Department of
Sustainability and
Environment

National Recovery Plan for the Langi Ghiran Grevillea *Grevillea montis-cole* subspecies *brevistyla*

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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: Langi Ghiran Grevillea *Grevillea montis-cole* subspecies *brevistyla* by Andrew Pritchard.

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Summary

The Langi Ghiran Grevillea *Grevillea montis-cole* subspecies *brevistyla* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999, and is protected (but not specifically listed) under the Victorian *Flora and Fauna Guarantee Act* 1988 (all Victorian Grevilleas are protected). The taxon is endemic to central western Victoria, where it is restricted to near the summit of Mt Langi Ghiran, with the population consisting of about 900 plants. Major threats include damage by walkers, cinnamon fungus, vehicle movement and altered fire regimes. This national Recovery Plan for the Langi Ghiran Grevillea 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 Langi Ghiran Grevillea *Grevillea montis-cole* subspecies *brevistyla* is a prostrate to spreading shrub growing to 1 m in height. New growth is densely hairy with ferruginous to reddish-purple hairs. Leaves are ovate, 3–7 cm long and 1.5–5.5 cm wide, with 5–15 spreading primary lobes that are further divided into sub-triangular ultimate lobes. Mature leaves have a bright green, almost glabrous upper surface and a dull pale green lower surface that is glabrous or has a scattered to patchy covering of ascending to spreading hairs on the veins. Conflorescences are terminal, decurved, simple and secund and 2–6 cm long. Individual flowers have a narrow green to brown perianth with a glabrous inner surface and tomentose outer surface, and a pistil of 15–17 mm long, with a villous stipitate ovary, a glabrous bright red style and slightly to very oblique, greenish-yellow pollen presenter. Flowers appear in October and November, and have tomentose fruits with reddish dorsal markings (description from Smith 1983; Walsh & Entwisle 1996). A shorter pistil length combined with shorter and broader leaves distinguishes this subspecies from *Grevillea montis-cole* subsp. *montis-cole*. Leaves showing some secondary division and relatively large floral bracts distinguish *Grevillea montis-cole* from other Victorian 'holly-leaved' *Grevillea* species (Walsh & Entwisle 1996).

There have been no targeted biological or ecological studies of *Grevillea montis-cole* subsp. *brevistyla*. This species occurs where fires are uncommon, but the conditions required for recruitment events are unknown. Seedlings were observed in 2002 (J. Downe, pers. obs.) .and 2004 (A. Pritchard, pers obs.), suggesting this species may persist without fire. However, the long-term effects of the lack of fire on vegetation community structure, and therefore the habitat for this species are unknown.

Distribution

Grevillea montis-cole subsp. *brevistyla* is endemic to Victoria, where it is confined to a small area near the summit of Mt Langi Ghiran, approximately 200 km north-west of Melbourne (Walsh & Enwisle 1996), in the Victorian Midlands IBRA Bioregion (DEH 2000).

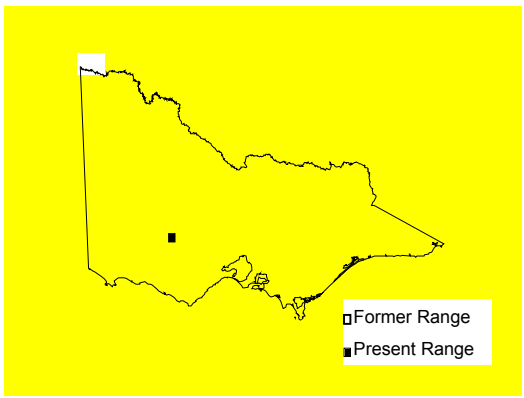

Figure 1. Distribution of *Grevillea montis-cole* subsp. *brevistyla* in Victoria

Maps showing the detailed distribution of *G. montis-cole* subsp. *brevistyla* 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

The population of Langi Ghiran Grevillea comprises about 500 adult plants and 400 seedlings (S. Kelly & A. Pritchard DSE pers. obs. 2004), growing in several discrete groups (sub-populations) on Mt Langi Ghiran, within the Langi Ghiran State Park (managed by Parks Victoria).

Habitat

The Langi Ghiran Grevillea occurs in open eucalypt woodland among granite outcrops, at 800–900 m altitude (Walsh & Entwisle 1996). Associated species include *Leptospermum turbinatum*, *Eucalyptus goniocalyx*, *Astroloma humifusum*, *Correa aemula*, *Dodonaea viscosa* subspecies *cuneata*, *Kunzea parvifolia* and *Astrotricha* species (N. Walsh unpubl.).

