

maidenhair spleenwort

Asplenium hookerianum

TASMANIAN THREATENED FLORA LISTING STATEMENT



Image by Michael Garrett

Scientific name: *Asplenium hookerianum* Colenso, *Tasm. J. Nat. Sci.* 2: 169 (1844)

Common Name: maidenhair spleenwort (Wapstra *et al.* 2005)

Group: vascular plant, pteridophyte, family **Aspleniaceae**

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

Distribution: Endemic: **Not endemic to Tasmania**
Tasmanian NRM Region: **Cradle Coast, North & South**

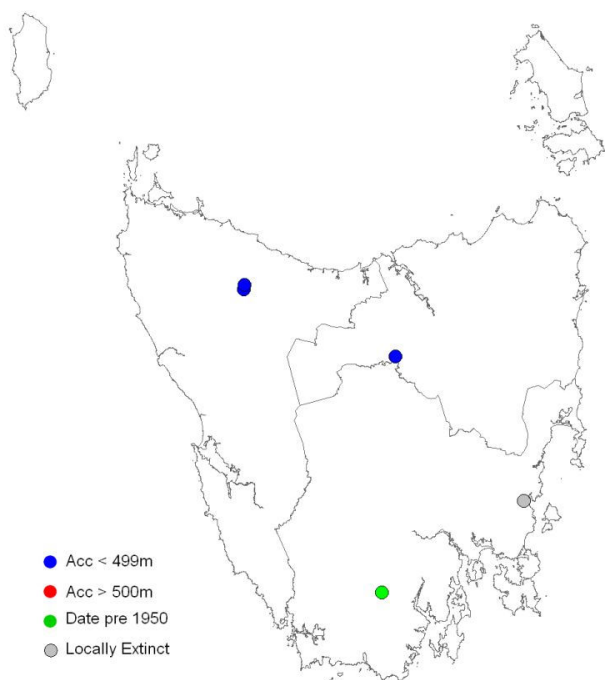


Figure 1. Distribution of *Asplenium hookerianum* in Tasmania



Plate 1. *Asplenium hookerianum* habit
(Image by Michael Garrett)

IDENTIFICATION & ECOLOGY

Asplenium hookerianum is a small tufted fern in the Aspleniaceae family. It has been recorded from a few sites in northern, eastern and southern Tasmania. The species grows in heavily shaded fissures on watercourse margins within rainforest or in very sheltered gullies within drier forest types. Recruitment is primarily from spores.

Description

Asplenium hookerianum arises from a short rhizome covered with lattice-like scales. Fronds are 5 to 15 cm long with scattered scales extending up the stipe and on to the rachises and veins. The lamina is mid to dark green, oblong-triangular, pinnate to bipinnate, and membranous. The pinnae have slender stalks, while pinnules are obovate to triangular, bluntly toothed or deeply lobed. Sori are present on the lower pinnule surface along the veins, distant from the pinnule margins; sori are short and oblong, each protected by a membranous indusium (Duncan & Isaac 1986).

Confusing Species

The allied species *Asplenium bulbiferum* is generally larger and has less delicate fronds than *Asplenium hookerianum* (Walsh & Entwisle 1994). The secondary pinnae of *Asplenium hookerianum* are clearly and slenderly stalked, while those of *Asplenium bulbiferum* are sessile or shortly stalked. The latter species may also develop bulbils (plantlets) on its fronds, a feature not displayed by *Asplenium hookerianum* (Duncan & Isaac 1986, Garrett 1996, Brownsey 1998). Hybrids between *Asplenium hookerianum* and *Asplenium bulbiferum* have been observed in Tasmania, with frond and scale characters intermediate between the two parents (Garrett 1986).

