

Micranthemum serpentinum

western tridentbush

TASMANIAN THREATENED FLORA LISTING STATEMENT



Image by Rob Wiltshire

Scientific name: *Micranthemum serpentinum* Orchard, *Aspects of Tasmanian Botany*: 60 (1991)

Common Name: western tridentbush (Wapstra et al. 2005)

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

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

Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic: **Tasmanian endemic**

Tasmanian NRM Regions: **Cradle Coast**

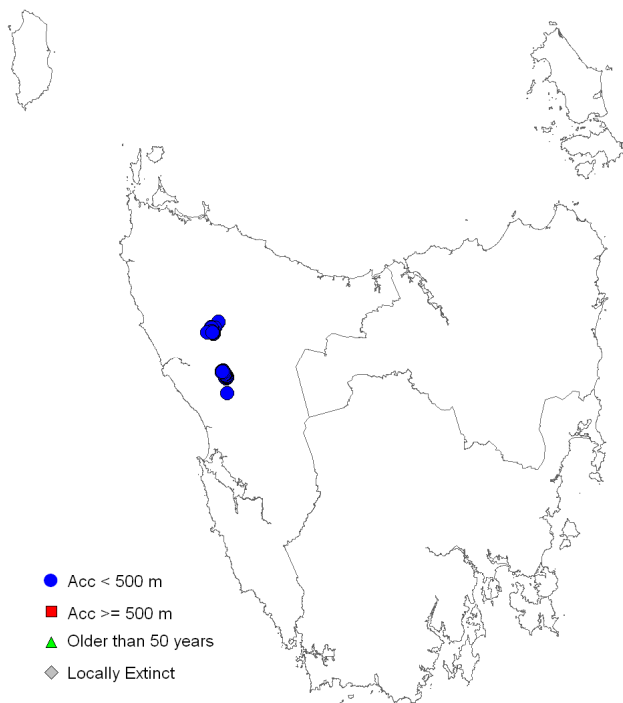


Figure 1. Distribution of *Micranthemum serpentinum* in Tasmania, showing NRM regions



Plate 1. *Micranthemum serpentinum* with immature fruit (image by Richard Schahinger)

SUMMARY: *Micrantheum serpentinum* is a straggly shrub in the Euphorbiaceae (spurge) family, restricted to ultramafics (Cambrian serpentinite) in Tasmania's northwest. Habitat includes open low eucalypt woodland, shrubland and heathland, generally on lateritic soils, in a region with mean annual rainfalls exceeding 2000 mm. The main threat to the species is mineral exploration and extraction. The prolonged absence of fire also poses a threat, with localised impacts due to weed infestations and the construction and maintenance of roads and power easements.

IDENTIFICATION AND ECOLOGY

Micrantheum serpentinum flowers from September to early November, with fruit maturing by mid-January (Orchard 1991). Pollinators are unknown. Dispersal of seed occurs via explosive dehiscence from its fruit, with few seeds likely to be dispersed more than a few metres from their parent plant (aside from those on plants close to creeklines). The longevity of seed is unknown.

The species is known to be capable of colonising disturbed areas, such as roadside verges and quarries; its response to fire is unknown.

Survey techniques

Surveys for *Micrantheum serpentinum* can be undertaken at any time of year due to species' distinctive foliage.

Description

Micrantheum serpentinum is a much-branched, straggly shrub to 2 m tall. Its leaves occur in groups of three at alternately arranged nodes; they range in shape from oblong, narrowly ovate to narrowly obovate, are 5 to 9 mm long and 1.5 to 3.3 mm wide, leathery, concave, dark sub-glossy green above and paler below, glabrous aside from minute hairs on the margins near the rounded apex (which is usually minutely apiculate or very minutely notched). Plants are monoecious, that is, separate male and female flowers occur on the same plant. The yellowish to greenish coloured flowers occur singly in the axils of the upper

leaves, with the male flowers usually above the female flowers. Flowers have perianth segments less than 2.5 mm long, and are usually flushed red in parts; the male flowers have six stamens and a vestigial ovary, and the female flowers have three styles. The fruit is an oval-shaped capsule 3 to 3.3 mm long, yellow-brown in colour with the persistent purplish-black styles at its apex; the capsule has three locules, each with two ovules. Seeds are glossy, pale, creamy-brown, oblong to suborbicular, c. 2 mm long. (description from Orchard 1991)

Confusing Species

Micrantheum hexandrum is the only other species of *Micrantheum* in Tasmania. It is a shrub to 3 m tall growing in riparian habitats in Tasmania's northeast: the closest recorded occurrence to *M. serpentinum* is near Deloraine (a separation of c. 100 km). The leaves of *M. hexandrum* are entirely glabrous, are generally longer and narrower than those of *M. serpentinum*, and have an acute apex. *Micrantheum serpentinum* is strictly monoecious, whereas for *M. hexandrum* some plants may bear male flowers only (Orchard 1991).



