

Veronica ciliolata subsp. *fiordensis*

Ben Lomond cushionplant



TASMANIAN THREATENED FLORA LISTING STATEMENT

Left: © Richard Schahinger
Right: © Sally Anthony

Scientific name: *Veronica ciliolata* subsp. **fiordensis** (Ashwin) Meudt, *Austral. Syst. Bot.* 21: 413 (2008)

Common Name: Ben Lomond cushionplant (Wapstra *et al.* 2005)

Previous names: *Chionohebe ciliolata*, *Pygmea ciliolata*

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

Status: *Threatened Species Protection Act 1995:* **endangered**
Environment Protection and Biodiversity Conservation Act 1999: **Vulnerable**
IUCN Red List: **Not listed**

Distribution: Endemic status: **Within Australia, occurs only in Tasmania**
Tasmanian NRM Region: **North**
Tasmanian IBRA region (V7): **Ben Lomond**

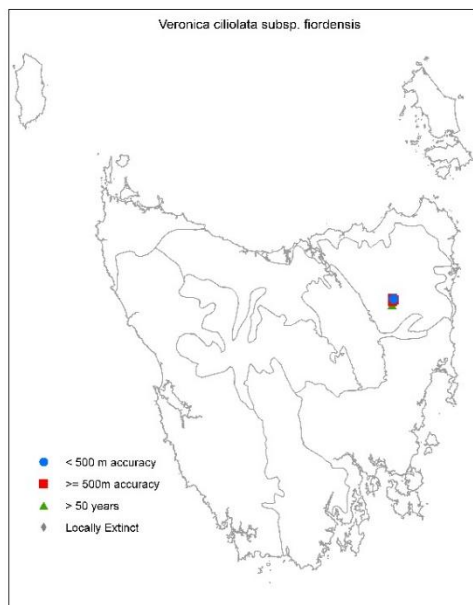


Figure 1. Distribution of *Veronica ciliolata* subsp. *fiordensis* within Tasmania, showing IBRA regions (from Natural Values Atlas)



Plate 1. *Veronica ciliolata* subsp. *fiordensis* showing cushion habit (© Richard Schahinger)

SUMMARY: *Veronica ciliolata* subsp. *fiordensis* is a cushion-forming plant in the Plantaginaceae family. It is an alpine species, known from a single location on the summit of Hamilton Crags in Ben Lomond National Park. The species occurs exclusively on Jurassic dolerite, at altitudes between 1,470 and 1,530 m above sea level. The species is naturally rare, with total population size estimated to be less than 5,000 mature individuals. The species has undergone substantial decline in recent years, presumably due to climate change. Continued monitoring of the population is required to inform future management, and *ex situ* conservation and translocation may be required to establish insurance populations.

IDENTIFICATION AND ECOLOGY

Veronica ciliolata subsp. *fiordensis* is a cushion-forming plant in the Plantaginaceae family. Flowering occurs from December to February. Wagstaff and Garnock-Jones (2000) note that related species are obligate out-crossers (cannot self-fertilise), and pollination is via insects, although the specific pollinators of *V. ciliolata* subsp. *fiordensis* are unknown. Seeds are dispersed by ballistic projection, wind and water (Thorsen et al. 2009), with most seed likely to fall within a few metres of the parent plant.

Veronica ciliolata subsp. *fiordensis* is thought to be long-lived, with a possible lifespan of hundreds of years, similar to other alpine cushion plants (Morris and Doak 1998).

Description

Veronica ciliolata subsp. *fiordensis* forms dense, compact cushions up to 50 cm in diameter, with small white flowers set amongst its light green foliage. The cushions are usually tightly compacted and rather rigid, 2 to 4 cm high. Its leaves are stiffly imbricate, 2.5 to 4 mm long by 1.5 to 2 mm wide, narrow-ovate to ovate-spathulate, subacute to acute, ciliate (hairy) more or less to their base, though often few and appressed near the tip except for a prominent apical tuft. The calyx is 3 to 4 mm long and divided two-thirds the way or more into 5 to 6 linear lobes, the lobes being hairy for most of their length on their outer surface as well as the margins. The corolla is white, 6 to 7 mm long,

the tube longer than the calyx, with 5 obtuse lobes. Capsules are about 2 by 2 mm, glabrous or hairy at apex.