DISTRIBUTION AND HABITAT

Asplenium hookerianum occurs in Tasmania, Victoria and New South Wales. The species is very rare in Victoria, being known only from the watershed of the Wonnongatta River in the Alpine National Park, while in New South Wales there are historic records from the Upper Hume River (Wakefield 1975, Walsh & Entwisle 1994, Brownsey 1998). *Asplenium*

hookerianum also occurs in New Zealand, where it is reportedly one of the most common and widespread species of *Asplenium* (Brownsey & Smith-Dodsworth 1989).

Asplenium hookerianum has a disjunct distribution across Tasmania, being known from Hellyer Gorge in the northwest, Drys Bluff in the central north and, until recently, from Rudds Hill near Orford in the southeast (see below). The species was collected from the Picton River in Tasmania's south in 1874 (MEL 114960), though its status at this site is unknown. The linear range of the two extant sites in Tasmania is 111 km, with an area of occupancy c. 2 ha.

The occurrence of *Asplenium hookerianum* in the 'valleys of the Franklin River in the south-west' had been noted by Duncan and Isaac (1986). The collection on which this note was based has since been determined to be *Polystichum proliferum* (Garrett 2005, pers. comm.).

Hellyer Gorge site: *Asplenium hookerianum* grows on the margins of the Hellyer River under tall rainforest dominated by *Nothofagus cunninghamii*. About 100–200 plants were recorded over an 800 m stretch of river in 1996 (Garrett 1997), though numbers had declined to less than 10 in 2009 (Larcombe & Garrett 2009). The altitude range is 250–260 m asl, while the underlying parent material is Permo-Carboniferous tillite, with extensive areas of Tertiary basalt upstream. Plants typically grow in moist, well-drained loamy soils on vertical or near-vertical banks, often on the lips of ground fissures or sinuses at or near high-water level. The species has also been observed growing on rock and on the lower trunks of the ferns *Dicksonia antarctica* and *Blechnum nudum*. Co-occurring ferns include *Asplenium appendiculatum*, *Asplenium bulbiferum*, *Asplenium flabellifolium*, *Hymenophyllum rarum* and *Hymenophyllum cupressiforme*, as well as *Asplenium hookerianum* × *bulbiferum* (Fatt 1984; Garrett 1986).

Drys Bluff site: *Asplenium hookerianum* is known from several unnamed creeks below the Bluff. Plants grow occur on near-vertical soil banks, rock outcrops and (rarely) tree bases. The vegetation of the adjacent slopes is

Eucalyptus delegatensis wet forest, the elevation range 450–700 m asl, and the parent material Jurassic dolerite.

Orford site: A few mature *Asplenium hookerianum* plants were recorded in the early 1990s from a near-coastal gully dominated by the small broad-leaved trees *Olearia argophylla* and *Zieria arborescens*. The surrounding vegetation consisted of dry eucalypt forest dominated by the Tasmanian endemic peppermint *Eucalyptus pulchella*, with *Eucalyptus globulus* also present. Co-occurring ferns included *Doodia australis* and *Asplenium flabellifolium*. The elevation range at the Orford site is 80–90 m asl, the parent material Jurassic dolerite, with an annual rainfall less than 700 mm (about half that at the Hellyer and Drys Bluff sites).

RESERVATION STATUS

Asplenium hookerianum is reserved in Hellyer Gorge State Reserve and Drys Bluff Forest Reserve.

POPULATION ESTIMATE

There are two extant subpopulations in Tasmania, one presumed extinct site and one of uncertain status (Table 1). The Hellyer Gorge and Drys Bluff subpopulations are known to

support at least 200 plants, with good recruitment at the latter site, though it should be noted that the full extent of the species at the two sites has yet to be determined (Larcombe & Garrett 2009). The Rudds Hill site near Orford consisted of two or three mature plants and several sporelings in 1996, but these have not been relocated in recent years (Garrett pers. comm.). The species' status along the Picton River is unknown.

