Gristle fern

Blechnum cartilagineum

TASMANIAN THREATENED FLORA LISTING STATEMENT

Photo by D. Ziegeler

Scientific name: ***Blechnum cartilagineum*** Swartz, *Syn. Fil.* 114, 312 (1806).

Family: **Blechnaceae**

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

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

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

Regional Forest Agreement: **Priority species**

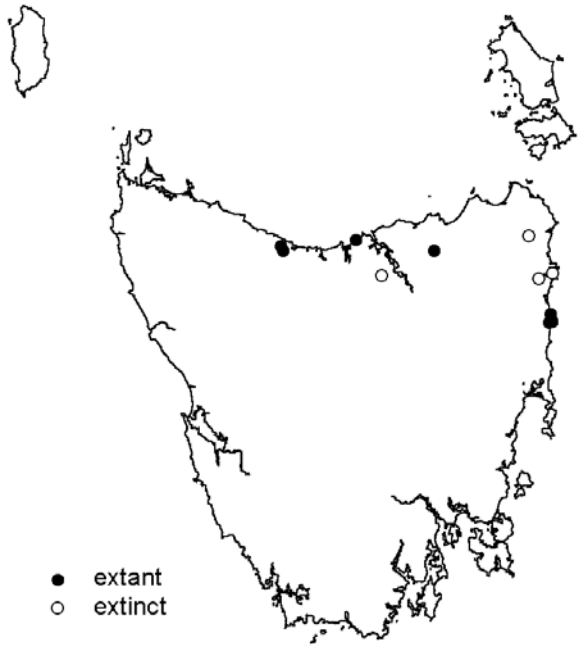

Figure 1. Distribution of *Blechnum cartilagineum* in Tasmania

Figure 2. *Blechnum cartilagineum* (a) fertile frond, and (b) upper side of frond. Photos by O. Carter.

DESCRIPTION

Blechnum cartilagineum is a tufted fern of the Blechnaceae, known from several sites in northern and northeastern Tasmania. The species favours sheltered habitat with moist but well-drained fertile soils within dry sclerophyll forest or on the margins of wet sclerophyll forest.

Identification

The following description is adapted from Duncan & Isaac (1986).

Fronds are clustered towards the tip of a short, thick rhizome and are erect to 150 cm tall and somewhat harsh. The barren and fertile fronds are similar in shape. Stipes are long, grooved, black and scaly at the base.

The **lamina** is mid-green, narrowly triangular to oblong, pinnate with pinnae decreasing only slightly in length towards the stipe.

Pinnae are sessile, alternate, close-set, attached to the rachis by abruptly widened bases (giving a zigzag effect), oblong to linear, 3 to 15 cm long. The tips are pointed and margins are finely toothed. Lateral veins are numerous, parallel and conspicuous on the lower surface.

Sori on the under-surface of pinnules are in a continuous band on each side of the mid-vein. The indusium is membranous, continuous and opening inwards.

Confusing Species

Tall, robust specimens of *Blechnum minus* may occasionally be mistaken for *Blechnum cartilagineum*. However, *B. cartilagineum* has fertile and barren fronds that are morphologically similar, whereas all other *Blechnum* species in Tasmania have dimorphic fertile and barren fronds (Garrett 1996).

DISTRIBUTION AND HABITAT

Blechnum cartilagineum occurs in eastern Australia from Queensland to northern Tasmania (Duncan & Isaac 1986, Entwisle 1994, Chambers & Farrant 1998).

Within Tasmania *B. cartilagineum* is known from McBrides Creek and Dial Creek near Penguin, an unnamed creek in the Asbestos Range, Lone Star Creek near Golconda, and Little Beach Creek and Tin Creek between Falmouth and Chain of Lagoons.

There are historic collections of *B. cartilagineum* from Georges Bay and Glengarry, however surveys over the past 20 years have failed to relocate these sites (Garrett 1997). The linear extent of the extant sites in Tasmania is 198 km, with an extent of occurrence of approximately 3 100 km^2. Garrett (pers. comm. 2001) estimated that the species occupied approximately 2 ha in Tasmania.

