Department of
Sustainability and
Environment

National Recovery Plan for the Marble Daisy-bush *Olearia astroloba*

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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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Cover photograph: Marble Daisy-bush *Olearia astroloba*, by John Eichler.

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Summary

The Marble Daisy-bush *Olearia astroloba* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 and Threatened under the Victorian *Flora and Fauna Guarantee Act* 1988. The species is endemic to eastern Victoria, where it is known from a single population containing about 1,000 plants. This national Recovery Plan for *O. astroloba* 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 Marble Daisy-bush *Olearia astroloba* is a small shrub growing to 0.5 m tall, with a dense covering of fine, star-shaped hairs. Leaves are grey-green, alternate and spoon shaped, to 18 mm x 10 mm, with a hairy lower surface, the leaf margins often lobed in the distal half. The typical 'daisy' flowers are about 25 mm across, with a yellow central 'button' and narrow, pale purple 'petals'. Flowers appear continuously from about June through to March, with a peak in June and July (description from Earl & Bramwell 1999; Lander & Walsh 1989; Walsh & Entwisle 1999).

There have been no ecological or biological studies of *Olearia astroloba*. The single known site contains mostly mature, apparently healthy plants (Earl & Bramwell 1999). There is profuse flowering in most year, but the quantity of viable seed produced is unknown. Response to fire is also not known, although it is apparent that long-fire intervals can be tolerated, as the site may not have been burnt for over 100 years (Earl & Bramwell 1999).

Distribution

Olearia astroloba is endemic to Victoria, where it is known only from a single site near the headwaters of the Tambo River in East Gippsland (Walsh & Entwisle 1999), in the South East Corner IBRA Bioregion (DEH 2000).

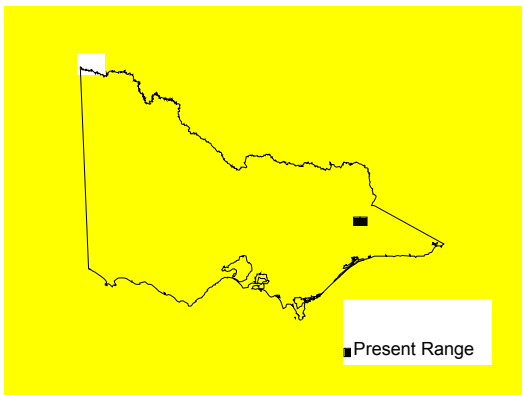

Figure 1. Distribution of *Olearia astroloba* in Victoria

Maps showing the detailed distribution of *O. astroloba* 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 single population of *O. astroloba* occurs in Marble Gully near Mt Tambo, in State Forest (proposed Mt Tambo Nature Conservation Reserve). There are an estimated 1,030 plants scattered over an area of about 40 ha.

Habitat

Olearia astroloba occurs at about 600 m above sea level on a steep (40^{o}–60^{o} slope) northerly aspect (Earl & Bramwell 1999), growing in *Pomaderris oraria* subsp. *calcicola* shrubland, with occassional emergent *Allocasuarina verticillata* and *Eucalyptus nortonii*, and *Themeda triandra* and *Ozothamnus adnatus* understorey (Lander & Walsh 1989). Soils are skeletal, and derived from Silurian limestone/marble, and the close association of this species with marble is reflected in the common name 'Marble Daisy-bush' (Earl & Bramwell 1999). Mean annual rainfall is about 650 mm/year. Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

The Marble Daisy-bush is known only from one very small area in eastern 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: Much of the Marble Gully site was burnt in January 2003. Some mature plants survived, especially on the eastern end of the spur. Resprouting and seedling regeneration has since be observed over much of the previously occupied site, indicating that *O. astroloba* can tolerate fire. However, too frequent fire may pose a threat if soil seed store has not been replenished.

Weed invasion: Weed invasion by Blackberry *Rubus fruticosus* species aggregate (a Listed Weed of National Significance), various thistles and Horehound *Marrubium vulgare* occurs at the site. Patchy infestations occur along Old Hutt Creek and on the lower slopes. Establishment of weed seedlings higher on the slopes amongst *O. astroloba* requires regular monitoring and control if necessary.

Grazing: Grazing by domestic stock and rabbits may particularly threaten the survival of *O. astroloba* seedlings (Earl & Bramwell 1999). Competition and land degradation by rabbits is listed under the EPBC Act as a Key Threatening Process.