CONSERVATION ASSESSMENT

Asplenium hookerianum was listed as vulnerable on the Tasmanian *Threatened Species Protection Act 1995* in 1995, and up-listed to endangered in early 2008 as part of the Act's 5-year review. The species qualifies for endangered under criterion B:

- area of occupancy is less than 0.1 km² (10 hectares);
- known to exist at no more than five locations;
- a continuing decline observed in the number of locations.

Asplenium hookerianum is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Table 1. Population summary for *Asplenium hookerianum* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature (& juvenile) plants
1	Hellyer Gorge	Hellyer Gorge State Reserve	Cradle Coast	Parrawe	2009 ^ 1996 * (1979)	0.0001 1–1.5 *	6 (3) 100–200
2	Drys Bluff	Drys Bluff Forest Reserve	North	Liffey	2009 ^ 1996 * (1992)	c. 1 < 0.5	180 (136) c. 390
3	Rudds Hill (Orford)	Private (with covenant)	South	Orford	1996 * (1993)	–	Presumed extinct *
4	Picton River	State Forest or Forest Reserve	South	Picton	1874	–	Status uncertain

NRM region = Natural Resource Management region; * = Garrett (1997) and unpublished data; ^ = Larcombe & Garrett (2009).

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Land clearance & hydrological changes:

Substantial areas of the Hellyer River catchment upstream of the known *Asplenium hookerianum* site are devoted to plantation forestry and agriculture on State Forest and private land. These activities have the potential for adverse downstream impacts if sufficient streamside buffers are not maintained. Possible impacts include an increase in flooding, higher nutrient and sediment loadings, and herbicide contamination.

Weed invasion: The Hellyer Gorge population was considered to be at some risk from blackberry (*Rubus fruticosus*) invasion in the mid 1990s (Garrett 1997), though a comparison of the extent of blackberry in 1997 and 2009 suggests that this risk is very slight (Larcombe & Garrett 2009).

Climate change & stochastic events: Drying conditions associated with climate change may lead to a diminution of available habitat for the species, while the small size of the extant subpopulations means that the risk of extinction from stochastic events is high.

MANAGEMENT STRATEGY

What has been done?

Asplenium hookerianum is listed as a priority species requiring consideration in the development of the private land component of the Tasmanian reserve system (DPIWE 1998). The Private Forest Reserves Program negotiated a conservation covenant under the Tasmanian *Nature Conservation Act 2002* with the owners of the Rudds Hill population, though as noted above, the subpopulation is now thought to be extinct.

Blackberry infestations at the Hellyer Gorge site were partially controlled in the early 1990s through a project involving the Tasmanian Parks and Wildlife Service, the (then) Department of Roads and Transport, and the Rainforest Conservation Program (Garrett 1997).

Surveys were conducted and management prescriptions prepared for *Asplenium hookerianum* in preparatory studies for the Regional Forest Agreement (Garrett 1997), and

targeted surveys for the species were undertaken in 2009 under the auspices of an NRM-funded threatened flora project (Larcombe & Garrett 2009). The latter resulted in the discovery of the species along four additional creeks in the Drys Bluff area, with clear signs of active recruitment (Table 1).

Asplenium hookerianum was included in a multi-species recovery plan (Barker & Johnson 1998), though the plan was not formally adopted nor implemented. A draft national Recovery Plan for *Asplenium hookerianum* has been prepared (Sutter 2009).

Management objectives

The main objectives for the recovery of *Asplenium hookerianum* are to minimise the probability of extinction of the wild population by ensuring habitat protection, and to secure all key subpopulations under effective management regimes within the next five years. These objectives are consistent with the *Draft Recovery Plan for Tasmanian Threatened Ferns* (Threatened Species Section 2010).

What is needed?

- provide information and extension support to the 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;
- ensure adequate streamside buffers are maintained upstream of Hellyer Gorge;
- conduct surveys of potential habitat at Drys Bluff, Hellyer Gorge and the Picton River;
- monitor the known subpopulations every 3 to 5 years to determine trends and any new threats.

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