National Recovery Plan for the Dergholm Guinea-flower *Hibbertia humifusa* subspecies *debilis*

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Cover photograph: Dergholm Guinea-flower *Hibbertia humifusa* subspecies *debilis*, by Richard Hill.

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Summary

The Dergholm Guinea-flower *Hibbertia humifusa* subspecies *debilis* 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 (under the name *Hibbertia* sp. aff. *humifusa*). This subspecies is endemic to south-western Victoria, where about 200 plants occur in four wild populations. It is poorly known and threats are not clearly understood. This national Recovery Plan for the Dergholm Guinea-flower 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 Dergholm Guinea-flower *Hibbertia humifusa* subsp. *debilis* is a shrub with branches to 20 cm long that grow horizontally, but turn up at the ends. Branches have simple or stellate hairs below the flowers. Leaves are linear-elliptic or linear-lanceolate, 4–14 mm long and 1–3 mm wide, with a terminal tuft of simple hairs. Leaf margins are revolute and scarcely raised above a narrow central ridge that is covered in tomentose hairs. Yellow flowers are borne at the end of a thread-like peduncle 4–7 mm long, with 1–2 bracts in the lower third of the peduncle. Outer sepals are 3.3–3.6 mm long and 1.3–1.5 mm wide and are sparsely covered with scattered simple over stellate hairs. Flowering occurs in November and December (description from Walsh & Entwisle 1996). This subspecies is distinguished from other subspecies of *Hibbertia humifusa* in having narrower outer sepals than *Hibbertia humifusa* subsp. *humifusa*, and shorter sepals than *Hibbertia humifusa* subsp. *erigens* also has scattered stellate hairs on its branches while *Hibbertia humifusa* subsp. *debilis* does not (Toelken 1995). There have been no targeted ecological or biological studies of the Dergholm Guinea-flower. The cues required for germination are unknown, however anecdotal information suggests fire may be important.

Distribution

The Dergholm Guinea-flower is endemic to Victoria, where it is confined to a small area near Dergholm in south-western Victoria (Walsh & Entwisle 1996), in the Narracoorte Coastal Plain IBRA Bioregion (DEH 2000).



Figure 1. Distribution of Hibbertia humifusa subsp. debilis in Victoria

Maps showing the detailed distribution of The Dergholm Guinea-flower 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

The Dergholm Guinea-flower occurs in wet heathland, and grows with a range of species including *Leptospermum continentale*, *Banksia marginata*, *Hibbertia fasciculata*, *Epacris impressa* and *Styphelia adscendens* (J. Downe pers. obs.). Scattered *Eucalyptus camaldulensis* or *Eucalyptus ovata* comprise a generally sparse overstorey. 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

Only four populations of Dergholm Guinea-flower are known, comprising about 200 plants. All populations occur within the Dergholm State Park, managed by Parks Victoria.

Threats

The Dergholm Guinea-flower is known only from one very small area in south-western 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, with populations most at risk from inadvertent damage. Given the extremely limited distribution and very low numbers of plants, the risk from stochastic events is probably high. One population occurs close to a fire dam and may be at risk from vehicle movement and earthworks associated with dam maintenance. Fire intervals shorter than the time taken to reach reproductive maturity may threaten population persistence.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of the Dergholm Guinea-flower 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** for recovery of the Dergholm Guinea-flower 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 of 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.	•	Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites.				
	Responsibility: DSE	٠	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.	•	Predictive model for potential habitat developed and tested.				
	Responsibility: DSE						
Specific	objective 3						
Manage	threats to populations						
3.1	Identify disturbance regimes to maintain habitat. Responsibility: DSE	٠	Preparation of management prescriptions for ecological burning.				
3.2	Control potential threats.	•	Identify current threats and their perceived risk.				
	Responsibility: PV	٠	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.	•	Seed bank/regenerative potential quantified.				
	Responsibility: DSE						
4.2	Determine seed germination requirements by conducting laboratory and field trials	•	Stimuli for recruitment/regeneration identified.				
	Responsibility: DSE	٠	Management strategies identified to maintain, enhance or restore processes fundamental to reproduction.				

Action	Description	Performance Criteria					
Specific objective 5							
Determi	ine 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.Biannual census data collected from 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							
Establis	sh populations in cultivation						
6.1	Establish cultivated plants <i>ex situ</i> 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 representing the geographic and genetic range of known plants. 					
6.2	Establish a seed bank and determine seed viability. Responsibility: DSE	Long-term storage facility identified.Seed from target populations in storage.					
Specific	objective 7						
Build co	ommunity support for conservation						
7.1	Identify opportunities for community involvement in the conservation of <i>Hibbertia humifusa</i> subsp. <i>debilis</i> .	Presentation to community nature conservation groups.					
	Responsibility: DSE						

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 the Dergholm Guinea-flower. 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 insure against extinction. Major threats requiring management include accidental destruction, 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 the Dergholm Guinea-flower 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 *Hibbertia humifusa* subsp. *debilis*, 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

All populations of the Dergholm Guinea-flower occur 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 Dergholm Guinea-flower 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 the Dergholm Guinea-flower, 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, as all populations occur on public land (State park) that is managed with nature conservation already a high priority. Any protection measures required will have negligible impact on current recreational and commercial activities there.

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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	\$5,000	\$5,000	\$0	\$0	\$0	\$10,000
4.2	Seed germination	2	75%	DSE	\$0	\$5,000	\$5,000	\$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	\$49,000	\$49,000	\$30,000	\$34,000	\$217,000