Marble mining: A previous proposal to mine marble at the site was refused, although future proposals are possible. Impacts of mining include direct destruction of and damage to plants and habitat, increased weed invasion via soil disturbance and vehicular traffic and increased susceptibility to collection due to improved access to habitat (Earl & Bramwell 1999).

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Olearia astroloba* 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, the **specific objectives** of recovery for *Olearia astroloba* 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.
- 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. • Population 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. • Core habitat mapped.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. **Responsibility: DSE**	• Comprehensive surveys have been conducted in limestone outcrops at Buchan, Lake Tyers, Tambo River and Mitchell River but without success (Earl & Bramwell 1999).
Specific objective 3		
Ensure that all populations and their habitat are legally protected		
3.1	Confirm reservation of Marble Gully and liaise with Parks Victoria to establish management responsibility. **Responsibility: DSE**	• Parks Victoria have assumed management responsibility for the Marble Gully site.
Specific objective 4		
Manage threats to populations		
4.1	Identify disturbance regimes to maintain habitat. **Responsibility: DSE**	• Preparation of management prescriptions for ecological burning; modify prescriptions as information on fire ecology of *O. astroloba* (and Silurian Limestone community) is obtained.
4.2	Control threats from pest plants, animals and potential collectors by preventing access, using spot-spraying of herbicide and fencing as appropriate. **Responsibility: DSE**	• Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at the Marble Gully site. • Develop & implement an integrated weed management strategy. • Do not install promotional signage until community is secure.

Action	Description	Performance Criteria
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.
5.2	Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli. **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.
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 the existing population.
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 25 mature plants in cultivation.
7.2	Establish a seed bank and determine seed viability. **Responsibility: DSE**	• Long-term storage facility identified. • Seed from sole population in storage.
Specific objective 8 **Build community support for conservation**		
8.1	Identify opportunities for community involvement in the conservation of *Olearia astroloba*. **Responsibility: DSE**	• Presentation to community nature conservation groups.

Abbreviations: DSE: Department of Sustainability and Environment, 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 *Olearia astroloba*. 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 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 *Olearia astroloba* 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. Translocation of cultivated plants will be considered as there is a high chance of success and secure site(s) exist.

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 *Olearia astroloba*, 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.

Affected interests

The single known population of *Olearia astroloba* occurs on Crown land managed by the Victorian Department of Sustainability and Environment. Upon reservation of the area as the Mt Tambo Nature Conservation Reserve, Parks Victoria will be the land manager.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Olearia astroloba* 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 *Olearia astroloba*, particularly those species with similar life forms and/or flowering responses.

The vegetation community associated with *Olearia astroloba*, Silurian Limestone *Pomaderris* Shrubland, is listed as threatened under the Victorian *Flora and Fauna Guarantee Act* 1988 and is likely to benefit from conservation actions provided for *Olearia astroloba,* including weed and fire management and negotiations for increased legal protection.

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. The species occurs at a single site on Crown land that is currently managed for its nature conservation value and is generally not accessible to the public, and the Victorian Government has refused a previous application to mine marble at the site.

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	$0	$0	$0	$0	$0	**$0**
2	**Habitat requirements**									
2.1	Survey known habitat	1	100%	DSE	$6,000	$0	$0	$0	$0	**$6,000**
2.2	Identify, survey potential habitat	1	75%	DSE	$0	$0	$0	$0	$0	**$0**
3	**Legal protection of habitat**									
3.1	Protect public land habitat	1	75%	DSE	$2,000	$2,000	$0	$0	$0	**$4,000**
4	**Manage threats**									
4.1	Identify disturbance regimes	3	75%	DSE	$4,000	$0	$0	$0	$0	**$4,000**
4.2	Control threats	1	75%	DSE	$10,000	$20,000	$10,000	$5,000	$5,000	**$50,000**
5	**Identify key biol. functions**									
5.1	Evaluate reproductive status	3	75%	DSE	$4,000	$0	$0	$0	$0	**$4,000**
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	2	100%	DSE	$15,000	$15,000	$15,000	$15,000	$15,000	**$75,000**
6.2	Collate, analyse and report	2	100%	DSE	$1,000	$1,000	$1,000	$1,000	$5,000	**$9,000**
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	$6,000	$6,000	$6,000	$6,000	$6,000	**$30,000**
				TOTAL	**$48,000**	**$64,000**	**$52,000**	**$37,000**	**$41,000**	**$242,000**