Image by Eve Lazarus

Alpine candles

Stackhousia pulvinaris

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name: ***Stackhousia pulvinaris*** F.Muell., *Trans. Phil. Soc. Vict.* 1: 101 (1855)
Common name: alpine candles (Wapstra et al. 2005)
Group: vascular plant, dicotyledon, family **Stackhousiaceae**

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic: **Not endemic to Tasmania**
Tasmanian NRM Region: **Cradle Coast**

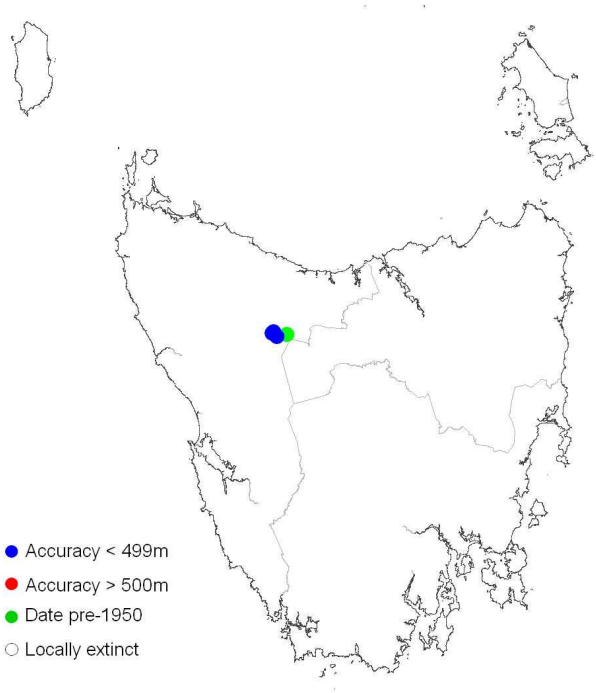

Figure 1. Distribution of *Stackhousia pulvinaris* in Tasmania

Plate 1. *Stackhousia pulvinaris:* herbfield habitat (image by Jennie Whinam)

IDENTIFICATION & ECOLOGY

Stackhousia pulvinaris is a mat-forming herb in the Stackhousiaceae family. In Tasmania the species occurs on the Central Plateau, where it grows within sedgey grasslands or herbfields at the margins of sinkholes (Plate 1). Little is known of the species' ecology; anecdotal evidence suggests pollination by a range of flies and nocturnal moths.

Surveys for *Stackhousia pulvinaris* are best undertaken during its main flowering period, November to January, though it may be identified at other times of year due to its distinctive foliage (Plate 2)

Description

The following description is adapted from Curtis and Morris (1975), Barker (1984), Walsh and Entwisle (1999) and Costin et al. (2000).

Stackhousia pulvinaris is a much-branched perennial which forms dense green mats or cushions to 5 cm high and 20 cm diameter. Its leaves are crowded, linear to oblong with blunt tips, shiny with a slightly fleshy appearance, 5 to 10 mm long and 1 to 2 mm wide. Flowers are star-shaped, 5-merous, 8 to 10 mm in diameter, solitary and stalkless in the uppermost leaf axils. The corolla is creamy yellow, about 5 mm long and sweetly scented. The fruit consists of usually 3 nutlets, each containing a broadly obovoid seed about 2.5 mm long with a smooth to reticulate surface.

Confusing Species

Non-flowering plants may be confused with *Hibbertia procumbens* (spreading guineaflower). The two species are similar in leaf colour and habit, but the leaves of *Stackhousia pulvinaris* tend to be thicker and slightly more upright, with an almost finger-like appearance (Plate 2).

DISTRIBUTION & HABITAT

Stackhousia pulvinaris is endemic to Australia, and is known from the Australian Alps (New South Wales and Victoria) and Tasmania (Barker 1984). Recorded habitat includes alpine herbfield and subalpine grassland, notably in small depressions or at the margins of bogs and swamps (Barker 1984).

Within Tasmania the stronghold for *Stackhousia pulvinaris* is the Vale of Belvoir near Cradle Mountain. The species is locally abundant at the margins of sinkholes where the ground is rocky and exposed (Plate 3), and also extends into grasslands and grassy sedgelands (especially along animal pads and other disturbed areas). The geology of the area consists of basalt over limestone, with friable soils containing a quartz element due to weathering of the Cambro-Ordovician sediments that dominate the adjacent slopes. The altitude range of extant sites is 780 to 870 m above sea level.

Plant species commonly associated with *Stackhousia pulvinaris* in sinkhole situations include *Velleia montana* (mountain velleia), *Rubus gunnianus* (alpine raspberry), *Viola* spp., *Lycopodium fastigiatum* (mountain clubmoss) grasses, mosses and lichens (Plate 1).

In grassland and sedgeland habitat *Poa* spp., *Lepidosperma filiforme* (common rapiersedge), *Empodisma minus* (spreading roperush), *Baloskion australe* (southern cordrush), *Diplarrena latifolia* (western flag-iris) and *Hibbertia procumbens* may all be prominent.

