

Migas plomleyi

Plomley's trapdoor spider



Image from Invertebrata 21,
November 2001 (DPIPWE)

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: *Migas plomleyi* Raven & Churchill, 1989

Common name: Plomley's trapdoor spider

Group: Invertebrate, Arachnida (spider), family Migidae

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

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

IUCN Red List: **Not listed**

Distribution: Endemic status: **Endemic to Tasmania**

Tasmanian NRM Regions: **North**

Tasmanian IBRA bioregions (Version V6): **Northern Midlands**

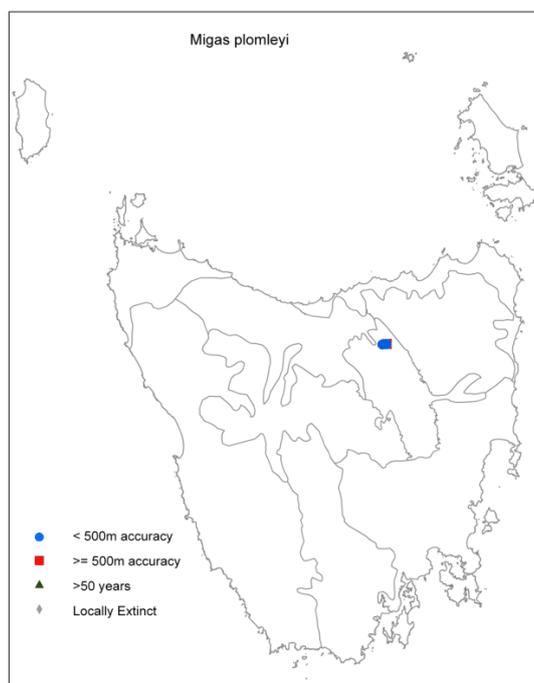


Figure 1. The distribution of *Migas plomleyi*, showing IBRA bioregions (from Natural Values Atlas)



Plate 1. Plomley's trapdoor spider (image from Invertebrata 21, November 2001, DPIPWE)

SUMMARY: Plomley's trapdoor spider (*Migas plomleyi*) is a ground-dwelling spider that is known only from the Cataract Gorge and Trevallyn area near Launceston. It has only been collected on two occasions (1987 and 2001). The species lives in small sac-like chambers constructed of silk, about 2 cm across and closed with a thin lid or trapdoor. Plomley's trapdoor spider has been found living on the surface of moss-covered boulders on the slopes above the Cataract Gorge.

The threats to the species are not well understood but may include predation by European wasps, and habitat degradation from weed invasion and recreational activities such as rock-climbing.

IDENTIFICATION AND ECOLOGY

Plomley's trapdoor spider (*Migas plomleyi*) is one of only three endemic mygalomorph spiders (including trapdoor and funnelweb spiders) in the family Migidae found in Tasmania and the only one with an above-ground burrow. Plomley's trapdoor spider is a member of a Gondwanan genus (*Migas*) that only occurs in Tasmania and New Zealand, and is considered an important part of Tasmania's relictual fauna (Fearn 2003).

Plomley's trapdoor spider (Plate 1) is a small spider, known only from female specimens. The total body length is 6.40 mm. The carapace is brown (or green-brown in freshly moulted specimens) and the abdomen black. The chelicerae are very short; the fangs with two longitudinal ridges along their length and a basal medial tooth. All legs are of similar diameter and range from 6.48 to 7.40 mm long.

The thin parchment-like sacs used for shelter (up to 2 cm long) are similar in colour to the surrounding moss or soil (Raven & Churchill 1998) and are located at the moss/soil interface on dolerite boulders (Leighton 2001a). The sac door is concave, thin and moss-covered, and opens directly to the outside (Leighton 2001b). An above-ground, parchment-like shelter sac is typical of *Migas* in New Zealand but atypical for most Australian mygalomorphs (Raven & Churchill 2001). Population density is probably <3/100 m² in suitable habitat.

Very little is known about the biology and ecology of Plomley's trapdoor spider but much can be assumed based on other mygalomorph spiders (Fearn 2003). Females are probably long-lived and sedentary. Males construct similar retreats to the females in the same micro-habitats until mature and able to search for mates during favourable conditions. These species are extremely prone to desiccation, particularly juveniles. Plomley's trapdoor spider probably has very limited dispersal abilities because it favours small, moist, humid, moss micro-habitats and does not live in a burrow (unlike many spiders, mygalomorphs disperse by walking rather than by gossamer "ballooning"). Plomley's trapdoor spider probably feeds on small invertebrates that wander past the entrance of the shelter.

Survey techniques

Surveying for Plomley's trapdoor spider involves careful hand-searching of moss-covered rocks, logs, tree trunks and branches in areas of potentially suitable habitat. Once a parchment-like shelter sac is detected, careful examination is needed to determine occupancy. Pitfall traps have been previously set up in Cataract Gorge with the hope of catching the elusive male of the species (Leighton 2001a) but the method is destructive to habitat and individuals. However, Fearn (2003) suggests a carefully planned pitfall trapping effort to secure a male specimen for descriptive taxonomic purposes.

Confusing species

Plomley's trapdoor spider most closely resembles *Migas nitens* (which is known from soil-covered cliffs about 2 m above the water of the River Derwent in the Cornelian Bay area, and not from the Launceston area) but differs in having preening combs on one of its metatarsi, and lacking spines on the patellae of the legs, having relatively smaller median eyes, and straight, rather than folded, spermathecae (Raven & Churchill 1998). Specialist confirmation is recommended for any specimens suspected to be Plomley's trapdoor spider.

