

Pteridophyte Distribution within Tasmanian Forest Reserves

Michael Garrett
PO Box 49
Bicheno, Tasmania

Abstract

In a recent survey of pteridophyte distribution in Tasmania, 64 species of ferns and fern allies were recorded from within Forest Reserves. Most are common, widespread and well represented within State Reserves. One species, Cyathea marcescens, has not been recorded from any State Reserve or National Park, while C. cunninghamii and Sticherus lobatus are inadequately reserved. Asplenium hookerianum and C. marcescens are very rare in Tasmania, three other species are moderately rare, and two species are vulnerable. Thirteen other species, including two unreserved, two vulnerable, and four rare species, have been recorded from State forest outside existing Forest Reserves.

Introduction

Ninety-seven species of pteridophytes from 42 genera are recognised from Tasmania (Garrett 1992). These include one species, *Botrychium australe*, which is possibly extinct in the State. The figures exclude two species confined (within Tasmania) to Macquarie Island, and at least one undescribed species and one taxon of unclear status. Five species are endemic to Tasmania.

Seventy-nine Tasmanian species belong to the true ferns (Filicopsida) and 18 to the fern allies (Psilotopsida and Lycopsida). Twenty-six species are widespread and very common as epiphytes, lithophytes or terrestrial species in rainforest, wet sclerophyll forest and fern gullies. Twenty-four have a more restricted distribution or are less common to rare from

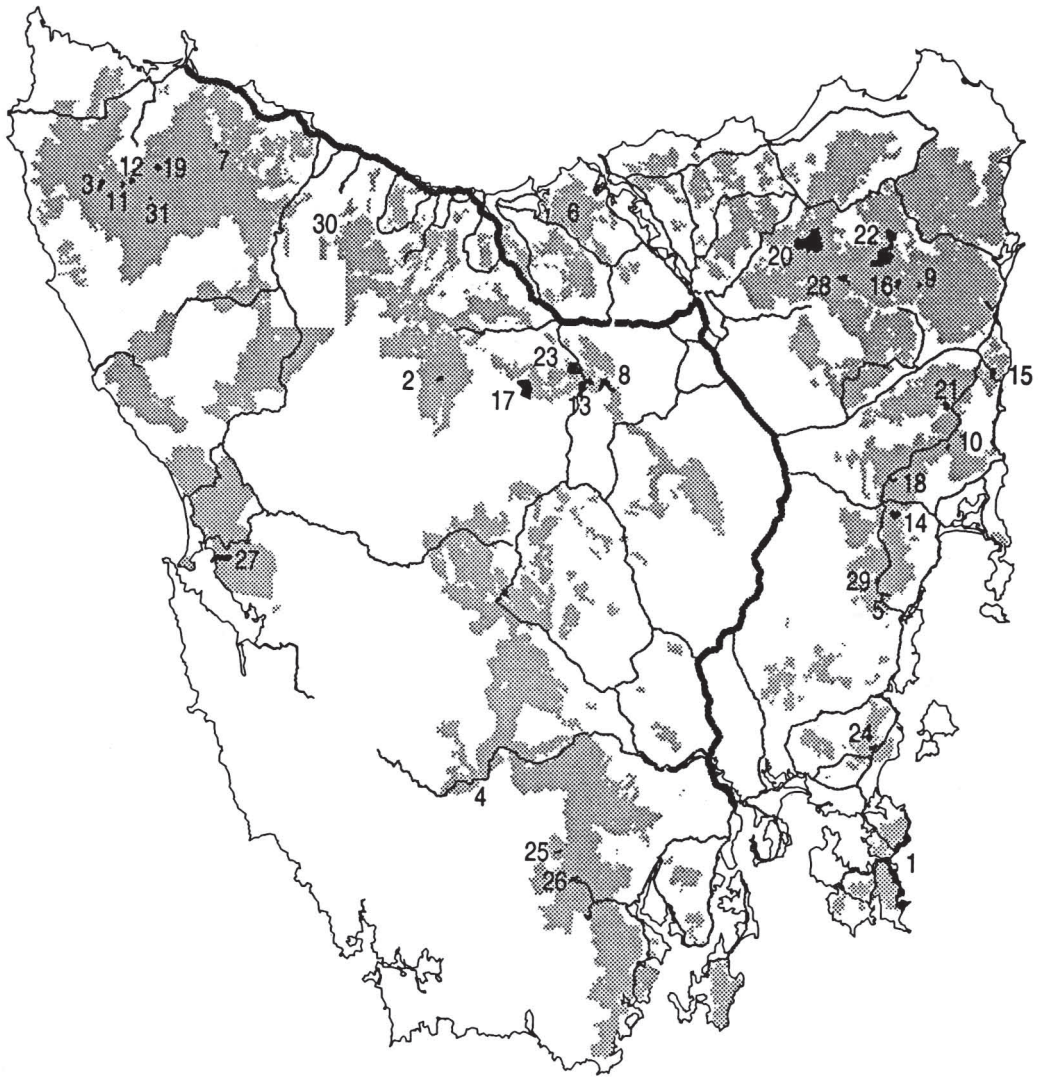
the same habitats. The remainder are distributed through alpine habitats, dry sclerophyll forest, heathland and aquatic habitats.

