propeller plant

Stenanthemum pimeleoides

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name: ***Stenanthemum pimeleoides*** (Hook.f.) Benth., *Fl. Austral.* 1: 436 (1863)

Family: Rhamnaceae

Common Name: propeller plant (Wapstra *et al.* 2005)

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Vulnerable**
Tasmanian Regional Forest Agreement 1997: **Priority species**

Distribution: Endemic status: **Endemic to Tasmania**
Tasmanian NRM Region: **North & South**

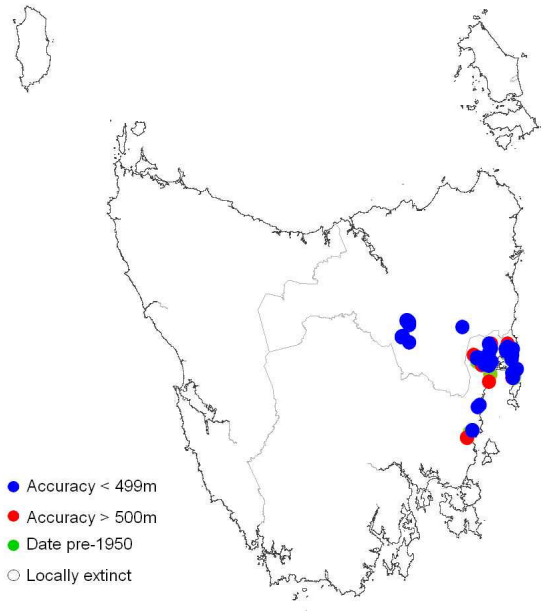

Figure 1. Distribution of *Stenanthemum pimeleoides.*

Plate 1. *Stenanthemum pimeleoides* (Photograph: R. Schahinger).

IDENTIFICATION AND ECOLOGY

Stenanthemum pimeleoides is a small mat-forming prostrate woody undershrub in the Rhamnaceae (or buckthorn) family. It has small rounded leaves that are shiny dark green above and slightly hairy underneath, and clusters of stalkless white flowers surrounded by brown bracts and two or three conspicuous white 'floral leaves'.

Flowering may occur from November through to February, with a peak in December (Coates 1991a). Flowers are insect pollinated and self-incompatible (Coates 1991b). Old flower heads from the previous season remain on plants following the flowering period and do not begin to produce fruit until the following winter, with fruit maturing from October to January and plants releasing seed in January and February.

Surveys may be undertaken at any time of year. However, any survey efforts need to take into account the species' diminutive nature and the difficulties involved in identifying potentially heavily browsed specimens.

Stenanthemum pimeleoides is known to resprout following fire and germinate prolifically from soil-stored seed (Parks and Wildlife Service 2002). Coates (1991a) noted that *Stenanthemum pimeleoides* was absent from grassy forests, generally being a component of a shrubby understorey consisting of plants from the Fabaceae and Epacridaceae families. Anecdotal evidence from Victoria was cited to suggest that these species and *Stenanthemum pimeleoides* would eventually be replaced by grasses in the continued absence of fire beyond about 15 years.

Description

Stenanthemum pimeleoides has branches 15 to 30 cm long (Curtis & Morris 1975). Its leaves are about 6 mm long, obovate with a blunt apex and have a tomentose lower surface. Flowers are about 2 mm in diameter, and are arranged in small dense, compound terminal heads, with 2 to 3 conspicuous floral leaves that are similar to the foliage leaves but larger and white-tomentose. The receptacle is hirsute, 4 mm long and very slender, constricted above the ovary, with the upper part often breaking away when the fruit ripens. Seeds are small and hard, with a prominent aril at the point of attachment.

Confusing Species

Stenanthemum pimeleoides has a habit and appearance superficially similar to that of another member of the Rhamnaceae family, the Tasmanian endemic *Spyridium obcordatum* (creeping dustymiller). It differs in its smaller flowers, about 2 mm compared with 3 mm for *Spyridium obcordatum*, and the presence of 2 to 3 conspicuous floral bracts compared with 1 floral leaf per flower head (Kirkpatrick *et al.* 1980).

