

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this Conservation Advice on 01/04/2016.

Conservation Advice

Hibbertia humifusa subsp. *debilis*

Dergholm guinea-flower

Conservation Status

Hibbertia humifusa subsp. *debilis* (Dergholm guinea-flower) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

The main factors that are the cause of the subspecies being eligible for listing in the Vulnerable category are: an area of occupancy of less than 500 km², a very low number of mature individuals with a fragmented distribution and inferred decline in the quality of habitat.

The Dergholm guinea-flower is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988* and as Vulnerable under the non-statutory *Advisory List of Rare or Threatened Plants in Victoria*.

Description

The Dergholm guinea-flower is a small, perennial shrub with branches up to 20 cm that grow horizontally and then rise at the tip (Toelken 1995). Branches bear simple or, rarely, star-shaped hairs below the flowers. Leaves are 4-14 mm long and 1-3 mm wide. Flowers are bright yellow, and borne at the end of a 4-7 mm long, thread-like stalk. Flower bears 1 or 2 bracts at the base or lower third of the stalk (Toelken 1995). The outer sepals are 3.3-3.6 mm long, 1.3-1.5 mm wide, sparsely covered with star-shaped hairs under scattered simple hairs (Toelken 1995).

This subspecies is distinguishable from other subspecies of *Hibbertia humifusa* in having outer sepals that are narrower than *H. humifusa* subsp. *humifusa*, and shorter sepals than *H. humifusa* subsp. *erigens*. *Hibbertia humifusa* subsp. *erigens* also has scattered star-shaped hairs on its branches while *H. humifusa* subsp. *debilis* does not (Toelken 1995).

Distribution

The Dergholm guinea-flower is endemic to Victoria, where it is confined to four populations comprising approximately 200 plants in a small area near Dergholm in the south-west, approximately 350 km west of Melbourne (Carter et al., 2006, DSE 2009). All populations occur within the Dergholm State Park (Carter et al., 2006).

The Dergholm guinea-flower grows on wet heathland (Toelken 1995), co-occurring with *Banksia marginata* (silver banksia), *Epacris impressa* (common heath), and *Hibbertia fasciculata* (bundled guinea-flower). Scattered *Eucalyptus camuldulensis* (river red-gum) and *E. ovata* (swamp gum) comprise a sparse overstorey (Carter et al., 2006).

Relevant Biology/Ecology

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 (Carter et al., 2006). Exposing seed to the sun is an effective germination treatment for other *Hibbertia* species (Fox et al., 1987).

Threats

There is no information on historical distribution and abundance of the Dergholm guinea-flower, and whether the subspecies has declined in abundance or range is unknown (Carter et al., 2006, DSE 2009). No threatening processes have been positively demonstrated to be impacting on the Dergholm guinea-flower. The Dergholm guinea-flower is known to have survived a hot December fire, however, the species' regeneration strategy was not recorded (DSE 2009).

Table 1 – Potential threats to the Dergholm guinea-flower

Threat	Type	Threat status	Evidence base
Habitat loss and fragmentation			
Vehicular movement	Potential	Future	One population occurs close to a fire dam and may be at risk from vehicle movement and earthworks associated with dam maintenance (Carter et al., 2006).
Inappropriate fire regimes			
High frequency	Potential	Future	Fire intervals shorter than the time taken to reach reproductive maturity may threaten population persistence (Carter et al., 2006, DSE 2009).
Disease			
Infection by <i>Phytophthora cinnamomi</i>	Potential	Future	Some <i>Hibbertia</i> species are susceptible to the root pathogen <i>Phytophthora cinnamomi</i> (Murphy & Downe 2006), although its impact on the Dergholm guinea-flower is not known.
Invasive species			
Weed invasion	Potential	Future	Weed invasion is reported to be the greatest threat to almost all populations of Euroa guinea-flower, <i>Hibbertia humifusa</i> subsp. <i>erigens</i> (Murphy & Downe 2006), and possibly threatens the Dergholm guinea-flower.
Grazing and digging by European rabbits (<i>Oryctolagus cuniculus</i>)	Potential	Future	Rabbit grazing and associated land degradation are threats to <i>Hibbertia humifusa</i> subsp. <i>erigens</i> (Euroa guinea-flower) (Murphy & Downe 2006), and may also be a threat to the Dergholm guinea-flower. However, grazing by rabbits is a complex issue, because light grazing may be beneficial in reducing competition from environmental weeds.

Conservation Actions

Conservation and Management priorities

Habitat loss disturbance and modifications

- Prevent habitat disturbance due to development activities, road maintenance, earthworks, or other activities leading to habitat loss or disruption, or having other negative impacts on the Dergholm guinea-flower. Ensure the manager of Dergholm State Park is aware of the subspecies' occurrence and provide protection measures against key and potential threats.
- Manage any other likely, potential or emerging threats to habitat quality, such as grazing, or invasion of weeds.
- If additional populations are found outside Dergholm State Park, ensure land managers are aware of the occurrence of this subspecies and provide protection measures against key and potential threats.
- Fence areas to prevent impacts from activities such as vehicular movement and earthworks.