Between 1975 and December 1992, 44 Forest Reserves, totalling 20 405 ha, were gazetted by the Forestry Commission in Tasmania. Selection has been based on a range of criteria, including recreation, educational/scientific value, and biological or cultural heritage conservation. Some reserves (e.g. Liffey, Milkshake Hills and Sandspit) are well known and frequented by the public. These and several others (e.g. Lower Marsh Creek, Teepookana and the recently gazetted Abel Tasman Forest Reserve) hold a rich diversity of ferns. Although reserves are often centred around scenic features, the ferns and their environment are an equal, if not paramount, attraction for many visitors.

Method

A survey of the distribution of ferns and fern allies within Tasmania was undertaken predominantly during the period of summer 1989 to autumn 1992. Known pteridophyte habitats were visited and the species present within each 10 km x 10 km grid (1:100 000 maps from the Tasmap series, Lands Department, Hobart) were recorded.

Forest Reserves were a valuable source of data, due to ease of access on formed walking tracks and because they allowed sampling of fern-rich, undisturbed sites within areas of regrowth. Thirty-one Forest Reserves were surveyed (see Figure 1). Most of the reserves



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|----|----------------|----|-------------------|----|-----------------|
| 1 | Abel Tasman | 11 | Julius River | 22 | Mount Victoria |
| 2 | Arm River | 12 | Lake Chisholm | 23 | Quamby Bluff |
| 3 | Balfour Track | 13 | Liffey | 24 | Sandspit |
| 4 | Boyd | 14 | Lost Falls | 25 | South Weld |
| 5 | Brookerana | 15 | Lower Marsh Creek | 26 | Tahune |
| 6 | Dalgarth | 16 | Mathinna Falls | 27 | Teepookana |
| 7 | Dip Falls | 17 | Meander | 28 | Tombstone Creek |
| 8 | Drys Bluff | 18 | Meetus Falls | 29 | Tooms White Gum |
| 9 | Evercreech | 19 | Milkshake Hills | 30 | Upper Natone |
| 10 | Hardings Falls | 20 | Mount Maurice | 31 | Wes Beckett |
| | | 21 | Mount Puzzler | | |

Figure 1. Approximate locations of Forest Reserves assessed during the pteridophyte survey. Shaded areas represent State forest.

not assessed had been established primarily for recreational purposes and it is possible that at least some contain fern species not recorded elsewhere.

Nomenclature follows Buchanan *et al.* (1989) except for *Tmesipteris obliqua* (Chinnock 1993), Lycopodiaceae which follows Chinnock's proposed interpretation of that family for the *Flora of Australia* series, and *Calochlaena dubia* (White and Turner 1988). *Pellaea calidirupium*, recently described from New Zealand (Brownsey and Lovis 1990), is presumed synonymous with Tasmanian populations (P.J. Brownsey, pers. comm.). Table 1 gives a summary of name changes.

