dicotyledons: Cornaceae to Asteraceae*. Inkata Press, Melbourne.

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	**$6,000**	**$0**	**$0**	**$0**	**$0**	**$6,000**
2	**Habitat requirements**									
2.1	Survey known habitat	1	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	**Protection of habitat**									
3.1	Protect public land habitat	1	75%	DSE	**$0**	**$10,000**	**$0**	**$0**	**$0**	**$10,000**
4	**Manage threats**									
4.1	Identify disturbance regimes	2	75%	DSE	**$0**	**$15,000**	**$0**	**$0**	**$0**	**$15,000**
4.2	Control threats	1	90%	DSE	**$10,000**	**$10,000**	**$10,000**	**$5,000**	**$5,000**	**$40,000**
5	**Identify key biol.l functions**									
5.1	Evaluate reproductive status	2	75%	DSE	**$0**	**$15,000**	**$0**	**$0**	**$0**	**$15,000**
5.2	Seed germination	2	75%	DSE	**$10,000**	**$10,000**	**$10,000**	**$5,000**	**$5,000**	**$40,000**
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	2	50%	DSE/RBG	**$0**	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$24,000**
7.2	Establish a seed bank	1	50%	DSE	**$0**	**$4,000**	**$4,000**	**$4,000**	**$4,000**	**$16,000**
8	**Education & communication**									
8.1	Community extension	2	100%	DSE	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$6,000**	**$30,000**
				Totals	**$52,000**	**$61,000**	**$56,000**	**$51,000**	**$37,000**	**$265,000**