Image by Matthew Larcombe

Small forkfern

Tmesipteris parva

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name: ***Tmesipteris parva***, N.A.Wakef., *Vict. Nat.* 60: 143 (1944)
Common name: small forkfern (Wapstra *et al.* 2005)
Group: vascular plant, pteridophyte, family **Psilotaceae**

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Not Listed**

Distribution: Endemic status: **Not endemic to Tasmania**
Tasmanian NRM Regions: **North and Cradle Coast**

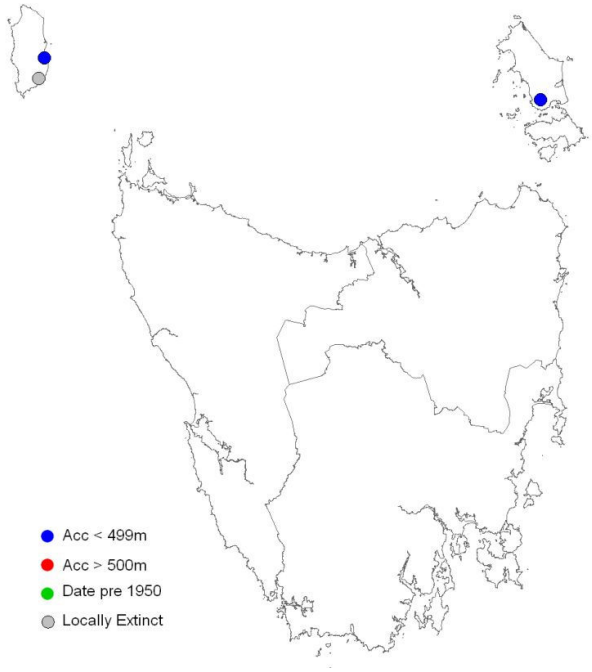

Figure 1. Distribution of *Tmesipteris parva* in Tasmania

Plate 1. *Tmesipteris parva* detail
(Image by Matthew Larcombe)

IDENTIFICATION AND ECOLGY

Tmesipteris parva is a small fern in the Psilotaceae family, known in Tasmania from Flinders Island and King Island. The species occurs in sheltered fern gullies, where it grows on the trunks of treeferns (Plates 1 and 2).

The species has rhizomes that are buried deeply within the fibrous material of treefern trunks. Reproduction is by spore.

Description

Tmesipteris parva is a small, pendulous epiphyte, typically less than 10 cm long, with an unbranched green stem. The following description is adapted from Duncan & Isaac (1986).

Leaves are flattened into one plane and are crowded along the stem (4 to 5 per cm). Leaves are 9 to 14 mm long, soft to firm, simple, gently curved (subfalcate) and lanceolate, with acute to shortly pointed tips (Plate 1). The fertile region of the plant may be near the tip, middle, or towards the base of the stem. A capsule-like structure consisting of two fused sporangia (= synangium) occurs at the tip of a short lateral branch, in the axil of paired, leaf-like appendages that are smaller and narrower than the sterile leaves. The synangium is thick-walled, brown and brittle, splitting across the top. Spores are numerous.

Confusing Species

Tmesipteris parva may be distinguished from the other fork ferns in Tasmania, *Tmesipteris obliqua* and *Tmesipteris elongata,* by its rounded synangia, its relatively short stems and small crowded leaves (Duncan & Isaac 1986, Garrett 1996).

DISTRIBUTION AND HABITAT

Tmesipteris parva occurs in Tasmania, Victoria, New South Wales and Queensland (Garrett 1996), and also reportedly from the Philippines (Duncan & Isaac 1986, Walsh & Entwisle 1994).

Within Tasmania *Tmesipteris parva* is known from creeks leading into Bob Smiths Gully on Flinders Island, and along a creek near Naracoopa on King Island. The species has also been collected from a tributary of the Grassy River on King Island (Garrett 1996, Chinnock 1998) (see Table 1). The linear extent of the three sites in Tasmania is 350 km, the extent of occurrence 2,800 km^2 (which includes large areas of sea), and the area of occupancy is less than 1 ha.

Tmesipteris parva grows within fern gullies on the trunks of either *Dicksonia antarctica* (soft treefern) or *Cyathea australis* (rough treefern). The underlying substrate is Devonian granite on Flinders Island and Precambrian sandstones/siltstones on King Island. The altitudinal range of the three sites is 30 to 160 m above sea level.

POPULATION ESTIMATE

There were at least 1600 plants on 48 host plants in the subpopulation along Bob Smiths Gully on Flinders Island in 2008, with just 10 plants recorded from the Naracoopa subpopulation in 2009 (Table 1). The status of the Grassy River subpopulation is uncertain — surveys in 2007 and 2009 failed to locate plants and it is considered likely that it may be extinct as a consequence of long-term drought.

Plate 2. *Tmesipteris parva* on *Cythaea australis* (Image by Matthew Larcombe)

Table 1. Population summary for *Tmesipteris parva* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of plants
1	Bob Smiths Gully	Strzelecki National Park	North	Loccota	2008 (1990)	0.6	c. 1600
2	Naracoopa	Private	Cradle Coast	Naracoopa	2009 (1970?)	0.000001	10
3	Grassy River	Private	Cradle Coast	Grassy	1970?	Unknown	Probably extinct

NRM Region = Natural Resource Management region.