Categories of conservation status follow Kirkpatrick *et al.* (1991) but, in the light of more recent information, species may not necessarily appear with the same risk codes. An additional grouping for inadequately reserved species would also seem appropriate for those (usually) rare species known to occur in small numbers only from a single State Reserve, and with known larger populations existing outside reserves. (The term 'State Reserve' is used for all reserves managed by the Department of Environment and Land Management, including National Parks, State Reserves and Nature Reserves).

Results and discussion

During the present survey, 64 species of pteridophytes from 29 genera were recorded from 31 Tasmanian Forest Reserves (Table 2). They comprise 55 species of true ferns and nine species of fern allies.

One species, *Cyathea marcescens*, has not been recorded from any State Reserve or National Park, and *C. cunninghamii* and *Sticherus lobatus* are poorly represented within State Reserves.

Asplenium hookerianum and *Cyathea marcescens* are very rare in Tasmania, and *C. cunninghamii*, *Sticherus lobatus* and *Hypolepis amaurobachis* are moderately rare

Table 1. Tasmanian pteridophyte name changes since Buchanan *et al.* (1989). The most recent names are shown on the left.

<i>Tmesipteris obliqua</i> Chinnock	= <i>T. billardierei</i> Endl.
<i>Huperzia australiana</i> (Herter) Holub	= <i>Lycopodium australianum</i> Herter
<i>Huperzia varia</i> (R.Br.) Trev.	= <i>Lycopodium varium</i> R.Br.
<i>Lycopodiella lateralis</i> (R.Br.) B.Øllg.	= <i>Lycopodium laterale</i> R.Br.
<i>Calochlaena dubia</i> (R.Br.) M.D. Turner & R.A. White	= <i>Culcita dubia</i> (R.Br.) Maxon

(M. Garrett, unpublished data). Both *Cyathea* species are vulnerable.

Cyathea marcescens (Photo 1), a putative hybrid, was not recorded from Tasmania until 1985, and was previously thought to be endemic to Victoria. It is presently known from only two locations in Tasmania—Grassy River on King Island and Lower Marsh Creek. The King Island population contains only four plants and is on private land. Nineteen plants from Lower Marsh Creek have reached maturity, although all spores are aborted. Five juveniles are known with certainty (M. Garrett, unpublished data) but it can be difficult to distinguish juveniles from immature *C. australis*. *Cyathea marcescens* occurs at or near creek-level in sheltered gullies, and it would appear to be under no major immediate threat. The Mount Elephant area is subjected to short periods of excessively heavy rainfall, and the aftermath of flash-flooding in the creek is quite apparent. A flood during 1988 destroyed an old multi-crowned specimen of *C. marcescens*, as well as plants of *C. cunninghamii* in Lower Marsh Creek and nearby Little Beach Creek. Although the habitat of the species is relatively insulated from fire, one of two plants in a side tributary has a blackened trunk but healthy crown that appears to have successfully recovered following burning.



Photo 1. *Cyathea marcescens*, one of four treefern species within Lower Marsh Creek Forest Reserve.

Cyathea cunninghamii occurs as a single specimen in the Pieman River State Reserve, and 18 plants (with little regeneration) are known from within the Hastings Caves State Reserve (Neyland 1986). Lower Marsh Creek contains 60 fertile specimens, 86 trunked individuals in various stages of pre-maturation, and at least one hundred and possibly hundreds of sporelings (M. Garrett, unpublished data).

Sticherus lobatus (Photo 2) has often been confused with a variant of *S. tener* (M. Garrett, unpublished data). Within Tasmania, *S. lobatus* is an uncommon species, broadly restricted to the north-west and possibly more widespread there than presently realised. A small population was observed downstream from Dip Falls, and a single large colony was seen on a roadside cutting west of Teepookana Bridge. The latter



Photo 2. *Sticherus lobatus*, an uncommon rainforest fern from north-western Tasmania.

is the southernmost known location for the species in Tasmania, where it co-exists with both variants of *S. tener*.

Asplenium hookerianum (Photo 3) was previously known only from Hellyer Gorge within Tasmania, until late 1992 when it was discovered from Drys Bluff Forest Reserve. This reserve contains a small but strong population, the individual plants appearing much healthier and more vigorous than those at Hellyer Gorge.

