Image by Michael Garrett

Cyathea x*marcescens*

skirted treefern

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name: ***Cyathea* x*marcescens*** N.A.Wakef., *Vict. Nat.* 59: 33, figs.1–5 (1942)

Common name: skirted treefern (Wapstra et al. 2005)

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

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

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

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

Tasmanian NRM Regions: **Cradle Coast, North and South**

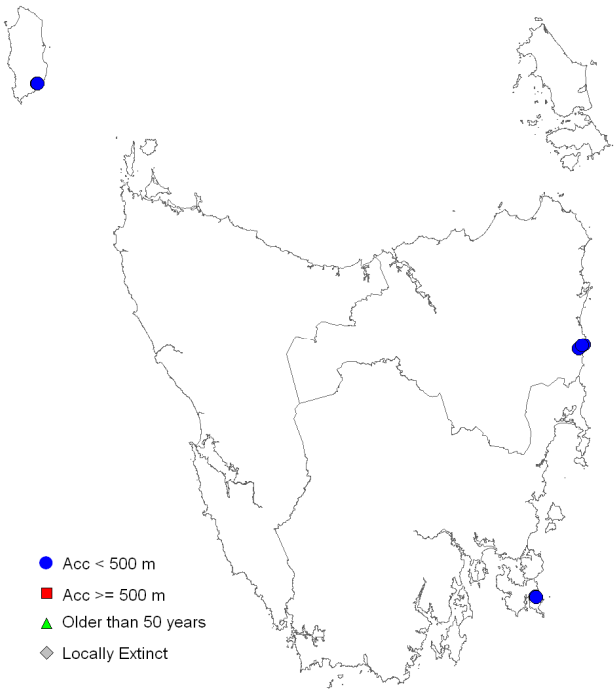

Figure 1. Distribution of *Cyathea* x*marcescens* in Tasmania

Plate 1. *Cyathea* x*marcescens*: crown detail (image by Richard Schahinger)

IDENTIFICATION & ECOLOGY

Cyathea X*marcescens* is a tall treefern in the Cyatheaceae family, characterised by its thick trunk and large crown. In Tasmania it is known from three near-coastal fern gullies in the northeast of the State and on King Island.

Recruitment is from spores resulting from hybridisation between *Cyathea australis* and *Cyathea cunninghamii* (Duncan & Isaac 1986, Garrett 1996) and is only possible if both parent species are present at a site. The taxon may be recognised in the field by considering frond butt (stipe) and scale characters, maturation heights and habitat.

Survey techniques

Surveys for the taxon are best undertaken in mid to late summer when identifiable reproductive material is most likely to be present.

Description

The following description of *Cyathea* X*marcescens* is based upon Duncan & Isaac (1986) and field observations in Tasmania. The species has an erect trunk to 12 m tall and 35 cm diameter with stipe bases persistent above; a skirt of pendent, dead fronds is sometimes present.

Fronds are 3 to 5 m long and form a large crown. Stipes are 20 to 30 cm long, coarse, black and shiny, with sharp conical protuberances. Scales at the base of the stipes are coarse and glossy-brown, almost opaque but with fragile edges, 2 to 6 cm long and tapering, each with a dark red seta (hair) at the tip.

Lamina are mid-green to dark green, paler below, sub-triangular and 3-pinnate with pinnae slightly shorter near the stipe. The primary and secondary pinnae are narrowly oblong with shortly acuminate tips. The lower surface of rachises has scattered scales. Pinnules are attached by their full breadth and are slightly decurrent with margins shallowly toothed to lobed.

Sori are arranged in two rows on the pinnules and are spherical and conspicuous. The indusium is membranous, almost semi-circular, slightly concave, pale with a dark centre and an irregular margin.

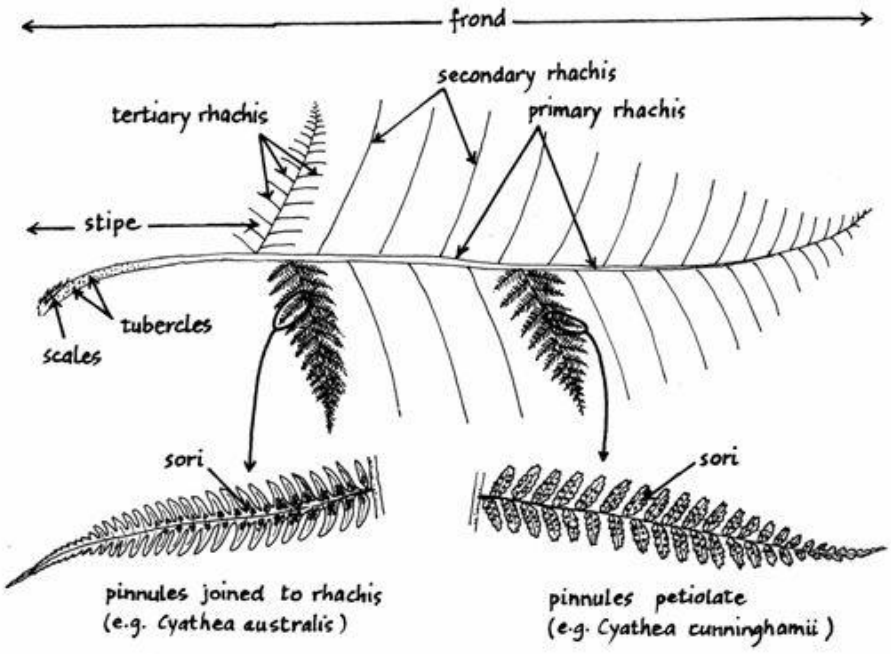

Figure 2. Stylised tripinnate frond of *Cyathea* species (reproduced with permission of Fred Duncan)

