Cheilanthes distans

bristly rockfern

TASMANIAN THREATENED FLORA LISTING STATEMENT

Image by Richard Schahinger

Scientific name: ***Cheilanthes distans*** (R.Br.) Mett., *Abh. Senckenberg. Naturf. Ges.* 3: 69 (1859)

Common name: bristly rockfern (Wapstra et al. 2005)

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

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

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

Distribution: Endemic: **Not endemic to Tasmania**

Tasmanian NRM Region: **North**

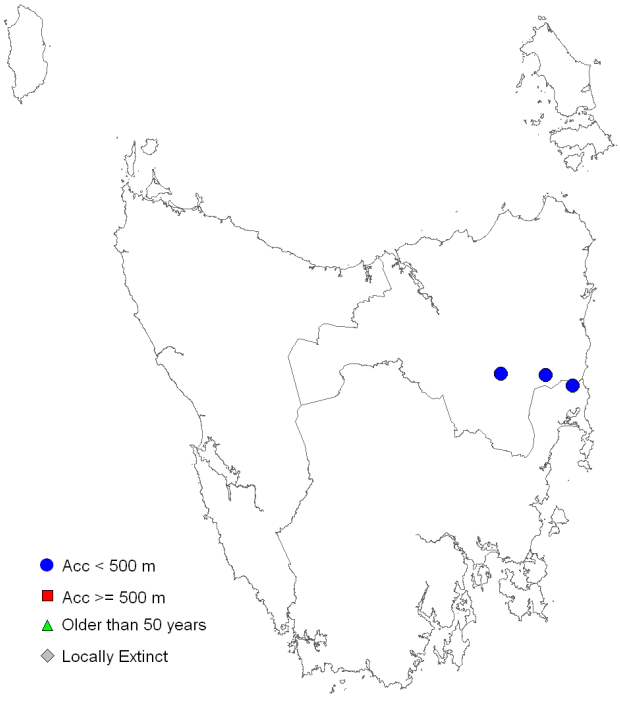

Figure 1. Distribution of *Cheilanthes distans* in Tasmania

Plate 1. *Cheilanthes distans*: habit (image by Tim Rudman)

IDENTICATION & ECOLOGY

Cheilanthes distans is a terrestrial fern in the Adiantaceae family (Duncan & Isaac 1986). It is known in Tasmania from three sites in the Eastern Tiers and Fingal Valley, where it grows on well-insolated rock plates.

Cheilanthes distans is one of the so-called 'resurrection' ferns, resurrection referring to its ability to recover from a desiccated state following rain. It is also capable of apogamic (i.e., asexual) reproduction (Quirk & Chambers 1981); this obviates the need for free water to facilitate fertilisation, as is required for sexual reproduction, allowing the species to reproduce in xerophytic conditions. However, spread at sites in Tasmania appears to be primarily from rhizomes, with plants capable of resprouting after physical damage.

Survey techniques

The species is more or less deciduous over summer, but may recover in response to significant rain events. Any planned searches should thus be mindful of rainfall patterns during the previous months and adjusted accordingly. The species' distinctive frond vestiture means that it can be identified even in a relatively desiccated state.

Description

Cheilanthes distans has a short, coarse, scaly rhizome that is semi-erect or horizontal. Scales are narrow and tapering and are dark and shiny with paler borders. Fronds are clustered towards the tip of the rhizome. They are stiffly erect and usually small (to 18 cm tall by 2 to 2.5 cm broad). The stipe is slender, dark brown, shiny, densely scaly when young and the shallow groove in the upper surface continues into the rachis. The lamina is greyish-green, narrowly oblong and 2-pinnate. The rachis brown, shiny, covered with pale scales. The pinnae are short and usually well separated along the rachis. Pinnules are blunt, and shallowly lobed, lower surface densely clad in pale, flat scales with fine tips; upper surface with or without scattered, long, white hairs. The sori are more or less continuous beneath reflexed margins of shallow lobes, and spores are dark brown and spherical (Duncan & Isaac 1986).

Confusing Species

Cheilanthes distans can be distinguished from small forms of *Cheilanthes sieberi* or *Cheilanthes austrotenuifolia* by the presence of a thick coating of scales on the under-surface of its pinnules (Quirk et al. 1983, Garrett 1996).

DISTRIBUTION AND HABITAT

Cheilanthes distans occurs in inland regions of Australia, and is common along the east coast to mid-northern Queensland, with isolated occurrences in South Australia and Western Australia (Duncan & Isaac 1986, Walsh & Entwisle 1996, Bostock et al. 1998).

Cheilanthes distans was first recorded in Tasmania in 1993 (Garrett 1997), and is currently known from three sites: Apsley River, Royal George, and Avoca (Table 1). The species grows in shallow moss or lichen-covered soils on exposed rock outcrops within dry sclerophyll forest (Plate 2). The three known sites occur on dolerite or sandstone, with northeast to northwest aspects. Co-occurring species include the allied resurrection ferns *Cheilanthes austrotenuifolia* (green rockfern) and *Cheilanthes sieberi* (narrow rockfern), and the xerophytic ferns *Asplenium flabellifolium* (necklace fern), *Pellaea calidirupium* (hotrock fern) and *Pleurosorus rutifolius* (blanket fern). The Apsley River site is surrounded by low dry forest dominated by *Allocasuarina verticillata* (drooping sheoak) (Plate 2), with occasional *Bursaria spinosa* (prickly box), *Acacia mearnsii* (black wattle), *Callitris rhomboidea* (oyster bay pine), *Leptospermum grandiflorum* (autumn teatree) and *Dodonaea viscosa* (broadleaf hopbush) as well as the rare *Teucrium corymbosum*, (forest germander), while the Avoca site also supports scattered *Allocasuarina verticillata.*

The altitude range of known sites in Tasmania is 120 to 350 m above sea level, and the mean annual rainfall 575 to 750 mm. The species' linear range is 48 km, the extent of occurrence 100 km^2, and the area of occupancy is thought to be less than 1 ha.