[Description adapted from Allan (1982) and Davies and Davies (1989).]

Survey techniques

The peak flowering period is summer, however the species can be readily identified year-round due to its distinctive foliage. The species is vulnerable to trampling and care must be taken to minimise impact during surveys.

Confusing Species

The species' floral and leaf features readily distinguish it from the two other cushion plants that occur on the Ben Lomond plateau, *Abrotanella forsteroides* and *Pterygopappus lawrencei* from the Asteraceae family (Curtis 1963, Davies and Davies 1989, Kirkpatrick 1997). The leaves of *Abrotanella forsteroides* are narrow and dark green, and the tip of the leaves extend into a single hair, while the leaves of *Pterygopappus lawrencei* are shaggy-haired. They also occupy different niches, with *Veronica ciliolata* subsp. *fiordensis* occurring on well-drained rocky outcrops with skeletal soils, whereas the other two species grow in poorly drained areas with peaty soils.



Plate 2. *Veronica ciliolata* subsp. *fiordensis*: foliage
(© Richard Schahinger)

DISTRIBUTION AND HABITAT

Within Australia, the only known occurrence of *Veronica ciliolata* subsp. *fiordensis* is within Ben Lomond National Park, Tasmania, on the summit of Hamilton Crags (Figure 1). It also occurs in New Zealand where its conservation status is “At-risk, naturally uncommon” (de Lange et al. 2017).

Veronica ciliolata subsp. *fiordensis* grows in alpine fjeldmark vegetation at altitudes of 1,470–1,530 m above sea level. It occurs on skeletal soils derived from Jurassic dolerite, or in rock crevices and between boulders where no obvious soil exists (Davies and Davies 1989; Kirkpatrick 1997) (Plate 3).

Associated snow patch vegetation includes the grasses *Poa costiniana* and *Deyeuxia monticola*, and the herbs *Ewartia catipes* (Davies and Davies 1989). Plants observed growing within *Veronica ciliolata* subsp. *fiordensis* cushions include *Gentianella* sp., *Gaultheria depressa*, *Oreomyrrhis* sp., the fern ally *Lycopodium fastigiatum*, and grasses.



Plate 3. *Veronica ciliolata* subsp. *fiordensis*: habitat at Hamilton Crags (© Joe Quarmby)

POPULATION PARAMETERS

As per the IUCN definitions:

Number of subpopulations: 1

Number of locations: 1

Extent of Occurrence: 4 km²

Area of Occupancy: 4 km²

Number of mature individuals: <5,000

Note: Extent of occurrence (EOO) when measured using a minimum convex polygon is only 0.18 km² which is less than the Area of occupancy (AOO). Therefore, the EOO is equal to the AOO as per the IUCN guidelines.

Population size is difficult to calculate for this species due to its cushion-forming habit and tendency to clump and overlap. Surveys in 2016 recorded 2,422 individuals, however this did not cover the entire area occupied by the species, so an extrapolation was made which resulted in population size estimate of 5,000 individuals (Schahinger 2016). However, transect data in 2024 suggests that the population has experienced a significant decline (39–44%) in area and cover between 2016 and 2024. Therefore, the number of mature individuals is now estimated to be <5,000 (Quarmby 2024).

Given the level of past survey efforts across the state’s alpine regions (Davies and Davies 1989, Davies and Davies 1990, Kirkpatrick 1980, 1984, Kirkpatrick and Brown 1987, Kirkpatrick and Whinham 1988)) the likelihood of *Veronica ciliolata* subsp. *fiordensis* populations being discovered outside its currently known extent of occurrence is low

Table 1. Population summary for *Veronica ciliolata* subsp. *fiordensis*

Subpopulation	Tenure	NRM Region *	1:25000 mapsheet	Year last (first) seen	Area of subpopulation (ha)	Number of mature plants
Hamilton Crags	Ben Lomond National Park	North	Giblin	2024 (1973)	3 to 4**	<5,000

RESERVATION STATUS

The entire known *Veronica ciliolata* subsp. *fiordensis* population in Tasmania occurs within Ben Lomond National Park.