Plate 2. *Stackhousia pulvinaris*: foliage and fruit (image by Tim Rudman)

Table 1. Population summary for *Stackhousia pulvinaris* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of mature plants
1	Vale of Belvoir	Vale of Belvoir Conservation Area & private land *	Cradle Coast	Lea	2010 (1982)	240–250	c. 10,000
2	Cradle Link Road	Vale of Belvoir Conservation Area	Cradle Coast	Pencil Pine	2006 (1982)	< 0.01	c. 40
3	Middlesex Plains	Private land	Cradle Coast	Pencil Pine	1950s? (1915)	Status unknown	

* Partly covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*

Plate 3. *Stackhousia pulvinaris:* sinkhole habitat with flowering mat visible in foreground (image by Eve Lazarus)

Stackhousia pulvinaris was collected from Middlesex Plains in 1915 by Leonard Rodway and in the mid 1900s by Winifred Curtis, but has not been recorded there in contemporary times. In addition, the species was reported during surveys of the Central Plateau in the 1980s from grassy lake-side habitat (Kirkpatrick, pers. comm.). The record was attributed to Lake Antimony, though surveys undertaken in December 2006 failed to locate the species. The record was unvouchered and has not been included in the population summary (Table 1).

The linear range of the extant sites in Tasmania is 5 km, the extent of occurrence 12 km^2, and area of occupancy 240 to 250 hectares.

POPULATION ESTIMATE

Stackhousia pulvinaris is known from two subpopulations in Tasmania, with a total of at least 10,000 plants (Table 1).

The species is easily recognised when in flower and its habitat on the Central Plateau has been relatively well surveyed during its flowering period (e.g., Gilfedder & Kirkpatrick 1994, Corbett 1996). However, surveys undertaken of the Vale of Belvoir site in 2009/2010 indicated that plant numbers were much larger that previously thought, and raise the possibility that additional subpopulations will be uncovered in then wider area given a well-resourced and target survey effort.

RESERVATION STATUS

Reserved within the Vale of Belvoir Conservation Area. That part of the Vale under private ownership is partly covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002.*

CONSERVATION ASSESSMENT

Stackhousia pulvinaris was listed as rare on the original schedules of the Tasmanian *Threatened Species Protection Act 1995.* It was uplisted to vulnerable in March 2009, at that time satisfying criterion D1:

'… total population estimated to number fewer than 1,000 mature individuals.'

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Stackhousia pulvinaris is potentially at risk from inappropriate grazing and fire regimes, land clearance, changes to hydrology and climate change, and, for the smaller of the two extant subpopulations, a stochastic risk of extinction.

Grazing & fire: The species is known to be reasonably common in the northern section of the Vale of Belvoir. The Vale, which includes private and Crown land, has been subject to cattle grazing and localised patch burning since the middle of the nineteenth century — the area is currently subject to a grazing lease issued by the Tasmanian Parks & Wildlife Service.

Stackhousia pulvinaris occurs most abundantly at the Vale of Belvoir in open conditions at the margins of sinkholes, but is also found in grasslands and grassy sedgelands. Its persistence in the latter habitats is likely to be dependent upon periodic reduction of the grass-sedge biomass through fire and/or grazing, though the response of the species to such disturbance is unknown. Basic information relating to the species' life history, recruitment requirements and population dynamics is lacking. It is considered essential that trials are undertaken at the Vale to compile such information so as to better inform the area's future management.

Land clearance: A small proportion of the Vale of Belvoir subpopulation is on private land not covered by covenant, and as such it may be at risk from a range of unregulated activities, including land clearance.

Hydrological changes & climate change: Changes to the Vale's hydrology may impact upon the species indirectly through a diminution of its sink-hole habitat, though this is considered a potential risk only. Drying conditions associated with climate change may accentuate such changes.

Stochastic risk: The subpopulation south of the Cradle Link Road is at risk of extinction through chance events due to its small size.

MANAGEMENT STRATEGY

What has been done?

Surveys for *Stackhousia pulvinaris* were undertaken in December 2006 as part of a project funded by the Tasmanian Wilderness World Heritage Area Program. Areas targeted included the Vale of Belvoir and Lake Antimony on the Central Plateau.

Targeted surveys were undertaken at the Vale of Belvoir in December 2009 and February 2010 by volunteers organised by the Tasmanian Land Conservancy, Threatened Plants Tasmania, Cradle Coast NRM and DPIPWE's Threatened Species Section. The surveys resulted in an order of magnitude increase in the number of known *Stackhousia pulvinaris* plants, from about 1000 to > 10,000, and an increase in the area of occupancy from 0.5 ha to 240–250 ha.

Private land supporting a large proportion of the Vale of Belvoir subpopulation was acquired by the Tasmanian Land Conservancy (TLC) in 2008, and is now covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*. Historic cattle grazing practices at the Vale, on both private and adjoining Crown land, are to continue in at least the medium-term, with an adaptive management plan to be developed by the TLC to maintain the area's biodiversity levels, including species such as *Stackhousia pulvinaris*.

Cuttings of the species have been propagated at the Royal Tasmanian Botanical Gardens, with seed to be collected for long-term 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 DPIPWE, the Royal Tasmanian Botanical Gardens and the Tasmanian Herbarium).

Management Objectives

The main objectives for the recovery of *Stackhousia pulvinaris* are to prevent the inadvertent destruction of subpopulations and maintain the viability of existing subpopulations through appropriate habitat management and an improved understanding of the species' recruitment requirements.

What is needed?

- develop and implement a management plan for the Vale of Belvoir to ensure that the species' habitat is maintained;
- undertake extension surveys of suitable habitat at Middlesex Plains and to the south of the Cradle Link Road, and identify management issues as required;
- determine the species' germination requirements and response to fire and grazing;
- monitor the known subpopulations at two-yearly intervals to determine the level of recruitment and/or plant loss and to better inform management prescriptions;
- 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 known subpopulations and areas of potential habitat.

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View:
www.dpipwe.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species Section, Department of Primary Industries, Parks, Water & Environment, 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.