Confusing Species

Cyathea X*marcescens* displays typical hybrid vigour when compared to its parents *Cyathea australis* and *Cyathea cunninghamii,* in terms of frond length and the overall size of pinnules and sori (Duncan & Isaac 1986, Garrett 1996 & 1997, Bostock 1998).

Stipe, pinnule and indusium characters may be used to distinguish *Cyathea* X*marcescens* from *Cyathea australis* and *Cyathea cunninghamii*. *Cyathea* x *marcescens* has scales at the base of its stipes that are varnished and dark brown, pinnules that are joined to the rachis, and its sori have semi-circular indusia. *Cyathea australis* has similar pinnule characters and shares the varnished stipe base scales but they tend to be brown, while indusia are absent. *Cyathea cunninghamii* has stipe base scales that are often streaked, pinnules that are petiolate, and large cup-shaped indusia (Duncan & Neyland 1986, Forest Practices Board 2003).

The three species also mature at different heights, 1 to 1.5 m high for *Cyathea* X*marcescens,* 7 to 8 m for *Cyathea cunninghamii* and less than 1 m for *Cyathea australis*. *Cyathea* X*marcescens* and *Cyathea cunninghamii* grow close to watercourses, while *Cyathea australis* usually occurs higher up the slopes (Garrett 1996).

In the genus *Cyathea* the frond butts (i.e. stipe bases) have hard protuberances and are covered in long chaffy scales, while sori are situated on the forks of veins away from the edges of the pinnules. For the other common treefern in Tasmania, *Dicksonia antarctica*, the frond butts are smooth and are clad with a fine soft reddish-brown hair and the sori are marginal (Duncan & Isaac 1986, Garrett 1996).

Taxonomic issues

Cyathea X*marcescens* was described as a separate species by Wakefield (1942). It is now considered to be a sterile hybrid between Tasmania's two other *Cyathea* species, *Cyathea australis* and *Cyathea cunninghamii* (Duncan & Isaac 1986, Garrett 1996), but has been retained as a distinct taxon due to its relatively consistent morphology (Duncan & Isaac 1986, Walsh & Entwisle 1994).

DISTRIBUTION AND HABITAT

Cyathea X*marcescens* is known in Victoria from 'rainforest jungles' about Mount Drummer and Combienbar, the Tarra Valley in South Gippsland, and the Otway Ranges (Walsh & Entwisle 1994).

Cyathea X*marcescens* was first discovered in Tasmania in 1984 in a forested gully at Lower Marsh Creek near Elephant Pass in the State's northeast. The taxon was later found at nearby Little Beach Creek, and also on a tributary of the Grassy River on King Island (Garrett 1997), and was located recently in the south of the State near Fortescue Bay (Table 1, Plate 2). Anecdotal records suggest that the taxon was also present in the Circular Head district (Garret 1997).

Plate 2. *Cyathea* X*marcescens* at Fortescue Bay (images by Richard Schahinger)

Table 1. Population summary for *Cyathea* X*marcescens* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)*	Number of 'mature' plants
1	Lower Marsh Creek	Lower Marsh Creek Forest Reserve	North	Piccaninny	1996 (1984)	Unknown	24 *
2	Little Beach Creek	Little Beach State Reserve	North	Ironhouse	2006 # (1980s)	Unknown	10 *
3	Grassy River (King Island)	Private	Cradle Coast	Grassy	2007 # (1990)	0.0001	2 #
4	Walkers Creek (Fortescue Bay)	State Forest	South	Hippolyte	2010 # (2010)	0.0001	2 #

NRM region = Natural Resource Management region; * = Garrett (1996 & 1997), # = TSS surveys.

The linear extent of the four extant sites in Tasmania is 470 km, with an extent of occurrence of about 33,300 km^2 (which includes large areas of sea and unsuitable habitat). Garrett (pers. comm.) estimates that the taxon occupies a total of 0.2 hectares.

Cyathea X*marcescens* typically grows in close association with *Cyathea cunninghamii* along watercourses in deep sheltered gullies dominated by *Eucalyptus obliqua* (stringybark) or *Acacia melanoxylon* (blackwood). Associated small tree species may include *Pomaderris apetala* (common dogwood), *Acacia dealbata* (silver wattle) and *Hedycarya angustifolia* (australian mulberry; the latter on King Island only), while *Dicksonia antarctica* (soft treefern) is usually prominent. The Fortescue Bay site is somewhat 'atypical' in that the dominants at the upper of the two sites are *Nothofagus cunninghamii* (myrtle) and *Atherosperma moschatum* (sassafras).