Plate 2. *Micrantheum serpentinum* habit
(image by Paul Black)

DISTRIBUTION AND HABITAT

Micrantheum serpentinum is endemic to northwestern Tasmania (Figure 1). It is restricted to Cambrian ultramafics (Gibson et al. 1992), with three main locations: Serpentine Hill and Serpentine Ridge (both in the vicinity of Renison Bell), and the Heazlewood River area between Luina and Savage River.

The species grows in shrubby open low eucalypt woodland dominated by *Eucalyptus nitida* or *Eucalyptus nebulosa* (Gray 2008), shrubland or heathland, typically on rocky hillsides (Orchard 1991), but may also occur on more poorly-drained sites (North et al. 1998). Associated species may include *Acacia mucronata*, *Allocasuarina zephyrea*, *Banksia marginata*, *Bauera rubioides*, *Gabnia grandis*, *Gymnoschoenus sphaerocephalus*, *Hakea epiglottis*, *Lepidosperma elatius*, *Leptospermum glaucescens*, *Leptospermum scoparium*, *Pultenaea juniperina*, *Sprengelia incarnata*, *Spyridium gunnii* and *Westringia rubiaefolia*, with the EPBC-listed *Epacris glabella* present at all three locations. Lateritic soils are associated with the ultramafics at each location (Gibson et al. 1992).

The elevation range of known sites is 110 to 480 m above sea level, and the mean annual rainfall is in excess of 2000 mm. The species' recorded occurrences have a linear range of 47 km and extent of occurrence c. 230 km²; reliable estimates of the area of occupancy are not available.

POPULATION PARAMETERS

Micrantheum serpentinum is known in Tasmania from three subpopulations, as represented by occurrences in three disjunct ultramafic regions: Serpentine Hill, Serpentine Ridge and Heazlewood River (Table 1). The species has been described as being 'locally abundant' and 'widespread' within its ultramafic habitat (Orchard 1991, North et al. 1998), though there are few quantitative estimates for either plant numbers or area of occupancy.

The area of ultramafics in the three regions has been estimated at 250 ha, 2700 ha and 3200 ha, respectively (Gibson et al. 1992). Perhaps half to two-thirds of this area represents potential habitat for *Micrantheum serpentinum* in the form of eucalypt woodland, scrub or heath — the greater proportion of this area has yet to be surveyed in detail.

Table 1. Populations of *Micrantheum serpentinum* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	Serpentine Hill	State Forest	Cradle Coast	Dundas	2012 (1976)	10–15	10,000+
2	Serpentine Ridge	State Forest & Meredith Range Regional Reserve	Cradle Coast	Rosebery Parsons	2012 (1988)	unknown	10,000s?
3a	Heazlewood River (Bronzite Hill)	Savage River Regional Reserve	Cradle Coast	Waratah	1988 (1988)	unknown	unknown
3b	Heazlewood River (Burgess Hill)	State Forest	Cradle Coast	Waratah	1990 (1990)	unknown	unknown
3c	Heazlewood River (Roaring Magg Creek – Gabbro Hill – Brassey Hill)	State Forest & Savage River Regional Reserve	Cradle Coast	Donaldson Savage River	2010 (1990)	unknown	unknown
3d	Heazlewood River (Duffs Hill – Heazlewood Hill)	Heazlewood Conservation Area	Cradle Coast	Savage River	1995 (1989)	unknown	unknown
3e	Heazlewood River (south-central)	State Forest or Savage River Regional Reserve	Cradle Coast	Savage River	1990s?	roadside occurrence	unknown
3f	Heazlewood River (southwest)	State Forest or Savage River Regional Reserve	Cradle Coast	Savage River	1990 (1990)	roadside occurrence	unknown

Note: Species first collected in the Heazlewood River area in 1930 by H.F. Comber (Tasmanian Herbarium: HO 6315)

New records for *Micrantheum serpentinum* since its listing on the TSP Act in 1995 have mostly been a result of surveys associated with mineral exploration. Surveys in the Serpentine Ridge area since 2007 have shown the species to be more-or-less continuous over a distance of at least 6 km; c. 3000 plants were recorded in an area of about 0.4 in the far south, but other records are generally qualitative in nature. Plant numbers were estimated for part of the Serpentine Hill subpopulation in 2004, with a conservative estimate of 10,000 plants in 10 to 15 ha area (data held by the Threatened Species Section). Anecdotal reports suggest comparable densities for at least parts of the Serpentine Ridge subpopulation, indicating a total population in the tens of thousands, though in the absence of supporting data such a figure remains purely speculative.

It is considered likely that targeted surveys of potential habitat in the three main ultramafic regions will result in 'infilling', while surveys of ultramafics outside these regions may also be fruitful. The latter includes two areas identified but not surveyed by Gibson et al. (1992): Mt Stewart (750 ha) and McIvor Hill (400 ha).