DISTRIBUTION AND HABITAT

Stenanthemum pimeleoides is endemic to Tasmania, occurring along Tasmania's Central East Coast and also in the Northern Midlands (Curtis & Morris 1975, Kirkpatrick *et al.* 1980, Coates 1991a & b). The species has a linear range of 97 km, an extent of occurrence of 4050 km^2, and an area of occupancy of about 32 ha (based on quantitative estimates for 10 of the 22 extant subpopulations, see Table 1).

Stenanthemum pimeleoides grows in dry sclerophyll forest or woodland with an open heathy or shrubby understorey (Coates 1991a & b). It usually occurs in woodlands dominated by either *Eucalyptus amygdalina* (black peppermint) or *Eucalyptus* aff. *pulchella* (colloquially known as 'half-barked amygdalina'; Duncan & Brown 1985), with *Allocasuarina littoralis* (black sheoak) and *Eucalyptus viminalis* (white gum) common co-dominants.

The species shows no particular geological fidelity, being associated with Tertiary gravels, Devonian granite, Jurassic dolerite and Quaternary sands (Coates 1991a), while topography tends to be flat to gently sloping.

The species occurs in the drier parts of the State, within the 500 to 800 mm isohyets, and usually at altitudes below 100 m asl (Coates 1991b).

Table 1. Population summary for *Stenanthemum pimeleoides*.

	Subpopulation	Tenure	NRM Region *	1:25000 mapsheet	Year last seen	Area occupied (ha)	No. of mature plants	Specific threats
1	**Epping Forest**	Tom Gibson Nature Reserve, Private Land Reserves, Private Land	North	Cleveland	2008	18	16,436	Clearance (part only), lack of disturbance
2	**Isis Hills**	Private Land	North	Conara	1999			Clearance
3	**St Pauls Dome Road**	Private Land	North	St Pauls dome	1997			Clearance
4	**Old Coach Road**	Private Land	South	Apslawn	1996	0.08	9	Clearance
5	**Swan River north**	Private Land	South	Apslawn	1990			Clearance
6	**Swan River south**	Private Land	South	Apslawn	1996			Clearance
7	**Cygnet River** (Tasman Hwy)	Private Land	South	Cranbrook	1996	1.0	642	Clearance
8	**Grange Hills**	Private Land	South	Cranbrook	1984			Clearance
9	**Wye River** (Tasman Hwy)	Private Land	South	Cranbrook	1992			Clearance
10	**Lake Leake Road**	Wye River State Reserve	South	Leake	1996	2.5	1,150	Lack of disturbance
11	**Grange Road**	Private land reserve, private, Crown	South	Cranbrook	2006		1,882	Clearance (part only)
12	**Apsley River**	Private Land Reserve	South	Lodi	1996	0.10	18	Lack of disturbance
13	**Mills Marsh**	Freycinet National Park	South	Lodi	2008	2.0	917	Native browsing
14	**Hills Creek**	Freycinet National Park	South	Lodi	1998			Native browsing
15	**Moulting Lagoon**	Game Reserve	South	Lodi	2008	7.5	3,500	Native browsing
16	**Isaac Point**	Freycinet National Park	South	Lodi	2005	0.0001	2	Native browsing
17	**Friendly Beaches**	Freycinet National Park	South	Friendly	2002			Native browsing
18	**Middleton Creek**	Freycinet National Park	South	Coles Bay	2008	0.005	60–80	Native browsing
19	**Saltwater Creek**	Coles Bay Conservation Area	South	Coles Bay	2008	0.01	20–25	Native browsing
20	**Fisheries**	Freycinet National Park	South	Coles Bay	2008	0.00001	4	Native browsing
21	**Little Swanport**	Private Land	South	Lisdillon	1999	0.02	100	Clearance
22	**Triabunna**	Coastal Reserve[#]	South	Triabunna	1999	0.0002	5	Weeds, lack of disturbance
23	**Orford**	Private Land	South	Orford	1952	Presumed extinct		

* NRM region = Natural Resource Management region.
[#] Reserve status assessed under the Crown Land Assessment and Classification project, DPIW.