The likelihood of plants being found in other fern gullies in Strzelecki National Park is considered to be low, as over the past two decades the area has been subject to intensive surveys by botanists with the Department of Primary Industries, Parks, Water and Environment (Harris 2008, pers. comm.).

RESERVATION STATUS

Tmesipteris parva is reserved in Strzelecki National Park on Flinders Island.

CONSERVATION ASSESSMENT

Tmesipteris parva was listed as rare on the Tasmanian *Threatened Species Protection Act 1995* in 1995, and up-listed to vulnerable in early 2008 as part of the Act's five-year review. The species qualifies for vulnerable under criterion D2:

- total population with an area of occupancy less than 5 hectares and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming endangered in a very short time period.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Threats to *Tmesipteris parva* include land clearing and associated impacts, feral pigs, inappropriate fire regimes, climate change and stochastic risks. These are described below:

Land clearing: The two *Tmesipteris parva* sites on King Island occur on private land, and remain at risk from land clearance and associated activities, including changes in hydrology, stock grazing and weed invasion. Both of the known sites are fenced, so stock are considered to be a low risk.

Feral pigs: Feral pigs (*Sus scrofa*) are a significant management problem for the vegetation on Flinders Island, particularly within Strzelecki National Park (Parks and Wildlife Service 2000):

'Pigs are known to cause severe damage in wet gullies through rooting for underground tubers or invertebrates, selective feeding and trampling. These activities cause major ground disturbance leading to erosion and loss of ground species ... This in turn leads to habitat alteration and loss of species diversity…'

The creeklines that support *Tmesipteris parva* on Flinders Island are known to have been heavily disturbed by feral pigs. The soil disturbance may impact indirectly on the fern, through a reduction in colonisation opportunities for its treefern hosts (Harris 2008, pers. comm.).

Inappropriate fire regimes and climate change: A high fire frequency is likely to be deleterious to *Tmesipteris parva*. This scenario might have been considered unlikely given the fire-protected nature of its fern gully habitat, while the species would be expected to regenerate after a single fire from rhizomes buried deeply within the fibrous material of tree-fern trunks (Plates 1 and 2). However, the drying of the species' habitat associated with climate change will heighten the risk of fire, while also leading to a reduction in host plants due to drought.

Stochastic risk: The small size of the extant subpopulations means that the risk of extinction from stochastic events is high.

MANAGEMENT STRATEGY

What has been done?

Targeted surveys for *Tmesipteris parva* were conducted on King Island and Flinders Island by the Threatened Species Section in 2007–2009 under the auspices of NRM-funded threatened flora projects. On Flinders Island *Tmesipteris parva* was found on 48 treeferns along a 600 m stretch of creekline centred around the junction of the main creek leading into Bob Smiths Gully and its western tributary (Schahinger 2009). A total of 1600 *Tmesipteris parva* plants were recorded, half on *Dicksonia antarctica* (on 37 trees) and half on *Cyathea australis* (on 11 trees). Surveys on King Island in 2007 and 2009 located the species along a creek near Naracoopa (10 plants on a single *Dicksonia*), but failed to locate the species in the Grassy River catchment (Wapstra *et al.* 2009). The species' treefern hosts were found to have declined significantly on King Island since the mid 1990s due to drought (Garrett, pers. comm.).

Baseline studies on the impact of feral pigs on the vegetation within Strzelecki National Park were initiated in 2000 (Underwood 2000). Several monitoring plots were established on the eastern side of the Park, including one on private property in Bob Smiths Gully downstream of the *Tmesipteris parva* subpopulation. Copson (2002) has prepared a feral pig management plan for Flinders Island via a Natural Heritage Trust Grant, though the plan has yet to be funded or implemented.

Tmesipteris parva is listed as a priority species requiring consideration in the development of the private land component of the Tasmanian reserve system (DPIWE 1998).

Management Objectives

The objectives for the recovery of *Tmesipteris parva* are to prevent the inadvertent destruction of subpopulations, maintain the viability of existing subpopulations, and promote conditions for the species' successful recruitment. These objectives are consistent with the *Draft Recovery Plan for Tasmanian Threatened Ferns* (Threatened Species Section 2010)

What is needed?

Recovery actions necessary to improve the conservation status of *Tmesipteris parva* include:

- provision of 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 known *Tmesipteris parva* subpopulations and areas of potential habitat;
- determine the status of the Grassy River subpopulation;
- conduct extension surveys of potential habitat close to known sites;
- implement the management actions identified in Copson (2002) to control feral pigs within Strzelecki National Park;
- inclusion within fire management plans for Strzelecki National Park, with specific prescriptions in place to safeguard the known subpopulation;
- negotiate with private landowners to ensure protection of any populations on King Island via land management agreements or formal conservation covenants under the Tasmanian *Nature Conservation Act 2002*;
- monitor the known subpopulations for the survival and growth of individual plants, annually for Naracoopa, and at 3-yearly intervals for Bob Smiths Gully.

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View:
www.dpipwe.tas.gov.au/threatenedspecieslists

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