Blechnum cartilagineum is a relatively hardy plant that favours sheltered sites along creek lines below 200 m asl, with moist but well-drained fertile soils. Sites are within dry sclerophyll forest or on the margins of wet sclerophyll forest. Dominant eucalypts include *Eucalyptus sieberi, Eucalyptus obliqua*, *Eucalyptus viminalis* and *Eucalyptus amygdalina.* Associated species may include the mesic shrubs *Bedfordia salicina*, *Pomaderris apetala, Olearia argophylla* and *Olearia lirata.* Co-occurring ferns close to creeklines include *Cyathea* species, *Dicksonia antarctica* and *Blechnum nudum*, and in drier sites *Calochlaena dubia* and *Pteridium esculentum* may be common.

RESERVATION STATUS

Blechnum cartilagineum is reserved within Narawntapu National Park, Ferndene State Reserve and Little Beach State Reserve.

POPULATION ESTIMATE

Insufficient data is available to accurately assess the number of mature plants in Tasmania. The largest known population in Tasmania is at upper Little Beach Creek and has been estimated to contain up to 24 000 plants (Table 1). Given that new populations have been discovered in recent years, it is possible that further populations will be found within targeted surveys.

Table 1. Populations of *Blechnum cartilagineum* in Tasmania.

Popn.	Location*	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	McBrides Creek	Ferndene State Reserve	NW	Stowport 4044	2004 (1990)	20–30 m^2	c. 180*
2	Dial Creek	State Forest	NW	Ulverstone 4244	2004 (2004)	30–40 m^2	
3	Asbestos Range	Narawntapu National Park	NW	Port Sorell 4644	1997 (1997)	5 by 10 m	
4	Little Beach Creek	Little Beach State Reserve	N	Ironhouse 6039	2006# (1993)	1–1.5 ha#	c. 24,000*
5	Little Beach Creek	Private	N	Ironhouse 6039	1996 (1984)	6–8 clumps (of 4m^2) over 100m	
6	Tin Creek	Private	N	Ironhouse 6039	1995 (1995)	20 colonies over 1.5 km	
7	Tin Hut Creek	State Forest	N	Lanka 5845	1983 (1981)	10 m^2	Presumed extinct
8	Lone Star Creek	State Forest	N	Nabowla 5244	1999 (1999)		
9	Constable Creek	Unknown	N	Pyengana 5842	1980s		
10	Glengarry	Unknown	N	Exeter 4842	1930		Presumed extinct
11	Georges Bay	Unknown	N	St Helens 6042	1893		Presumed extinct

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

CONSERVATION ASSESSMENT

Blechnum cartilagineum meets the criterion for listing as **vulnerable** on the Tasmanian *Threatened Species Protection Act 1995* because:

- Extent of occurrence is less than 20 000 km^2 and area of occupancy is estimated to be less than 2 000 km^2.
- Estimates indicate that the taxon exists at no more than 10 locations.
- There has been a continuing decline observed in the number of locations.

THREATS

Land clearing and activities associated with forestry are considered to be the greatest threats to *Blechnum cartilagineum* in Tasmania. Low abundance and poor spore production may be limiting the likelihood of population expansion at some sites.

Land clearing and forestry-related disturbances: Large areas of suitable *B. cartilagineum* habitat have been cleared since European settlement. Land clearing is considered to be the greatest threat to *B. cartilagineum* in Tasmania. At least one population at Tin Hut Creek to the northwest of St Helens appears to have been lost through logging activities (Fountain 1983, Garrett 1997), with another at Tin Creek on private property impacted to an unknown degree. Populations at Georges Bay and Glengarry are presumed to be extinct as a result of land clearing for either agricultural purposes, mining and/or residential development.

Several plants at the lower Little Beach Creek site were destroyed during construction of the Four Mile Creek Road at Chain of Lagoons in the 1980s, while up to a quarter of the small colony at the Ferndene State Reserve is thought to have been lost during the construction of a walking track in the early 1990s (Garrett 1997).

Forestry activities in the headwaters of Tin Creek and Little Beach Creek have the potential to increase flash flooding in the area, potentially impacting on *B. cartilagineum* downstream through changes to deposition and scouring levels. Other threatened ferns at risk from the same processes in the area include *Cyathea cunninghamii* and *Cyathea Xmarcescens*.