CONSERVATION ASSESSMENT

Veronica ciliolata subsp. *fiordensis* is currently listed as endangered on the *Threatened Species Protection Act 1995* (TSP Act).

It is also listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The conservation status of the species was reviewed by NRE Tas in 2024. This found that the sub-species meets the IUCN criteria for Critically Endangered A3b + B1ab(i,ii,iii,iv) + B2ab(i,ii,iii,iv), therefore was uplisted to endangered under the TSP Act as the highest level of threat under Tasmanian legislation.

The change in status was triggered by the substantial dieback observed between 2016 and 2024, and the projected continuing decline of the species due to climate change.

THREATS AND LIMITING FACTORS

Threats to the species include climate change, recreational activities, pathogens and disease, and wildfire.

Climate change: The recent dieback in *Veronica ciliolata* subsp. *fiordensis* is suspected to be associated with climate change. Specifically, increased temperatures, reduced snow cover, and reduced rainfall are thought to be causing heat stress, dehydration, necrosis, and seedling mortality, as has been reported in similar alpine cushion plants (Ladinig et al. 2015, Verral et al. 2023, La Roux et al. 2005, Marchand et al. 2020).

V. ciliolata subsp. *fiordensis* grows in a highly specialised niche (snow patch fjeldmark vegetation above 1,500 m), making it highly susceptible to climatic change, similar to other alpine endemics (Pauli et al. 2003, Fischlin et al. 2007). Trends in climate data in north-east Tasmania indicate that annual mean and minimum temperatures have been increasing since 1970 (Jones et al. 2007, Grose et al. 2010). Recent climate modelling for Ben Lomond by Risk Frontiers (GHD 2023) forecast that the number of days below -3 °C will reduce by

approximately 54% by 2050. There is also potential that *V. ciliolata* subsp. *fiordensis* could be out-competed by encroaching vegetation migrating upslope as a result of climate change (Watts et al. 2022, Morgan and Walker 2023), although there is no evidence of this occurring yet.

Recreational activities: Ben Lomond National Park is the focus of downhill skiing in Tasmania (Parks and Wildlife Service 1998). *Veronica ciliolata* subsp. *fiordensis* occurs just 200 m to the east of the designated ski field development zone (PWS 1998). Expansion of the ski-field could cause direct damage to the species from slope grooming (direct removal of cushion plants and scalping of soil) and by skis (scraping and crushing of foliage) (Wardle and Fahey 2002). Snow compaction could have indirect impacts such as changes to growing season, soil moisture, increased frost penetration and duration and changes to soil microbial activity (Meyer 1993, Emers et al. 1995).

Trampling by hikers, especially in the summer months, is also a potential risk to the species. Cushion plants are very susceptible to trampling and often die when crushed. Foot traffic can also cause soil erosion in alpine environments and introduce pathogens. There is a trig point on the summit of Hamilton Crag which could attract hikers, however there is no footpad or obvious evidence of impacts from foot traffic currently. There is also a risk that a formalised walking track could be proposed in this area due to its proximity to the ski village.

The development of mountain bike trails at Hamilton Crag has also been proposed in the past, which if realised has the potential to impact on the species via direct removal/damage of plants, introduction of pathogens, habitat loss and fragmentation.

Pathogens and disease: Soil-borne pathogens could potentially cause dieback in *V. ciliolata* subsp. *fiordensis*. While there is no evidence that a pathogen is causing the current dieback in the species, there is a possibility that a pathogen is involved, as is suspected with Macquarie Island cushion plant (Dickson et al. 2021, Visoiu 2019). The risk of pathogens could be exacerbated by increased recreational activity and climate change.

