



Philotheca freyciana

freycinet waxflower

TASMANIAN THREATENED FLORA LISTING STATEMENT

Image by Tim Rudman

Scientific name: *Philotheca freyciana* Rozefelds, *Muelleria* 15: 23 (2001)

Common name: freycinet waxflower (Wapstra et al. 2005)

Group: vascular plant, dicotyledon, family **Rutaceae**

Status: *Threatened Species Protection Act 1995*: **endangered**

Environment Protection and Biodiversity Conservation Act 1999: **Endangered**

Distribution Endemic status: **endemic to Tasmania**

Tasmanian NRM Regions: **South**



Figure 1. Distribution of *Philotheca freyciana*, showing Natural Resource Management regions



Plate 1. *Philotheca freyciana*: habit (image by Richard Schahinger)

IDENTIFICATION AND ECOLOGY

Philotheca freyciana is a small woody shrub in the Rutaceae family, endemic to granite substrates on Tasmania's Freycinet Peninsula (Rozefelds 2001). Flowers have been observed in autumn (April to May) and also in spring and early summer (September to December). The species is capable of resprouting after drought or browsing, and may recruit from seed; the longevity of any soil seedbank is unknown.

Survey techniques

The species may be identified at any time of year due its distinctive keeled leaves, though is much easier to spot when in flower.

Description

Philotheca freyciana is typically a multi-branched shrub to 1 m high, though leggy single-stemmed plants to 1.6 m have been recorded in sheltered positions. Its leaves are sessile and almost imbricate in appearance, broadly obcordate-obovate in shape and folded through to 90 degrees (the 'keeled' appearance of the leaves may be less pronounced in more sheltered plants). They are 9 to 13 mm long, 8 to 13 mm wide, with prominent tubercular glands on the lower surface, the margins often tinged with red. Flowers are solitary in the axils of the upper leaves, with a 1 to 2 mm long peduncle and 3 to 4 mm long pedicel subtended by four brown bracteoles that are quickly shed; flowers are 5-merous. Sepals semi-orbicular, c. 1 mm long and 1.5 mm wide; petals broadly elliptical, white, pink in bud, 8 to 10 mm long and 4 to 5 mm wide; stamens 10. Seeds are black, shiny and about 4 mm long. (description based on Rozefelds (2001) & pers. obs.)

Confusing Species

The flowers of the allied species *Philotheca virgata* (twiggy waxflower) are 4-merous rather than 5-merous (mostly), lack a peduncle, and its corolla lobes are 5 to 6.5 mm long. The leaves of *Philotheca virgata* are relatively thin and flat (cf. thick and keeled for *Philotheca freyciana*), lack prominent glands on the lower surface, and have mid-ribs that extend into a mucronate tip.

DISTRIBUTION AND HABITAT

Philotheca freyciana has a scattered occurrence through the massive granite monolith known as The Hazards at Freycinet Peninsula, occurring from just above sea level to the higher elevations (10 to 440 m). A solitary plant is known from Cape Tourville, several kilometres to the northeast of The Hazards (Plate 2).

Philotheca freyciana occurs exclusively on Devonian granite, growing in cracks and runnels within the massive granites (Plate 2). The surrounding vegetation is generally a dry open scrub dominated by *Kunzea ambigua* (white kunzea), with *Leptospermum grandiflorum* (autumn teatree), *Calytrix tetragona*, (common fringemyrtle), *Epacris barbata* (bearded heath), *Allocasuarina monilifera* (necklace sheoak), *Dillwynia glaberrima* (smooth parrotpea), *Monotoca submutica* (mountain broomheath) and *Hakea megadenia* (autumn needlebush), and mallee-form eucalypts may also be present.



Plate 2. *Philotheca freyciana* habitat: The Hazards, with the Cape Tourville lighthouse in the middle distance (image by Richard Schahinger)

POPULATION PARAMETERS

At the time of the species' description there were only three live plants known, one at Cape Tourville and two on a large boulder alongside the Mt Amos walking track (Plate 1). However, there were also collections dating to the early 1960s from Mt Amos at higher altitudes (Rozefelds 2001).

Table 1. Population summary for *Philotheca freyciana*

	Subpopulation	Tenure	NRM region *	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of mature plants
1	The Hazards	Freycinet National Park	South	Coles Bay	2016 2011 2002 1961	< 0.2 < 0.2	40–50 60–70
2	Cape Tourville	Freycinet National Park	South	Coles Bay	2016 2000	0.0001 0.0001	1 1

* NRM region = Natural Resource Management region

Targeted surveys in 2001 and 2002 by the Tasmanian Herbarium, the Royal Tasmanian Botanical Gardens, and DPIW's Biodiversity Conservation Branch, located 60 to 70 mature individuals in the Hazards area of the Freycinet National Park, with a further 20 to 30 immature plants, and relocated a solitary plant at Cape Tourville. Plant numbers had declined to fewer than 50 in early 2011, a consequence of long-term drought and browsing pressure (Table 1).

The linear range of *Philotheca freyciana* is 7.5 km, with an extent of occurrence of about 7 km², and an area of occupancy of less than 0.2 ha.

Surveys of potential habitat to the south of Freycinet Peninsula on Schouten Island and Maria Island have failed to locate the species. The chances of finding sites outside the species' known range are considered to be low, though it is expected that additional plants will be found at The Hazards and Cape Tourville, albeit with an intensive survey effort.

RESERVATION STATUS

All known individuals of *Philotheca freyciana* occur in Freycinet National Park.

CONSERVATION ASSESSMENT

Philotheca freyciana was listed as endangered on the Tasmanian *Threatened Species Protection Act 1995* in 2002. It continues to qualify for listing as endangered under criterion D1:

- total population estimated to number fewer than 250 mature individuals.