Table 1. Population summary for *Cheilanthes distans* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied	Number of mature plants
1	Apsley River	Douglas-Apsley National Park	North	Henry	2011 (1993)	4 m²	c. 1200 * (1 genotype)
2	Red Rock (Royal George)	Private	North	St John	1996 (1993)	< 4 m²	c. 1000 * (6 genotypes)
3	Avoca	Private	North	Hanleth	1996 (1996)	Unknown	

NRM region = Natural Resource Management region; * = estimates from Garrett (1997)

Plate 2. *Cheilanthes distans*: rockplate habitat near Apsley River (image by Richard Schahinger)

POPULATION ESTIMATE

Cheilanthes distans can reproduce vegetatively to form a large number of clonal plants that connect via underground rhizomes, making estimates of plant numbers problematic (Table 1). The Apsley River and Royal George subpopulations have been estimated to contain in the order of 1000 to 1200 clones, but with only 1 and 6 genetically distinct individuals, respectively (Garret 1997). The species has been described as being locally common at the Avoca site, though accurate estimates of plant numbers and area of occupancy are not available.

There is no apparent shortage of potential habitat for *Cheilanthes distans* in eastern Tasmania, and it is considered likely that additional sites exist within its known range. However, despite targeted surveys no new sites have been discovered since 1996.

RESERVATION STATUS

Reserved in Douglas-Apsley National Park.

CONSERVATION ASSESSMENT

Cheilanthes distans was listed as endangered on the original schedules of the Tasmanian *Threatened Species Protection Act 1995*. The species qualifies under criterion D:

- total population with an area of occupancy less than one hectare , and in fewer than five locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming extinct within a very short time period.

THREATS, LIMITING FASCTORS & MANAGEMENT ISSUES

The species' rock-outcrop habitat renders sites unsuitable for forestry and most agricultural purposes, with one of the three sites within a National Park. Key threats include physical disturbance by stock, fire and stochastic events.

Stock: The two sites on private property are both open to grazing by sheep, with the slab-like character of the Avoca site making it particularly susceptible to physical disturbance (though there is no evidence to date of the species having been affected).

Garrett (1995) found no field evidence of grazing of xerophytic ferns in Tasmania by domestic, feral or native animals. He noted that *Cheilanthes distans* had been suspected of being

toxic to cattle and sheep. Reports from mainland Australia indicate that the allied species *Cheilanthes sieberi* may give rise to 'staggers' in sheep, and haemorrhagic syndrome in cattle similar to that caused by ingestion of bracken (Everist 1974). Stock have been known to feed on *Cheilanthes* species only during periods of severe food shortage (Everist 1974).

Fire: Fire is unlikely to be a direct threat to *Cheilanthes distans*, as the species is well adapted to survive fire by virtue of its protected rhizome or growing point, while the species' sparsely vegetated habitat means that fires are unlikely to carry (Plate 2). However, burning of vegetation around the species' rock outcrop habitat may have an indirect impact on the species through post-burn tree falls.

Stochastic events: Plants at two of the three known sites occupy only a few square metres, meaning that there is a high risk of local extinction through unforeseen stochastic events. Such small subpopulations may be susceptible to inadvertent losses from a range of natural or anthropogenic activities, including rock-fall, tree-fall, small-scale quarrying or physical disturbance by livestock.

MANAGEMENT STRATEGY

What has been done?

Surveys were conducted and management prescriptions prepared for *Cheilanthes distans* in preparatory studies for the Regional Forest Agreement (Garrett 1997). Negotiations by the Private Forest Reserves Program for a conservation covenant at one site have been unsuccessful. The species is included in a draft recovery plan for threatened Tasmanian ferns (Threatened Species Section 2011).

Management Objectives

The main objectives for the recovery of *Cheilanthes distans* are to:

- prevent the loss or degradation of the known populations;
- increase the information and data available on the location, size and condition of the known subpopulations;
- gain a better understanding of the species' ecological requirements.

What is needed?

Recovery actions necessary to improve the conservation status of *Cheilanthes distans* include:

- survey all known subpopulations and obtain improved estimates of abundance and population size, as well as identifying any threatening processes;
- encourage landholders of the Avoca and Royal George sites to consider protection of the species' habitat through a vegetation management agreement or conservation covenant under the Tasmanian *Nature Conservation Act 2002;*
- conduct extension surveys of suitable habitat in the foothills of the Fingal Valley;
- 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 the known subpopulations and potential habitat;
- collect material from each subpopulation for propagation and ex situ plantings at the Royal Tasmanian Botanical Gardens.

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