Wildfire: A severe wildfire event has the potential to cause an irreversible impact on *Veronica ciliolata* subsp. *fiordensis*. It is suspected that the species is fire-sensitive, like other alpine cushion plants. Fire is likely to kill mature individuals and it would have to recolonise via seed from an adjacent unburnt area in order to persist. Given the species' extremely restricted distribution, there is risk that it could be eliminated by wildfire. Although there is no documented history of fires on Ben Lomond plateau, the incidence of bushfires caused by dry lightning in Tasmania's alpine areas is increasing (Kirkpatrick et al. 2018) and cannot be discounted. While the likelihood of wildfire on the Ben Lomond plateau may be low, the consequence of an extreme wildfire event could be catastrophic for this species.

MANAGEMENT STRATEGY

The main objective for recovery of *Veronica ciliolata* subsp. *fiordensis* is to ensure that there is no decline in the only known population.

What has been done?

- Areas known to support *Veronica ciliolata* subsp. *fiordensis* were included in the 'natural zone' where development and facilities are limited as part of the statutory Management Plan for Ben Lomond NP. (Parks and Wildlife Service 1998).
- Surveys targeting *Veronica ciliolata* subsp. *fiordensis* were conducted in December 2005, January 2016, and February 2024 with the latter two surveys following standardised permanent transects.
- Seed has been collected for long-term conservation storage at the Tasmanian Seed Conservation Centre, part of the Royal Tasmanian Botanical Gardens, Hobart (Wood 2014).

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. The actions required, in order of priority, are:

1. Climate change adaptation measures should be considered, including; assisted migration and habitat management (e.g. managing shrub invasion). *Ex situ* conservation measures and translocation are highly likely to be necessary to ensure the long-term survival of this species. An assessment of the efficacy of translocation success for this species is warranted. Surveys of probable translocation sites, within the predicted climate envelope of the species should be undertaken as soon as feasible.
2. Measures to prevent potential impacts from development and recreational activities (including skiing walking and mountain biking) on *V. ciliolata* subsp. *fiordensis* should be considered in future reviews of the Management Plan for Ben Lomond NP.
3. Additional seed collection and *ex situ* propagation should be undertaken.
4. Formal research and monitoring to determine population trends, the species' life history attributes, and the impact of climate change should be conducted.
5. Extension surveys during the taxon's peak flowering period, from December to February, targeting well-drained rocky areas in Tasmania's northeastern alpine zone should be undertaken.

REFERENCES

- Allan, H.H. (1982). *Flora of New Zealand. Volume 1*. Government Printer, Wellington, New Zealand.
- Balmer, J., Kirkpatrick, J.B., Brown, M.J., Styger, J., Whinam, J. (2021). Establishment Report for the Tasmanian Wilderness World Heritage Area Climate Change Monitoring Program: Moorland – alpine transition in southwest Tasmania. Nature Conservation Report 2021/03. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania.
- Curtis, W.M. (1963). *The Student's Flora of Tasmania. Part 2*. Government Printer, Hobart, Tasmania.
- Davies, J.B. & Davies, M.J. (1989). *Plant Communities of the Ben Lomond Plateau. Occasional paper number 1*, Queen Victoria Museum and Art Gallery, Launceston, Tasmania.

