Image by Greg Jordan

Epacris barbata

bearded heath

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: ***Epacris barbata*** Melville, *Kew Bull.* 7: 176 (1952)

Common Name: bearded heath (Wapstra et al. 2005)

Group: vascular plant, dicotyledon, family **Epacridaceae** (now Ericaceae)

Status: *Threatened Species Protection Act 1995*: **endangered**
Environment Protection and Biodiversity Conservation Act 1999: **Endangered**

Distribution: Endemic status: **endemic to Tasmania**
Tasmanian NRM Region: **South**

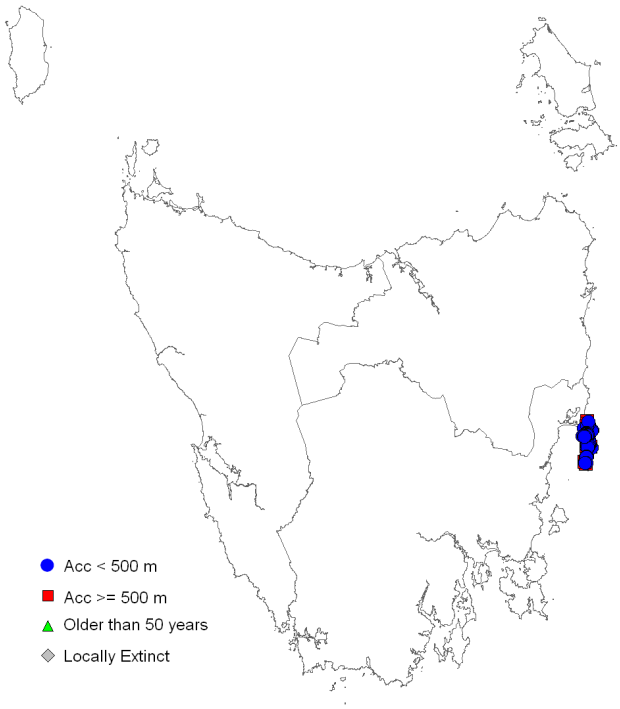

Figure 1. Distribution of *Epacris barbata*, showing Natural Resource Management regions

Plate 1. Growth habit and flowers of *Epacris barbata* (image by Greg Jordan)

SUMMARY: *Epacris barbata* (bearded heath) is a shrub, occurring exclusively on Devonian granite in open heath and heathy woodland/forest on the Freycinet Peninsula and Schouten Island in Tasmania. The total number of mature individuals is estimated at about 100,000 and the species has a restricted distribution with a linear range of only 29 km, putting the species at risk from localised events. While the species is wholly reserved, with most occurrences in Freycinet National Park, threats include infection by the exotic soil-borne plant pathogen *Phytophthora cinnamomi* and inappropriate fire regimes.

IDENTIFICATION AND ECOLOGY

Epacris barbata commences flowering in early spring and is complete by late spring. Known pollinators of *Epacris* taxa include a variety of adult carrion flies from the families Tabanidae, Muscidae and Calliphoridae (Keith 1998). Fruit production for *Epacris* taxa depends on plant size, fire history and shading by the canopies of neighbouring plants, with up to several thousand seeds produced each year (Keith 1998). Fruit production is substantially reduced in shaded plants, with high rates of abortion among developing fruits. Other fruit losses may result from predation, browsing herbivores and mechanical damage.

Seed of *Epacris barbata* are dispersed in summer (Keith 2004). Dispersal of *Epacris* seeds is passive, and few seed are likely to be dispersed more than a few metres from their parent plant (aside from those close to creeklines). The longevity of *Epacris* seed is unknown, though Keith (1998) indicates that appreciable numbers of seed may survive for two years after release into the seed bank. Seed remains dormant until released by heat shock and smoke-related cues associated with the passage of fire (Keith 2004).

The generation length for *Epacris barbata* is likely to be in the range 8 to 30 years, and longevity around 60 years (Keith 2004). Individuals of *Epacris barbata* are known resprout after fire though there is little information on the specific response to the intensity or timing of fire.

Survey techniques

Surveys for *Epacris barbata* can be conducted at any time of the year, though the species is more easily detected in September to November when flowers are present. Care should be taken when conducting surveys to avoid spreading *Phytophthora cinnamomi* by surveying in dry conditions and ensuring that footwear and all field equipment is disinfected.