RESERVATION STATUS

Micrantheum serpentinum occurs in Heazlewood Hill Conservation Area, Meredith Range Regional Reserve and Savage River Regional Reserve.

CONSERVATION ASSESSMENT

Micrantheum serpentinum was listed as rare on the original schedules of the Tasmanian *Threatened Species Protection Act 1995*, up-listed to vulnerable in 2002, and down-listed to rare in early 2008 as part of the Act's five-year review. The species was deemed to qualify for rare under criterion B:

- extent of occurrence is less than 2,000 km²;
- area of occupancy is not more than 50 ha;
- most individuals occur in <10 populations.

The species also qualifies for rare under criterion B2:

- 90% of mature individuals occur in 15 or fewer subpopulations or locations and no more than 5 of these occur in an area that is free from sudden processes capable of causing largely irreversible loss of individuals or habitat.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Mineral exploration and/or extraction: *Micrantheum serpentinum* occurs exclusively on ultramafic geology, substrates well known for their mineral-prospectivity (Gibson et al. 1992). Areas supporting the species are in consequence at risk from mineral exploration and extraction. Some known sites have already been affected by such activities, and others remain at risk directly (e.g. exploration roads, tailings dams, open-cut mines) or indirectly (e.g. introduction of weeds and disease, changes in hydrology).

Regional Reserves are available for mineral exploration and extraction, and do not therefore provide full protection from the threats associated with these activities.

Inappropriate fire regimes: The continued absence of fire at known subpopulations is considered a threat to the species' long-term viability (as discussed by Keith (1998) for the co-occurring *Epacris glabella*), while frequent fires may reduce recruitment potential. The latter scenario is considered highly improbable given the region's sporadic fire history, with parts of the Serpentine Hill and Heazlewood River areas not burnt for at least 25 to 35 years.

Land clearing and/or habitat modification: Public, mining or forestry roads either pass through or go close to known subpopulations (as do power easements), with the likely loss of some individuals during their construction and/or maintenance. Such roads are also potential conduits for the introduction and spread of weeds and disease.

***Phytophthora cinnamomi*:** Infestations of this introduced soil-borne plant pathogen are known from areas supporting *Micrantheum serpentinum*, though the species is not thought to be susceptible and, moreover, the pathogen's expression on ultramafics is relatively subdued (Schahinger et al. 2003). However, a number of

flora species in its preferred habitat are known to be susceptible, and in consequence the plant community structure may be altered, with unknown consequences for 'resistant' species such as *Micrantheum serpentinum*.

Weeds: Infestations of *Ulex europaeus* (gorse), *Cytisus scoparius* (english broom) and *Rubus fruticosus* (blackberry) at and close to the Tunnel Hill quarry on the western side of the Murchison Highway pose a minor risk to the Serpentine Hill subpopulation.

MANAGEMENT STRATEGY

The main objectives for the recovery of *Micrantheum serpentinum* are to prevent the inadvertent destruction of subpopulations and maintain their viability, and to promote conditions for successful recruitment.

What has been done?

Survey: Gibson et al. (1992) undertook surveys of six ultramafic areas in northwestern Tasmania, confirming the presence of *Micrantheum serpentinum* in three of them. General surveys of the Heazlewood River and Savage River areas were undertaken in 1995 by North et al. (1998), while surveys of the Heazlewood River area were also undertaken in 2001 as part of the development of the *Strategic Regional Plan for Phytophthora cinnamomi in Tasmania* (Schahinger et al. 2003). Additional surveys have been undertaken in the interim by consultants in the course of mining proposals (eg, Serpentine Hill, Serpentine Ridge). The net result has been a better grasp of the species' distribution, though not necessarily a better understanding of total plant numbers or area of occupancy.

Forest management: That part of the Serpentine Hill subpopulation to the east of the Murchison Highway is on State Forest covered by a flora Special Management Zone (Orr & Gerrard 1998).

Phytophthora management: Parts of the Heazlewood River subpopulation are included in a *Phytophthora cinnamomi* management area (Barker 1994, Schahinger et al. 2003).

Ex situ conservation: Seed has been collected from the Serpentine Hill and Heazlewood River

subpopulations for long-term conservation storage at the Tasmanian Seed Conservation Centre (Royal Tasmanian Botanical Gardens, Hobart).

What is needed?

Recovery actions necessary to decrease the extinction risk to *Micrantheum serpentinum* include:

- conduct surveys of known sites to determine the species' status, including abundance, area of occupancy, population structure and condition, and identify and address any threatening processes;
- ensure that existing and proposed mining activities do not impact significantly on the species, taking cumulative and indirect impacts, as well as the potential impacts of fragmentation into consideration;
- undertake extension surveys of potential habitat in northwestern Tasmania that have escaped scrutiny (eg, Mt Stewart, McIvor Hill);
- monitor the response of the species to fire and physical disturbance to guide future recovery work;
- 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.

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