- Davies, J.B. & Davies, M.J. (1990). *Plant communities of Mt Barrow and Mt Barrow Falls*. Occasional paper number 2, Queen Victoria Museum and Art Gallery, Launceston, Tasmania.
- de Lange, P.J., Rolfe, J.R., Barkla, J.W., Courtney, S.P., Champion, P.D., Perrie, L.R., Beadel, S.M., Ford, K.A., Breitwieser, I., Schonberger, I., Hindmarsh-Walls, R., Heenan, P.B. & Ladley, K. (2018). *Conservation status of New Zealand indigenous vascular plants, 2017*. New Zealand Threat Classification Series 22. Department of Conservation, Wellington, New Zealand.
- Dickson, C.R., Baker, D.J., Bergstrom, D.M., Brookes, R.H., Whinam, J. & McGeoch, M.A. (2021). Widespread dieback in a foundation species on a sub-Antarctic World Heritage Island: Fine-scale patterns and likely drivers. *Austral Ecology*, 46: 52–64.
- Emers, M., Jorgenson, J.C. and Reynolds, M.K. (1995). Response of arctic tundra plant communities to winter vehicle disturbance. *Canadian Journal of Botany*, 73: 905–917.
- Fischlin, A., Midgley, G.F., Price, J.T., Leemans, R., Gopal, B., Turley, C., Rounsevell, M.D.A., Dube, P., Tarazona, J., Velichko, A.A. (2007). Ecosystems, their properties, goods, and services in M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (Eds), *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, 211–272
- GHD (2023). *Ben Lomond Snowmaking Feasibility and Economic Cost Benefit Assessment*. A report for Department of Natural Resources and Environment Tasmania. <https://parks.tas.gov.au/Documents/Ben%20Lomond%20Snowmaking%20Feasibility%20Study.pdf>
- Grose, M.R., Barnes-Keoghan, I., Corney, S.P., White, C.J., Holz, G.K., Bennett, J.B., Gaynor, S.M. & Bindoff, N.L. (2010). *Climate Futures for Tasmania: general climate impacts technical report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania.
- Jones, D., Wang, W. & Fawcett, R. (2007). *Climate Data for the Australian Water Availability Project, Final Milestone Report*, October 2007, Bureau of Meteorology, Canberra, ACT.
- Kirkpatrick, J.B. (1980). Tasmanian high mountain vegetation 1 - A reconnaissance survey of the Eastern Arthur Range and Mount Picton. *Papers and Proceedings of the Royal Society of Tasmania*, 114: 1–20.
- Kirkpatrick, J.B. (1984). Tasmanian high mountain vegetation 2 - Rocky Hill and Pyramid Mountain. *Papers and Proceedings of the Royal Society of Tasmania*, 118: 5–20.
- Kirkpatrick, J.B. (1997). *Alpine Tasmania: An Illustrated Guide to the Flora and Vegetation*. Oxford University Press, Melbourne, Victoria.
- Kirkpatrick, J.B. & Brown, M.J. (1987). The nature of the transition from sedgeland to alpine vegetation in Southwest Tasmania. Altitudinal vegetation change in four mountains. *Journal of Biogeography*, 14: 539–550.
- Kirkpatrick J.B & Whinham J. P. (1988). Tasmanian high mountain vegetation. 3 Lake Ewart, Dome Hill and Eldon Bluff. *Papers and Proceedings of the Royal Society of Tasmania*, 122: 145–164.
- Kirkpatrick, J.B., Styger, J. & Marsden-Smedley, J. (2018). Impact of changes in lightning fire incidence on the values of the Tasmanian wilderness world heritage area. *Papers and Proceedings of the Royal Society of Tasmania*, 152: 27–32.
- Ladinig, U., Pramsohler, M., Bauer, I., Zimmermann, S., Neuner, G. & Wagner, J. (2015). Is sexual reproduction of high-mountain plants endangered by heat? *Oecologia*, 177: 1195–1210.
- Le Roux, P.C., McGeoch, M.A., Nyakatya, M.J., Chown, S.L. (2005). Effects of a short-term climate change experiment on a sub-Antarctic keystone plant species. *Global Change Biology*, 11: 1628–1639.