Description

Epacris barbata is an erect multi-stemmed shrub growing up to 2 m tall. Its branches are robust, bearing thick recurved lanceolate leaves, 7 to 9.5 mm long and 3 to 5 mm wide, with short stalks (less than 1 mm long), a pungent apex and a conspicuous mid-vein on the lower surface. Flowers are white, solitary in the leaf axils, subsessile and clustered at the ends of branches. The style is 5 to 6.5 mm long and the stigma and anthers are half-exserted from the corolla tube which is 4 to 5.5 mm long and has five lobes that are 5 to 6.5 mm long. The sepals are densely pubescent.

[description based on Curtis 1963 & Keith 1998]

Confusing species

Epacris barbata may be distinguished from other *Epacris* species in Tasmania by its densely pubescent sepals, large floral parts and a style that is half-exserted from the corolla tube (Curtis 1963, Crowden & Menadue 2001).

DISTRIBUTION AND HABITAT

Epacris barbata is endemic to Tasmania, being restricted to the Freycinet Peninsula and Schouten Island on the State's east coast (Figure 1). The species occurs exclusively on Devonian granite in open heath and heathy woodland/forest in hilly and low-lying terrain from 30 to 500 m elevation (Keith 1997), growing in either shallow sandy loams or skeletal soils among rocky outcrops (Keith 1998; Plates 2 and 3).

Plate 2. *Epacris barbata* in its shallow sandy loam habitat at Middleton Creek, and grass trees impacted by *Phytophthora* (image by Richard Schahinger)

Plate 3. *Epacris barbata* in its rocky outcrop habitat at Mt Parsons (image by Richard Schahinger)

POPULATION PARAMETERS

Epacris barbata has been recorded from 16 subpopulations where individual subpopulations have been presumed to be discrete patches separated by discontinuities of at least 0.5 km (Keith 2004). Due to the widespread distribution of the threatening plant pathogen *Phytophthora cinnamomi,* these effectively represent two locations, Freycinet Peninsula and Schouten Island (Table 1). The species has a linear range of 29 km, an extent of occurrence of 120 to 125 km^2, and an area of occupancy of about 150 hectares (Table 1).

The total population size is estimated to be in the order of 100,000 mature individuals (Table 1) though this estimate should be viewed as approximate only, due to the limitations involved in surveying for a species that has a patchy distribution in a highly dissected landscape (Plate 3). The number of individuals within subpopulations is likely to fluctuate considerably due to the mass germination of soil-stored seed following the passage of fire (Keith 2004).

Given the level of past survey efforts and habitat preference of *Epacris barbata*, the likelihood of detecting subpopulations outside the current extent of occurrence is considered to be extremely low.

RESERVATION STATUS

All bar one of the known sites of *Epacris barbata* are in Freycinet National Park. The other is in Coles Bay Conservation Area (Table 1).

CONSERVATION ASSESSMENT

Epacris barbata was listed as endangered on the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being, meeting criterion B: extent of occurrence estimated to be less than 500 km^2, and

- known to exist at no more than five locations;
- a continuing decline, inferred, observed or projected in area, extent and/or quality of habitat, and number of mature individuals.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

***Phytophthora cinnamomi*:** *Epacris barbata* is highly susceptible to the introduced soil-borne plant pathogen *Phytophthora cinnamomi* (Barker 1994, Keith 1998). Scattered *Phytophthora* infestations occur throughout the species' range, with highest mortalities recorded in the species' shallow sandy loam habitat (Keith 2004). The pathogen may be spread locally by the movement of soil water and hyphal growth, with dispersal between sites in soil transported by walkers, vehicles and native animals. Two of the smaller subpopulations (4 & 5 in Table 1) are close to existing roads traversed by tourist and management vehicles, while the other subpopulations are within areas accessible only

Table 1. Population summary for *Epacris barbata*

	Location	Tenure	NRM Region	1:25000 Mapsheet	Year last assessed	Area occupied (ha)	Number of individuals
1.1	Friendly Point	Freycinet National Park	South	Friendly	2003	0.2	200
1.2	Middleton Creek	Freycinet National Park	South	Coles Bay	2013	1.3	12,230
1.3	Coles Bay tip	Coles Bay Conservation Area	South	Coles Bay	2005	0.5	800–1000
1.4	Cape Tourville	Freycinet National Park	South	Coles Bay	2001	0.1	20
1.5	Sleepy Bay Road & Coles Bay Road	Freycinet National Park	South	Coles Bay	2003	0.1	65
1.6	Mt Parsons & Mt Baudin	Freycinet National Park	South	Coles Bay	2013	9.1	3,880
1.7	Mt Dove	Freycinet National Park	South	Coles Bay	2001	2.4	1,040
1.8	Mt Amos	Freycinet National Park	South	Coles Bay	2001	3.9	7,850
1.9	Mt Mayson	Freycinet National Park	South	Coles Bay	2001	8.4	3,390
1.10	Lonney Creek	Freycinet National Park	South	Coles Bay	2002	0.0001	9
1.11	South Wineglass Bay	Freycinet National Park	South	Graham	2001	11	14,700
1.12	Mt Graham	Freycinet National Park	South	Graham	2001	0.0005	10
1.13	Gates Bluff	Freycinet National Park	South	Graham	1996	0.1	20
1.14	Callitris Creek	Freycinet National Park	South	Graham	1996	0.02	300
1.15	Cape Degerando	Freycinet National Park	South	Schouten	2001	3.6	2,220
2	Schouten Island	Freycinet National Park	South	Schouten	2005	c. 120	c. 50,000