POPULATION ESTIMATE

The population size is estimated to be greater than 24,700 mature individuals for the 14 subpopulations for which counts are available. The size of the largest subpopulation is estimated to be greater than 16,400 mature individuals. There are no quantitative data for the remaining 8 subpopulations (Table 1).

RESERVATION STATUS

Reserved within Freycinet National Park, Tom Gibson Nature Reserve, Wye River State Reserve, Coles Bay Conservation Area, and Moulting Lagoon Game Reserve.

CONSERVATION ASSESSMENT

Stenanthemum pimeleoides was listed as vulnerable in 1995 under the Tasmanian *Threatened Species Protection Act 1995*. It qualifies under criterion B as it is estimated to occupy less than 50 hectares, it is severely fragmented and there is an inferred continuing decline in area, extent and/or quality of habitat and number of subpopulations and mature individuals.

The species was listed as Endangered on the original schedules of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, and downlisted to Vulnerable in November 2008 following a review of its status as part of a Species Information Partnership between the Australian and Tasmanian Governments. The species was judged to be eligible under criterion 2: ' … geographic distribution of this species is limited, and is precarious for its survival given ongoing threats'.

Stenanthemum pimeleoides is a priority species requiring consideration under the *Tasmanian Regional Forest Agreement* between the Commonwealth of Australia and the State of Tasmania (RFA 1997, DPIWE 1998).

THREATS AND LIMITING FACTORS

The major threats to *Stenanthemum pimeleoides* were identified by Coates (1991b) as land clearance, inappropriate fire regimes, and grazing from domestic and native animals.

Land Clearance: Coates (1991a) voiced the opinion that the 'clearing of dry open forest on sandstone especially in the Central East Coast area has undoubtedly destroyed many *Stenanthemum pimeleoides* populations'. This is considered a reasonable claim given the known loss of potential habitat since European settlement and the current widely scattered distribution of the species, though there is no way of knowing how many subpopulations have been lost. A similar scenario also exists in Tasmania's Northern Midlands.

There has been a considerable increase in intensive agriculture on private land through the Central East Coast region of Tasmania over the past decade, primarily for walnuts, vines and olives, as well as residential expansion around existing towns. The result has been an increasingly fragmented habitat for species such as *Stenanthemum*. Those subpopulations on private land are considered to be at some risk due to a continued expansion of such activities over the next decade.

Inappropriate fire regimes: Johnson and Barker (1998) commented that the most important aspect in managing *Stenanthemum pimeleoides* (on public land) was to avoid frequent low-intensity burning. Coates (1991a) had noted that a fire frequency of less than 15 years may eliminate *Stenanthemum pimeleoides* from a site, and noted also that frequent hazard reduction burns in the Orford area are thought to have led to the demise of at least some occurrences. Those subpopulations within formal reserves are considered to be under threat from a lack of fire, with only 2 or 3 subpopulations within areas earmarked for ecological burns in the next decade.

Heavy grazing pressure (exotic and native): Kirkpatrick (1991) considered that 'grazing pressure and natural or artificial disturbance are required to maintain this species in competition with vigorous native grasses', though it is clear that heavy grazing by sheep and cattle is detrimental to the species (Coates 1991a & b). Those occurrences on private land not covered by conservation covenants are liable to be affected detrimentally by inappropriate stocking levels.

The Parks & Wildlife Service (2002) indicated that heavy grazing by native marsupials may be a factor in limiting the regeneration of the species for those small occurrences within Freycinet National Park and adjacent reserves. This echoes the observation of Kirkpatrick and Harris (1999) that '*Stenanthemum pimeleoides* has been almost eliminated from the Friendly Beach heaths by high levels of marsupial grazing'. The issue of grazing by native marsupials is considered to be less of an issue on private land due to past and ongoing culling, at least for the Northern Midlands subpopulations.