- Marchand, L.J., Tarayre, M., Dorey, T., Rantier, Y. & Hennion, F. (2020). Morphological variability of cushion plant *Lyallia kerguelensis* (Caryophyllales) in relation to environmental conditions and geography in the Kerguelen Islands: implications for cushion necrosis and climate change. *Polar Biology*, 44: 17–30.
- Meudt, H.M. (2008). Taxonomic revision of Australian snow hebes (*Veronica*, Plantaginaceae). *Australian Systematic Botany*, 21: 387–421.
- Meyer, E. (1993). The impact of summer and winter tourism on the fauna of alpine soils in western Austria (Oetztal Alps, Ratikon). *Revue Suisse de Zoologie*, 100: 519–527.
- Morgan, J. & Walker, Z. (2023) Early-melting snowpatch plant communities are transitioning into novel states. *Scientific Report*, 13:16520.
- Morris, W. & Doak, D. (1998). Life history of the long-lived gynodioecious cushion plant *Silene acaulis* (Caryophyllaceae), inferred from size-based population projection matrices. *American Journal of Botany*, 85: 784–793.
- Parks and Wildlife Service (PWS) (1998). *Ben Lomond National Park Management Plan*. Department of Primary Industries, Water and Environment, Hobart. <https://parks.tas.gov.au/about-us/managing-our-parks-and-reserves/management-plans-and-reports>
- Pauli, H., Gottfried, M., Grabherr, G. (2003). Effects of climate change on the alpine and nival vegetation of the Alps. *Journal of Mountain Ecology*, 7: 9–13.
- Quarby, J. (2024). Report on the monitoring of *Veronica ciliolata* subsp. *fiordensis* at Hamilton Crags, February 2024. Department of Natural Resources and Environment, Hobart, Tasmania.
- Schahinger, R. (2016). *Veronica ciliolata* subsp. *fiordensis* (*ben lomond cushionplant*): *Monitoring report, January 2016*. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania.
- Thorsen, M. J., Dickinson, K. J. M. & Seddon, P. J. (2009). Seed dispersal systems in the New Zealand flora. Perspectives in *Plant Ecology, Evolution and Systematics*, 11: 285–309.
- Verrall, B., Green, K. & Pickering, C.M. (2023). Temporal dynamics in alpine snowpatch plants along a snowmelt gradient explained by functional traits and strategies. *Oecologia*, 201: 155–171.
- Wagstaff, S.J. & Garnock-Jones, P.J. (2000). Patterns of diversification in *Chionohebe* and *Parabebe* (Scrophulariaceae) inferred from ITS sequences. *New Zealand Journal of Botany*, 38: 389–407.
- Wapstra, H., Wapstra, A., Wapstra, M. and Gilfedder, L. (2005). *The Little Book of Common Names for Tasmanian Plants*. Department of Primary Industries, Water and Environment, Hobart, Tasmania.
- Wardle, K. & Fahey, B. (2002). *Monitoring vegetation changes at Treble Cone Ski Field, New Zealand*. Department of Conservation, Wellington, New Zealand.
- Watts, S.H., Mardon, D.K., Mercer, C., Watson, D., Cole H., Shaw, R.F. & Jump, A.S. (2022). Riding the elevator to extinction: Disjunct arctic-alpine plants of open habitats decline as their more competitive neighbours expand. *Biological Conservation*, 272: 109620.
- Wood, J.A. (2014). RTBG Germination Database (December, 2014). <http://www.rtbg.tas.gov.au/tasgerm>
- Visoiu, M. (2019). *Flora Values Assessment and Monitoring Report – Macquarie Island Nature Reserve and World Heritage Area – March 2019*. Nature Conservation Report 19/01, Natural and Cultural Heritage Division, DPIIWE. Hobart, Tasmania.
- Prepared** in 2008 under the provisions of the Tasmanian *Threatened Species Protection Act 1995* and updated in October 2011. Revised in September 2025.
- Cite as:** Threatened Species Section (2025). Listing Statement for *Veronica ciliolata* subsp. *fiordensis* (*ben lomond cushionplant*), Department of Environment and Natural Resources, Tasmania.
- View:** www.nre.tas.gov.au/threatenedspecieslists www.threatenedspecieslink.tas.gov.au/
- Contact details:** Threatened Species Section, Department of Natural Resources and Environment Tasmania, GPO Box 44 Hobart

Tasmania Australia 7001. Ph. (03) 61654340.
threatenedspecies.enquiries@nre.tas.gov.au

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

Version history

Version	Date	Author	Purpose/Change
1.0	2008	Threatened Species Section	First version. Endorsed by the Scientific Advisory Committee meeting 45.
1.1	October 2011	Threatened Species Section	Minor revisions to reflect taxonomic revisions – updated genus
1.2	June 2016	Threatened Species Section	Revised to reflect 2016 survey information
2.0	February 2026	Threatened Species Section	Revised in 2024 by Joe Quarmby (TSS), Alexia Graba-Landry (TSS) and Carla Bruinsma (TSS) to reflect 2024 survey information to support the uplisting from vulnerable to endangered on the TSP Act and minor revisions to reflect taxonomic revisions to family name from Scrophulariaceae to Plantaginaceae. Endorsed by the Scientific Advisory Committee at meeting 43.