Poor spore production: Fertile fronds of *B. cartilagineum* are considered to be uncommon to rare in Tasmanian populations. Garrett (1997) noted the apparent absence of fertile material or young plants from the upper Little Beach Creek site (the largest population known in Tasmania), leading to the possibility that the entire colony was a result of vegetative reproduction via underground stolons. Surveys in early 2006 have since revealed a few fertile fronds at the Little Beach Creek site, although spore-grown plants were not found. Sporelings were not observed at any of the *B. cartilagineum* populations surveyed by Garrett (1997), though it is known that spores of Tasmanian plants are viable (Garrett 1997). The species' apparent low levels of sexual recruitment increase the likelihood of local extinctions from the threatening processes discussed above due to limited mechanisms for population expansion and establishment.

MANAGEMENT STRATEGY

The main objectives for recovery of *Blechnum cartilagineum* are to minimise the probability of extinction of wild populations by ensuring habitat protection, and to secure all key populations under effective management regimes within the next five years. These objectives are consistent with the Draft Tasmanian Recovery Plan for threatened ferns (Threatened Species Section 2006).

What has been done?

Surveys were conducted and management prescriptions prepared for *Blechnum cartilagineum* in preparatory studies for the Regional Forest Agreement (Garrett 1997). The species is included in a draft recovery plan for threatened Tasmanian ferns (Threatened Species Section 2006).

Collections from the Ferndene and Little Beach Creek sites have been cultivated at the Royal Tasmanian Botanical Gardens, with several plants now growing in the Gardens' fernery and Tasmanian native section.

What is needed?

Recovery actions necessary to improve the conservation status of *Blechnum cartilagineum* include:

- Pursue conservation covenants or management agreements for populations at Tin Creek and Little Beach Creek.
- Ensure that the Lone Star Creek and Dial Creek populations are placed within Forestry Tasmania Special Management Zones, and that the upper reaches of Tin Creek and Little Beach Creek are adequately protected through streamside reserves.
- Obtain or improve estimates of population size and monitor recruitment in all populations.
- Collect material from each population for propagation and *ex-situ* plantings at the Royal Tasmanian Botanical Gardens.
- Conduct extension surveys in suitable habitat, notably in the Lone Star Creek and Dial Range areas.

ADVICE FOR LANDOWNERS/MANAGERS

The following actions will assist to conserve *Blechnum cartilagineum* in Tasmania:

- If you own land containing *Blechnum cartilagineum* consider some form of long-term protection, e.g. management agreement or conservation covenant.

- Retain all areas of known habitat for the species.
- Avoid any activities that may impact upon the species' habitat e.g. ensure stock is excluded and invasive weeds removed, and avoid frequent burning.
- If you are visiting potential habitat, actively search for new populations and forward site details to the Threatened Species Section.

BIBLIOGRAPHY

Chambers, T.C., and Farrant, P.A. (1998). Blechnaceae, *Flora of Australia* 48: 359–393.

DPIWE (1998). *Strategic plan for the private land component of the CAR reserve system.* Department of Primary Industries, Water and Environment, Hobart.

Duncan B.D. and Isaac, G. (1986). *Ferns and allied plants of Victoria, Tasmania and South Australia.* Melbourne University Press, Carlton, Victoria.

Entwisle, T.J. (1994) Ferns and Allied Plants (Psilophyta, Lycopodiophyta, Polypodiophyta) in: N.G. Walsh & T.J. Entwisle (eds.) Flora of Victoria Volume 2, Inkata Press, Melbourne.

Fountain, M. (1983). *Looking for Blechnum cartilagineum.* Tasmanian Fern Society Newsletter, Number 8 (September 1983).

Garrett, M. (1996). *The Ferns of Tasmania. Their ecology and distribution.* Tasmanian Forest Research Council, Hobart.

Garrett, M. (1997). *Rare or Threatened Tasmanian Forest Ferns.* Report to the Tasmanian RFA Environment and Heritage Technical Committee.

Threatened Species Section (2006) *Draft Flora Recovery Plan: Tasmanian Ferns 2006-2010*, Department of Primary Industries, Water and Environment, Hobart.

Prepared by: Oberon Carter and Richard Schahinger, August 2005

Review Date: 2011

Cite as:

Threatened Species Section (2006) *Listing Statement for* Blechnum cartilagineum *(Gristle fern)*, Department of Primary Industries & Water, Tasmania.

View: http://www.dpiw.tas.gov.au

and follow the links to Natural Environment, Threatened Species, then Threatened Species Lists.

Contact details: Threatened Species Section, Department of Primary Industries & Water, GPO Box 44 Hobart Tasmania Australia 7001. Ph (03) 6233 6556 fax (03) 6233 3477.

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