Threats

There is little information on the former distribution and abundance of *G. montis-cole* subsp. *brevistyla*, so it is not certain if there has been any decline. The main threats to the species are summarised as follows:

Accidental Introduction of Cinnamon Fungus *Phytophthora cinnamomi*: Accidental introduction of Cinnamon Fungus by walkers accessing the site is probably its most immediate and real threat, given the highly sensitive nature of many species of Grevillea to this pathogen.

Accidental damage: One group of plants occurs near a hang-glider launch site, and individual plants may be inadvertently trampled or crushed by people and vehicles accessing the site.

Inappropriate fire regimes: The effect of fire on this species is unknown. Prescribed fires are difficult to maintain at Mt Langi Ghiran and are unlikely to be implemented. Lightning strikes do not appear to have been sufficient to carry fires in the past. Fire ignited outside the park that spreads to Mt Langi Ghiran poses a potential threat to plants.

Browsing: Wallabies browse in the area of *Grevillea montis-cole* subsp. *brevistyla* plants and may damage individuals.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Grevillea montis-cole* subsp. *brevistyla* 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 *Grevillea montis-cole* subsp. *brevistyla* are to:

- Acquire accurate information for conservation status assessments.
- Identify habitat that is critical, common or potential.
- 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 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**	• 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. • Habitat critical to the survival of the species is mapped.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information that may indicate habitat preference. **Responsibility: DSE**	• Predictive model for potential habitat developed and tested.
Specific objective 3		
Manage threats to populations		
3.1	Control threats from pest animals, high visitor numbers causing accidental damage by preventing access, re-routing tracks, caging plants and/or erecting signage. **Responsibility: PV**	• Measurable seedling recruitment/vegetative regeneration and a reduction in plant mortality.
Specific objective 4		
Identify key biological functions		
4.1	Evaluate current reproductive/regenerative status by determining seed bank status and longevity, fecundity and recruitment levels. **Responsibility: DSE**	• Seed bank/regenerative potential quantified.
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**	• 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 5		
Determine the growth rates and viability of populations		
5.1	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.
5.2	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 6		
Establish populations in cultivation		
6.1	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 50 mature plants in cultivation.
6.2	Establish a seed bank and determine seed viability. **Responsibility: DSE**	• Seed from important populations in storage.
Specific objective 7		
Build community support for conservation		
7.1	Identify opportunities for community involvement in the conservation of *Grevillea montis-cole* subsp. *brevistyla*. **Responsibility: DSE**	• Presentation to community nature conservation groups.

Abbreviations

DSE Department of Sustainability and Environment, Victoria

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 *Grevillea montis-cole* subsp. *brevistyla*. 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 potential threats requiring management include accidental destruction, and inappropriate fire regimes. A range of strategies will be necessary to alleviate these threats including, fire management, and preventing access to recreational users or erecting appropriate conservation signage.

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 *Grevillea montis-cole* subsp. *brevistyla* 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 *Grevillea montis-cole* subsp. *brevistyla*, 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 *Grevillea montis-cole* subsp. *brevistyla* occurs on land managed by Parks Victoria, who have approved the actions outlined in this Recovery Plan.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Grevillea montis-cole* subsp. *brevistyla* 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

Grevillea montis-cole subsp. *brevistyla*, 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 single location where the species occurs is on public land, in a State Park, and protection measures will not unduly impact on current commercial or recreational activities.

Acknowledgments

The author would like to thank Clint Chandler (Parks Victoria), Fiona Coates, Andy Arnold, Sarah Kelly, Andrew Pritchard and Gary Backhouse (DSE) and Neil R. Marriott (Trust for Nature) for their contributions to this Recovery Plan.

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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	$8,000	$0	$0	$0	$0	**$8,000**
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	**Manage threats**									
3.1	Identify disturbance regimes	1	75%	DSE	$0	$10,000	$10,000	$0	$0	**$20,000**
3.2	Control threats	2	75%	PV	$5,000	$5,000	$5,000	$5,000	$5,000	**$25,000**
4	**Identify key biol. functions**									
4.1	Evaluate reproductive status	3	75%	DSE	$5000	$5000	$0	$0	$0	**$10,000**
4.2	Seed germination	3	75%	DSE	$0	$5000	$5000	$0	$0	**$10,000**
5	**Growth rates, pop. viability**									
5.1	Conduct censusing	3	100%	DSE	$10,000	$8,000	$8,000	$8,000	$8,000	**$42,000**
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, RBG	$0	$5,000	$10,000	$10,000	$10,000	**$35,000**
6.2	Establish a seed bank	2	50%	DSE	$0	$4,000	$4,000	$0	$0	**$8,000**
7	**Education, communication**									
7.1	Community extension	3	100%	DSE	$6,000	$6,000	$6,000	$6,000	$6,000	**$30,000**
	TOTAL				**$55,000**	**$39,000**	**$39,000**	**$30,000**	**$34,000**	**$197,000**