NRM Region = Natural Resource Management Region

to bushwalkers. Keith (2000) observed mean rates of decline of 23% per year, 4% per year, 17% per year and 17% per year at diseased sites within subpopulations 1.2, 1.5 and 1.14 on the Freycinet Peninsula, and on Schouten Island, respectively, and used that data to infer a projected population decline for the species of 99% over three generations. More recent surveys indicate that the rate of decline is likely to be considerably less than the above estimates, especially in the species' rocky outcrop habitat.

Inappropriate fire regimes: Over-frequent or infrequent burning both pose a potential threat to *Epacris barbata*. Fire intervals of less than 8 years may lead to a decline in population sizes by preventing seedlings from reaching maturity, while intervals greater than 30 years may result in senescence (Keith 2004). The recent fire history of the species' habitat in Freycinet National Park is characterised by occasional extensive wildfires arising from acts of arson or accident, with some small areas subject to ecological burns (Parks & Wildlife Service 1995, 2002).

Climate change: A warmer climate and longer periods of drought may impact deleteriously on *Epacris barbata* and its habitat, possibly through reducing recruitment following fire. An increased fire frequency due to climate change may also prove to be detrimental to the species. The risk to the species is exacerbated by its restricted distribution.

MANAGEMENT STRATEGY

Management objectives

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

What has been done?

Recovery planning: *Epacris barbata* is included in the *Flora Recovery Plan: Threatened Tasmanian Forest Epacrids* (Threatened Species Section 2011).

***Phytophthora cinnamomi* management:** Subpopulations 1.6, 1.7 & 1.8 within Freycinet National Park (Table 1) have been included in a *Phytophthora cinnamomi* management area (Schahinger et al. 2003). While the pathogen is already scattered throughout the management area, a dry washdown station has been installed at the Sleepy Bay end of the Hazards to reduce the risk of further disease spread by bushwalkers. An interpretation panel and pamphlets dealing with *Phytophthora* issues is available to park visitors at the Freycinet National Park visitor centre at Coles Bay.

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).

Surveys: Targeted surveys for *Epacris barbata* were undertaken in the mid-1990s as part of projects focussing on species threatened by *Phytophthora cinnamomi* (Barker 1994, 1996), as well as during development of the *Tasmanian Forest Epacrids Recovery Plan* (Keith 1997, 1998). Extension surveys were also undertaken during the Recovery Plan's implementation phase from 1999 to 2002. Additional surveys of potential habitat on Schouten Island were undertaken in late 2004 and 2005 (Rudman & Schahinger 2006). While 11 subpopulations of *Epacris barbata* were confirmed in 1996 (Keith 1998), a further five have been discovered in the interim (1.3, 1.6, 1.7, 1.9 and 1.15 in Table 1), with considerable expansions to the known subpopulation on Schouten Island.

Monitoring: The response of *Epacris barbata* to *Phytophthora cinnamomi* has been monitored from 1995 to 2002 at two sites, Middleton Creek (subpopulation 1.2) and Bear Hill on Schouten Island (Barker 1996, Keith 2000, 2004).

***Ex situ* conservation:** An *ex situ* living plant collection has been established at the Royal Tasmanian Botanical Gardens in Hobart. Seed has been collected from two subpopulations for long-term storage at the Tasmanian Seed Conservation Centre based at the Royal tasmanian botanical gardens (J. Wood, pers. comm.).

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- review the efficacy of the existing *Phytophthora* management area in Freycinet National Park;
- update and implement fire management plans for Freycinet National Park and prepare and implement a fire management plan for the Coles Bay Conservation Area;
- monitor the species' response to fire and disease to guide future recovery work;
- increase the awareness of visitors to the Freycinet National Park of the threat of *Phytopthora cinnamomi* to the species;
- provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations;
- supplement the seed collection held at the Tasmanian Seed Conservation Centre.

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