Department of Sustainability and Environment

National Recovery Plan for the Kelleria *Kelleria laxa*

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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: Kelleria *Kelleria laxa*, by John Eichler

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Summary

The Kelleria *Kelleria laxa* 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 Victoria, where it is known from a single location in the eastern highlands, the single population containing between 1000–2000 plants. Main threats include grazing, accidental damage through trampling and climate change. This national Recovery Plan for *Kelleria laxa* 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 Kelleria *Kelleria laxa* is a prostrate spreading shrub growing to only about 30 mm tall but at least 40 cm (and possibly to 200 cm) in diameter. Stems are about 1 mm in diameter, with short hairs at the leaf-bases, and numerous roots produced freely along the stems. Leaves are grey-green, narrowly elliptic or lanceolate, alternate, 0.5–3.5 mm long and 0.6–0.7 mm wide, with one main vein and two lesser veins on the underside. The cream to white flowers appear in January. They are tubular, 3–3.5 mm long (including the 4 apical lobes each 1 mm long), and produced in heads of 1–4 flowers at the branch-tips. Each flower head has 1–2 central vegetative buds, which grow out into leafy shoots after the flowers mature. The fruit is an ovoid seed to 2 mm long, enclosed within a thin, membranous sheath (the dried ovary wall) (description from Walsh & Entwisle 1996). There have been no targeted studies of the ecology of *Kelleria laxa* but some aspects of the species' ecology were addressed in an Honours study (Marks 2002).

Australian plants of *Kelleria laxa* and the closely related *Kelleria dieffenbachii* (from New South Wales and Tasmania) were previously identified as *Drapetes tasmanica*. Following a revision of the group (Heads 1990), the genus *Drapetes* is now regarded as being confined to South America, while *Kelleria* occurs only in Borneo, New Guinea, New Zealand and Australia. The taxonomy of *Kelleria laxa* (*sensu* Heads 1990) is unclear. Australian plants currently referred to that species are believed to be taxonomically distinct from those in New Zealand populations (Marks 2002). The circumscription of the species here follows Walsh & Entwisle (1996).

Distribution

Kelleria laxa is endemic to Victoria, where it is known from a single location on the Bogong High Plains in the eastern highlands, near Mt Jim, at about 1800 m altitude (Walsh & Entwisle 1996), in the Australian Alps IBRA Bioregion (DEH 2000).

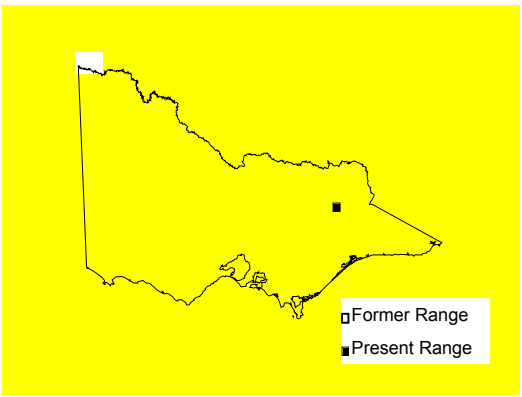

Figure 1. Former and current distribution of *Kelleria laxa* in Victoria

Maps showing the detailed distribution of *K. laxa* 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.

Habitat

Kelleria laxa occurs in *Poa costiniana* grassland and *Lobelia surrepens – Stackhousia pulvinaris* herbland. Topography is more or less flat or sloping slightly downhill. Plants grow on alpine humus soils, typically about 40 cm deep, derived from basalt parent material and organic matter. Plants tend to occur in slight depressions, and it suspected that moist sites are important for plant survival (N. Walsh pers. obs.). Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Population Information

The single population of *Kelleria laxa* comprises 19 discrete 'patches', varying in size from 0.01 m^2 to 700 m^2. Population size is difficult to estimate, due to the spreading and suckering habit of *K. laxa*. Estimates vary from 400 (Walsh & Entwisle 1996) to 2,000 plants (N. Walsh unpubl.). The population occurs within the Alpine National Park, managed by Parks Victoria.