Stochastic risk of extinction: Six of the 12 subpopulations for which data are available support 100 or fewer mature plants (Table 1), thus exposing them to unforeseen stochastic events.

MANAGEMENT STRATEGY

The main objective for the recovery of *Stenanthemum pimeleoides* is to prevent the inadvertent destruction of subpopulations, maintain the viability of existing subpopulations, and promote conditions for its successful recruitment.

What has been done?

The *Stenanthemum pimeleoides Flora Recovery Plan: Management Phase* (Coates (1991b) identified the need 'to extend the reservation status of the species so that populations are represented over their entire geological range'.

A multi-species Recovery Plan for selected Tasmanian forest-associated plants, including *Stenanthemum pimeleoides,* was prepared by Forestry Tasmania in 1998 (Barker & Johnson 1998). The Commonwealth did not formally adopt this plan, though sections of the Plan have been implemented by various Tasmanian agencies. The *Draft Greater Freycinet Region Threatened Species Recovery Plan 2006–2010* (Threatened Species Section 2006) expanded upon Barker & Johnson (1998).

The following progress has been made towards the aforementioned recovery objectives:

Reservation Status: The species reservation status has been improved with the proclamation of additional areas of public land: Freycinet National Park (subpopulations 13, 14, 16 to 18), Coles Bay Conservation Area (19), the Wye River State Reserve (10), and the Moulting Lagoon Game Reserve (15). Representative subpopulations from each of the major geological substrates are now formally reserved.

Private land reserves: Private land supporting *Stenanthemum pimeleoides* has been protected under Conservation Covenants developed between the Crown and private landowners (parts of subpopulations 1 and 11; promulgated by the Private Forest Reserves Program, DPIWE, Hobart), while an additional private land site is managed specifically for nature conservation by the Australian Bush Heritage Fund (subpopulation 12).

Ecological burns: An ecological burn of known habitat was undertaken by the Tasmanian Parks and Wildlife Service in the Tom Gibson Nature Reserve in May 2003, with good regeneration of the species observed post-fire. Burns are also planned for parts of at least two subpopulations in the Freycinet National Park and Coles Bay Conservation Area during the period 2002 to 2012 (Parks and Wildlife Service 2002).

Roadside management: Roadside occurrences near the Tasman Highway – Lake Leake road junction are subject to a management agreement between DPIW and the Tasmanian Department of Infrastructure, Energy and Resources.

Monitoring: University of Tasmania personnel in association with the Tasmanian Parks and Wildlife Service have undertaken monitoring of the species' response to fire and grazing at the Tom Gibson Nature Reserve (Parks & Wildlife Service 1996).

What is needed?

Recovery actions necessary to decrease the extinction risk to *Stenanthemum pimeleoides* include:

- Provision of adequate information and extension services to relevant Natural

Resource Management Committees, Local Councils, Government Agencies and the local community on the locality, significance and management of known subpopulations and the management of potential habitat of *Stenanthemum pimeleoides*

- Provision of technical assistance to the Private Land Conservation Program (DPIW) for the protection and management of sites on private land, including the fencing of important subpopulations to reduce grazing pressure.
- Establishment of permanent survey plots at selected subpopulations, with monitoring to be undertaken at two-year intervals to gauge the impact of fire and/or browsing.
- Collection of seed for conservation storage as part of the Tasmanian Seed Safe project set up under the Millennium Seed Bank project being conducted under the auspices of the Royal Botanic Gardens Kew (joint partners in Tasmania include DPIW, the Royal Tasmanian Botanical Gardens and the Tasmanian Herbarium).
- Re-survey known sites that have not been surveyed in the last decade and undertake extension surveys of potential habitat on both public and private land.

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View:
http://www.dpiw.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species Section, Department of Primary Industries & Water, GPO Box 44, Hobart, Tasmania, Australia 7001. Ph (03) 6233 6556; fax (03) 6233 3477.

Permit: It is an offence to collect, disturb, damage or destroy this species unless under permit.