THREATS AND LIMITING FACTORS

Drought stress and browsing by native animals: Many of the plants observed in the field, particularly those growing from crevices in granite slabs, are of weak stature, and show signs of drought stress and browsing by native animals (Plates 3 & 4). Extended periods of drought or intensification of mammal browsing may lead to local extinctions, with the main concentration of plants (Mt Mayson in the western part of The Hazards), having declined from 50–60 plants in 2002 to about 30 plants in 2011.

Inappropriate fire regimes: Field observations indicate that the species is likely to resprout following fire, though there is no information on the species' specific response to fires of varying intensity, seasonal timing or frequency. Fires at an interval less than the time taken to produce sufficient soil-stored seed or develop a robust resprouting capacity will be detrimental to the species. The last recorded fire through The Hazards was in February 1980.

***Phytophthora cinnamomi*:** Several species in the Rutaceae family in Tasmania are known to be susceptible to this introduced soil-borne plant pathogen (Podger et al. 1990), though the status of *Philotheca freyciana* at the time of its listing in 2002 was unknown. Laboratory trials conducted in 2007–2008 indicate that *Philotheca freyciana* may host the pathogen but is essentially resistant to disease expression (Rudman et al. 2008). However, the pathogen is known to be widespread through The Hazards (Schahinger et al. 2003), and the loss of susceptible flora growing in association with *Philotheca freyciana* has the potential to impact the species indirectly

through changes to the soil's physical and biological properties.

Stochastic events: The small size of the population exposes *Philotheca freyciana* to a risk

of extinction through chance events, especially as the species' ecology is poorly understood.



Plates 3 & 4. Lonny Creek site: 9 October 2002 (left) & 24 September 2016 (right)

MANAGEMENT STRATEGY

The main objectives for the recovery of *Philotheca freyciana* are to prevent the inadvertent destruction of subpopulations, maintain the viability of existing subpopulations, and promote conditions for its successful recruitment.

What has been done?

Monitoring & extension surveys: A joint project between the Tasmanian Herbarium and the Royal Tasmanian Botanical Gardens (RTBG) was initiated in 2001 to address gaps in the understanding of the autecology of *Philotheca freyciana*. Baseline monitoring was established at the Mt Mayson site in 2002, and re-scored in 2004, 2006 and 2011 (the last occasion by volunteers with the Wildcare group Threatened Plants Tasmania). Extension surveys for the species were undertaken in 2001/2002 and again in 2016, the latter resulting in the discovery of several new plants in the Mt Amos area, and striking evidence of the impact of past drought (Plates 3 & 4).

Trials have been conducted by RTBG to establish an effective technique to cultivate *Philotheca freyciana* in order to establish an ex situ holding. Vegetative propagation appears to be

relatively straightforward, with best success with soft-tip and semi-hardwood cuttings, though tissue culture has not proved successful to date. The RTBG currently holds a number of plants in cultivation for seed orchard purposes.

Fire management: Freycinet National Park is subject to a fire management plan that aims to maintain levels of biodiversity and foster the long-term survival of threatened species (Parks & Wildlife Service 2002).

Disease management: The eastern section of The Hazards is included in a *Phytophthora cinnamomi* management area (Schahinger et al. 2003). A dry wash-down station has been established at the eastern end of The Hazards traverse in an attempt to limit the pathogen's spread, and interpretation panels have been installed along walking tracks to inform visitors of its presence and potential impact.

What is needed?

Recovery actions necessary to decrease the extinction risk to *Philotheca freyciana* include:

- research and monitoring to determine the species' recruitment needs and the impacts of drought, browsing and fire;

- survey of potential habitat through The Hazards and the cliff-top zone between Sleepy Bay and Cape Tourville
- fire and disease management for Freycinet National Park that is consistent with the species' conservation;
- maintain an ex situ holding at the Royal Tasmanian Botanical Gardens;
- provide information and extension support to relevant Natural Resource Management Committees, local councils, government agencies and the local community on the locality, significance and management of the known population and potential habitat.

BIBLIOGRAPHY

- Parks and Wildlife Service (2002). *Freycinet Reserves Fire Management Plan*. Department of Primary Industries, Water and Environment, Hobart.
- Podger, F., Palzer, C. & Wardlaw, T. (1990). A guide to the Tasmanian distribution of *Phytophthora cinnamomi* and its effects on native vegetation. *Tasforests* 2: 13–20.
- Rozefelds, A.C. (2001). The Tasmanian species of *Philothea* (Rutaceae). *Muelleria* 15: 19–26.
- Rudman, T., Ilowski, M. & Schahinger, R. (2008). The susceptibility to *Phytophthora cinnamomi* of the threatened species *Boronia gunnii*, *Boronia hemichiton*, *Boronia hippopala* and *Philothea freyciana*. Nature Conservation Report 08/05, Biodiversity Conservation Branch, Department of Primary Industries and Water, Hobart.
- Schahinger, R., Rudman, T. & Wardlaw, T. (2003). *Conservation of Tasmanian Plant Species and Communities threatened by Phytophthora cinnamomi*. Nature Conservation Branch Technical Report 03/03, Department of Primary Industries, Water and Environment, Hobart.
- Wapstra, H., Wapstra, A., Wapstra, M. & Gilfedder, L. (2005). *The Little Book of Common Names for Tasmanian Plants*. Department of Primary Industries, Water and Environment, Hobart

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Contact details: Threatened Species Section, Department of Primary Industries, Parks, Water and Environment, GPO Box 44 Hobart Tasmania Australia 7001. Ph. (03) 61654340. threatenedspecies.enquiries@dpipwe.tas.gov.au

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