Breeding, propagation and other *ex situ* recovery action

- Establish populations in cultivation in appropriate institutions such as botanic gardens.
- To manage the risk of losing genetic diversity, undertake appropriate seed collection and storage in national seed banks and determine viability of stored seed. Seeds from all natural populations to be collected and stored.
- Establish additional populations in suitable secure habitat. Implement the national translocation protocols of Vallee et al. (2004).

Invasive species (including threats from grazing, trampling, predation)

- Identify and control any weeds that could threaten the Dergholm guinea-flower using appropriate methods, such as careful use of herbicides or digging and removal. Ensure that the disturbance/overspray associated with these control methods are minimised.
- If grazing by introduced herbivores (e.g. the rabbit, *Oryctolagus cuniculus*) is confirmed, build a network of enclosures around the plants to exclude them.

Disease

- Monitor the Dergholm guinea-flower and nearby members of the Myrtaceae for the presence of *Phytophthora cinnamomi* and other *Phytophthora* species. If detected, minimise the spread by implementing appropriate vehicle and footwear hygiene protocols where possible, and mitigate impacts with phosphite treatments, fumigants, specific vegetation destruction, and containment barriers (Department of the Environment 2014).

Fire

- Fire intervals shorter than the time taken to reach reproductive maturity may threaten population persistence (DSE 2009). Following the results of research into the response of this species to fire, develop and implement a suitable fire management strategy for the habitat of the Dergholm guinea-flower, preventing frequent widespread fires.
- Ensure there is a carefully planned weed management strategy to ensure post-fire monitoring of Dergholm guinea-flower and control actions for weeds are implemented.

- Mark localities where Dergholm guinea-flower occurs onto maps used for planning hazard reduction work.
- Once a suitable fire management strategy becomes known, provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plan/s, risk register and/or operation maps.

Stakeholder Engagement

- Raise awareness of the Dergholm guinea-flower within the local community. Engage with the owners and managers of the Dergholm State Park and encourage these key stakeholders to contribute to the implementation of conservation management actions.
- Engage interested nature conservation, land management and land holder groups in conservation management activities, such as survey and monitoring, and weed management. If necessary, use workshops to aid stakeholders in developing the skills and knowledge required to manage threats to this subspecies.
- Engage with the Australian Plants Society to encourage the cultivation and propagation of this subspecies in plant nurseries in the area.
- Establish a roadside marker system where appropriate. Erect appropriate signage to indicate conservation of individuals or groups of plants.

Survey and Monitoring priorities

- Conduct targeted surveys throughout the range of the Dergholm guinea-flower to better define its distribution and abundance. Accurately identify potentially suitable habitat and undertake survey work to locate and map any additional populations.
- Continue the surveys and density estimates undertaken in Dergholm State Park and Brimboal State Forest (DSE 2009). Establish and maintain a monitoring programme based on these data to:
 - determine trends in population size and distribution, mortality and timing of life history stages;
 - determine threats and their impacts; and
 - monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- Prioritise management actions at all sites based on the currency, degree and nature of threats.
- Undertake research to evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment levels by conducting field based experimental trials (DSE 2009).
- Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli. Determine vegetative propagation trials to determine the requirements for successful establishment. Implement an annual census to monitor emergence and re-sprouting success.
- Determine fire intensity and frequency that promotes recruitment and population persistence of the Dergholm guinea-flower or surrounding native habitat.

References cited in the advice

- Carter, O., Downe, J. & Murphy A. H. (2006). National recovery plan for the Dergholm guinea-flower *Hibbertia humifusa* subspecies *debilis*. Victoria Department of Sustainability and Environment, Melbourne.
- Fox J, Dixon, B. & Monk, D. (1987). Appendix 6 - Germination of other plant families. In 'Germination of Australian native plant seed' (ed PJ Langkamp). Inkata Press, Melbourne.
- Murphy, A. H. & Downe, J. (2006). National recovery plan for the Euroa guinea-flower *Hibbertia humifusa* subspecies *erigens*. Victoria Department of Sustainability and Environment, Melbourne.
- Toelken, H. R. (1995). Notes on *Hibbertia* I. New taxa from south-eastern Australia. *Journal of the Adelaide Botanic Gardens* 16, 59-72.
- Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, M. & Rossetto, M. (2004). Guidelines for the translocation of threatened plants in Australia, 2nd edition. Australian Network for Plant Conservation, Canberra.

Other sources cited in the advice

- Department of the Environment (2014). Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*. Viewed: 19 October 2015. Available on the Internet at: <http://www.environment.gov.au/system/files/resources/bad95d05-3741-4db3-8946-975155559efb/files/threat-abatement-plan-disease-natural-ecosystems-caused-phytophthora-cinnamomi.pdf>
- DSE (Victoria Department of Sustainability and Environment) (2009). Action statement No. 212: Dergholm guinea-flower, *Hibbertia humifusa* subspecies *debilis*. Available on the Internet at: <http://www.depi.vic.gov.au/environment-and-wildlife/threatened-species-and-communities/flora-and-fauna-guarantee-act-1988/action-statements/plants>