The genus *Grammitis* in Tasmania is currently being investigated by B. Robinson who will be recognising *Grammitis meridionalis* from Meetus Falls (B. Robinson, pers. comm.).

Tasmanian Forest Reserves contain eight fern species typical of dry sclerophyll forest, four exclusive to alpine or subalpine vegetation, five from coastal heathland, and no aquatics or semi-aquatics. Of the 50 Tasmanian fern species whose principal habitat is wet forest in its various guises, all 26 very common and

widespread species are well represented within Forest Reserves. Only five of the remaining 24 less common, rare or restricted species were not recorded. However, two of these (*Pneumatopteris pennigera* and *Tmesipteris parva*) are very rare and localised in Tasmania, and two are moderately rare (*Hypolepis muelleri* and *Lindsaea trichomanoides*). The fifth species, *Hypolepis glandulifera*, is confined mainly to coastal gullies of the north and north-east.

Most of the remaining species absent from Forest Reserves are from habitats not typical of State forest. For example, eight are aquatics or semi-aquatics, seven are from alpine or subalpine vegetation and five are of limited occurrence in coastal heathland. However, eight absent species are from dry sclerophyll forest—a proportionally large number when the low total number of species from this habitat is considered. (A similar situation is also apparent in State Reserves. Of the six species absent from both State and Forest Reserves, half are principally of dry

Table 3. Ferns and fern allies recorded from State forest but not found in the 31 Forest Reserves surveyed. Conservation status of each species is given: *u* = unreserved, *i* = inadequately reserved, *v* = vulnerable, and *r2* = rare, with taxa occurring in 20 or less 10 km x 10 km grid squares. (Conservation codes generally follow Kirkpatrick et al. 1991.)

Species	Location in State forest
<i>Doodia caudata</i> (uv)	River Leven
<i>Blechnum cartilagineum</i> (iv)	Tin Hut Creek, Fraser Road (possibly destroyed by logging operations).
<i>Pellaea calidrupium</i> (ur2)	Mt Durham; Fingal Tier
<i>Hypolepis muelleri</i> (ir2)	Tin Hut Creek, Fraser Road; Great Forester River; Retreat Road
<i>Pleurosorus rutifolius</i> (ir2)	Fingal Tier
<i>Lindsaea trichomanoides</i> (r2)	Thornton River (M. Askey-Doran, pers. comm.); Wild Wave River (M. Askey-Doran, pers. comm.).
<i>Asplenium trichomanes</i> ssp. (?) <i>trichomanes</i> (status uncertain)	Mt Durham; Fingal Tier
<i>Cheilanthes sieberi</i>	Granite Knob, Hogans Road; Fingal Tier
<i>Doodia media</i>	Bolpeys Creek, Scamander; Fingal Tier; Murderers Hill, Cygnet River
<i>Hypolepis glandulifera</i>	River Leven
<i>Isoetes gunnii</i>	Derwent River, Lake King William
<i>I. muelleri</i>	Wayatinah Lagoon
<i>Ophioglossum lusitanicum</i>	Fingal Tier; Three Thumbs, Orford; possibly within St Valentines Peak Reserve on APPM freehold land



Photo 3. *Asplenium hookerianum*, a rare terrestrial creek-side fern from Drys Bluff Forest Reserve.

sclerophyll forest habitats). No Tasmanian endemic pteridophytes were recorded from within Forest Reserves. *Gleichenia abscida* is largely confined to quartzitic soils of the south-west and *Apteropteris applanata* is an epiphyte on *Athrotaxis cupressoides* and *A. selaginoides*, or, less commonly, is lithophytic at mid to high altitudes on siliceous substrates. The three endemic *Isoetes* species are obligatory aquatics.

Abel Tasman Forest Reserve exhibited the greatest species diversity, with 43 fern species being recorded. This diversity is to be expected, given the reserve's size (3760 ha, the largest Forest Reserve) and coastal location with a range of fern habitats, including sheltered gullies, heathland and rock outcrops.

Observations on the pteridophyte species in Table 3 were made from State forest outside

Forest Reserves (and outside the South-west Conservation Area). Their conservation status within Tasmania is indicated, with codes generally following Kirkpatrick *et al.* (1991).

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