Threats

As there is no information on past distribution or abundance of *Kelleria laxa*, and little 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. All known patches of *K. laxa* appear unaffected by the extensive wildlfires of early 2003 (J. Morgan pers comm.). There may have been some decline due to drying out of some patches. Threats are generally rated as low, with populations most at risk from inadvertent damage. With its low, mat forming habit, it is easily damaged by human trampling or herbivore grazing. Given the extremely limited distribution and very low numbers of plants, the risk from stochastic events is probably high. Climate change represents a substantial future risk. The main risks are summarised as follows:

Grazing: Grazing and trampling by cattle and feral horses threatens all patches. Cattle grazing has now been removed from the Alpine National Park, but the threat from feral horses still remains.

Trampling: Recreational hikers use areas near some populations, and plants may be accidentally damaged through trampling.

Climate change and drought: Increased temperatures and decreased rainfall expected with global warming may lead to long-term drying of sites, threatening this and many other alpine species. There is some anecdotal evidence of a decline in plant numbers between 1993 and 2002 in patches on drier sites (N. Walsh pers obs.). Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases is listed as a Key Threatening Process under the EPBC Act. The effects of climate change potentially threaten all sites.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Kelleria laxa* 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 *Kelleria laxa* 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	Clarify the taxonomy of populations to enable an accurate conservation status assessment. **Responsibility: RBG**	• Updated records on all State databases. • Taxonomic revision of *Kelleria laxa*.
1.2	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. • 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 describing 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		
Manage threats to populations		
3.1	Establish levels of threats from pest animals, grazing and recreational damage by initiating exclusion trials on representative sites and/or preventing access, designating alternative stocking areas, fencing sites, caging plants or installing signage. **Responsibility: PV**	• Measurable seedling recruitment/vegetative regeneration and a reduction in plant mortality at the Mt Jim site. • Implement fencing, stock exclusion, signage at Mt Jim site. • Identify main threatening process.

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**	• 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. • Determine recruitment response to the 2003 wildfire.
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 30 mature plants in cultivation.
6.2	Establish a seed bank and determine seed viability. **Responsibility: DSE**	• Long-term storage facility identified. • Seed from important populations in storage.

Action	Description	Performance Criteria
Specific objective 7 **Build community support for conservation**		
7.1	Identify opportunities for community involvement in the conservation of *Kelleria laxa*. **Responsibility: DSE**	• Presentation(s) 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 *Kelleria laxa*. 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 inappropriate fire regimes and grazing by pest animals. A range of strategies will be necessary to alleviate these threats including, 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 *Kelleria laxa* 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

The one known wild population of *Kelleria laxa* falls under the jurisdiction of Parks Victoria, who 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 *Kelleria laxa* 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 *Kelleria laxa*, 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. All populations occur within national parks which include biodiversity conservation as a high priority in management. Any protection measures for populations (such as fencing or signposting) will have negligible impact on current commercial and recreational activities.

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	Clarify taxonomy	1	100%	RBG	$0	$4,000	$0	$0	$0	**$4,000**
1.2	Collect baseline data	1	100%	DSE	$10,000	$0	$0	$0	$0	**$10,000**
2	**Habitat requirements**									
2.1	Survey known habitat	1	100%	DSE	$20,000	$0	$0	$0	$0	**$20,000**
2.2	Identify, survey potential habitat	1	75%	DSE	$20,000	$0	$0	$0	$0	**$20,000**
3	**Manage threats**									
3.1	Control threats	1	75%	PV	$10,000	$8,000	$8,000	$4,000	$4,000	**$34,000**
4	**Identify key biol.l functions**									
4.1	Evaluate reproductive status	2	75%	DSE	$0	$12,000	$12,000	$0	$0	**$24,000**
4.2	Seed germination	2	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, RBG	$0	$6,000	$6,000	$6,000	$6,000	**$24,000**
6.2	Establish a seed bank	2	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**
				TOTAL	**$82,000**	**$66,000**	**$62,000**	**$36,000**	**$40,000**	**$286,000**