POPULATION ESTIMATE

There are four extant subpopulations of *Cyathea* X*marcescens* known in Tasmania, with a total of fewer than 40 'mature' plants (Table 1), with a yet to be confirmed record at Marine Creek near Railton (Allwright & Roberts 2011).

The likelihood of finding new subpopulations is low given the taxons' dependency on the co-occurrence of *Cyathea cunninghamii,* an endangered species known in Tasmania from 18 extant subpopulations (Threatened Species Section 2011).,.

RESERVATION STATUS

Cyathea X*marcescens* is reserved in Lower Marsh Creek Forest Reserve and Little Beach State Reserve.

CONSERVATION ASSESSMENT

Cyathea X*marcescens* 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. It qualifies for endangered under criteria B, C and D:

- area of occupancy less than 0.1 km^2 (10 hectares), known to exist at no more than five locations and continuing decline in number of mature individuals;
- total population estimated to number fewer than 2,500 mature individuals, with a continuing decline observed in the number of mature individuals and no population estimated to contain more than 250 mature individuals;
- total population estimated to number fewer than 250 mature individuals.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

The long-term future of *Cyathea* X*marcescens* in Tasmania is linked inextricably to that of its parents *Cyathea australis* and *Cyathea cunninghamii.* The latter species had until recently been presumed to be extinct in the State's northwest, and is listed as endangered in Tasmania. Land clearance and a high fire frequency are likely to

have been the major contributors to its decline (Neyland 1986, Barnes et al. 2002).

Large trunk-forming ferns such as *Cyathea* X*marcescens* are susceptible to physical damage due to a range of disturbances, e.g., flash flooding, storm damage, fire, and the direct impact of stock (rubbing against the trunks) and machinery. A number of *Cyathea* X*marcescens* on King Island (all juveniles with trunks < 5 m tall) were destroyed in the period 1990–96 by falling trees following storms, and a very old multi-crowned specimen was destroyed by flood at Lower Marsh Creek in 1988. Any activities that disturb the upper catchments of the creek systems in which *Cyathea* X*marcescens* occurs will potentially increase the likelihood of such physical destruction, with an unknown impact on recolonisation opportunities due to changes in deposition and scouring levels etc. The upper catchments of Lower Marsh Creek and Little Beach Creek are on State Forest, and are therefore at some risk of disturbance via logging activities.

Recruitment of *Cyathea* X*marcescens* at a particular site is dependent upon the nearby presence of its parents *Cyathea australis* and *Cyathea cunninghamii*, and the availability of microsites suitable for germination, Protection of *Cyathea cunninghamii* is especially critical, as this endangered species does not become fertile until about 25–30 years old, corresponding to a trunk height of 5–8 m (cf. the more common *Cyathea australis* which may be fertile when only 30 cm high). *Cyathea* X*marcescens* does not bear sori until the plant is 1–1.5 m tall (rarely 5 m), though as noted earlier, plants are sterile.

Due to the low number of 'mature' individuals and the disjunct distribution of the taxon, stochastic events such as fire, flood and prolonged drought pose a considerable risk to *Cyathea* X*marcescens.*

MANAGEMENT STRATEGY

What has been done?

Surveys were conducted and management prescriptions prepared for *Cyathea* X*marcescens* in preparatory studies for the Regional Forest Agreement (Garrett 1997), and follow-up surveys of the sites on King Island and Little Beach Creek, were undertaken in 2007–2008 by personnel with DPIPWE's Threatened Species Section as part of an NRM-funded threatened flora verification project

The subpopulation on State Forest at Fortescue Bay is within a flora Special Management Zone.

Management Objectives

The main objectives for the recovery of *Cyathea* X*marcescens* are to minimise the probability of extinction of wild subpopulations 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 Flora Recovery Plan for Tasmanian Threatened Ferns* (Threatened Species Section 2011).

What is needed?

Recovery actions necessary to improve the conservation status of *Cyathea* X*marcescens* include:

- monitor known subpopulations for the survival and growth of individual plants, and identify any new threats;
- implement recovery actions for the threatened parent species *Cyathea cunninghamii;*
- ensure that the upper reaches of Lower Marsh Creek, Little Beach Creek and Walkers Creek on land managed by Forestry Tasmania are included in streamside reserves of appropriate width;
- include specific fire-exclusion provisions for the species and surrounding habitat in fire management plans for all known occurrences;
- encourage owners of private land supporting the taxon to enter into formal land management agreements that incorporate longer-term habitat maintenance objectives and actions as a high priority;
- conduct extension surveys of suitable habitat, targeting in the first instance known

co-occurrences of *Cyathea cunninghamii* and *Cyathea australis*;

- provide information and extension support to 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.dpiwpe.tas.gov.au/threatenedspecieslists

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