Table 1. Population summary for the Plomley's trapdoor spider

	Location	Tenure	NRM region*	1:25 000 mapsheet	Years last (first) seen	Extent of subpopulation (ha)	Number
1	Cataract Gorge	Crown land (Council)	North	Launceston	(1987) 2005	Unknown	3 (1987) 2 (2001) 1 disused sac (2003) 1 (2005)
2	Above Trevallyn Dam	Trevallyn Nature Recreation Area	North	Launceston	2001	Unknown	1

*NRM region = Natural Resource Management region.

DISTRIBUTION AND HABITAT

Plomley's trapdoor spider is endemic to the Launceston area of Tasmania (Figure 1, Table 1). Plomley's trapdoor spider occurs on moss-covered dolerite boulders in sheltered (i.e. shaded) sites on steep south-facing to east-facing slopes above the South Esk River (Fearn 2003). It is known from Cataract Gorge, just below the First Basin (Raven & Churchill 1998, Leighton 2001b, 2002, Fearn 2003) and from similar habitat just above Trevallyn Dam (Leighton 2002, Fearn 2003). Interspersed habitat is generally open grassy woodland and is considered to be unsuitable for the species. It is possible that Plomley's trapdoor spider has a wider distribution, although limited surveys (Leighton 2002) did not detect the species in Notley Gorge or Cora Linn.

POPULATION PARAMETERS

Number of subpopulations: 2

Number of locations: 1

Extent of occurrence: 1.37 km²

Linear extent: 3.2 km

Area of occupancy (actual): < 1 ha

Area of occupancy (as per IUCN criteria) = 12 km²

Number of mature individuals: unknown

Largest subpopulation: unknown

It is not possible to estimate the population size of Plomley's trapdoor spider accurately as the area of occupancy is unclear and there has been no formal sampling of population densities. Based on the limited surveys, the population density may be less than 3 individuals per 100 m² within suitable habitat (Leighton 2001a).

RESERVATION STATUS

The only known subpopulations of Plomley's trapdoor spider occur within the Cataract Gorge Reserve (managed by Launceston City Council) and Trevallyn Nature Recreation Area.

CONSERVATION STATUS

Plomley's trapdoor spider is listed as endangered under the Tasmanian *Threatened Species Protection Act 1995* (the Act), meeting criterion D – total population extremely small and area of occupancy very restricted. It was first listed on the Act in 1995 as rare, due to its limited range and low population number (at the time known from a collection of just 3 individuals), making the species subject to stochastic risk. The listing was reviewed in 2015 and was updated to endangered.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

There is very little information on potential threatening processes for Plomley's trapdoor spider. It is probably subject to predation by native wasps (and possibly also European wasps) and is prone to death by flooding of burrows and burrow dislodgement. Other potential threats are described below and are mainly associated with habitat disturbance and modification from events such as weed control, fire and recreational activities.

Urban habitation and associated effects:

Plomley's trapdoor spider occurs very close to populated areas of Launceston, in a habitat that already includes numerous weeds and exotic invertebrates. There have been some efforts at removing weeds from sites known to support Plomley's trapdoor spider and its potential habitat, but the impact of the vegetation modification on the species is unknown (Fearn 2003).

Rockclimbing and bushwalking: Rock-climbing, a popular recreational activity in Cataract Gorge, has the potential to remove lichens and other microhabitat from surfaces where the species occurs, or from potential habitat. The site near Lake Trevallyn is dissected by a rough walking track, use of this track may impact the species. Launceston City Council has produced a document that addresses this concern (LCC 2011).

Fire: Severe wildfire has the potential to deleteriously affect the delicate microclimate associated with the moss-covered microhabitat of Plomley's trapdoor spider.

Water management: Plomley's trapdoor spider occurs upstream and downstream of Trevallyn Dam. It is possible that the flooding of the South Esk River eliminated some sites supporting the species but the species has otherwise persisted during a long history of flood and scour events.

Climate or microclimate change: Changes in rainfall patterns or in the microclimate of the Cataract Gorge area could affect Plomley's trapdoor spider, given that it is dependent on lush lichens and mosses for shelter. The species is likely to quickly disappear from areas that are opened up by clearing (e.g. as may happen with broadscale shrubby weed removal), which lowers the humidity of the microclimate (R. Raven pers. comm. 2001, cited in Leighton 2001a).

MANAGEMENT STRATEGY

Management objectives

The main objective for the management of Plomley's trapdoor spider is to maintain and protect existing subpopulations. The management of discrete areas of mossy boulder habitat is crucial to protecting Plomley's trapdoor spider (Fearn 2003).

What has been done?

Management planning: The importance of subpopulations and potential habitat of Plomley's trapdoor spider within the Trevallyn Nature Recreation Area is recognised in the *Trevallyn Nature Recreation Area Management Plan 2008* (PWS 2008), which recommends careful management (especially in relation to prescribed burning) of potential habitat. The Launceston City Council have incorporated the requirements of the species into several of their management planning documents associated with the Cataract Gorge Reserve (e.g. GHD 2008), including fire management (AVK 1999), weed management (LCC 2008) and rock climbing (LCC 2011).

Targeted surveys & monitoring: Knowledge of Plomley's trapdoor spider has resulted from the original opportunistic discovery of the species in 1987 (Raven & Churchill 1998) and three small-scale funded surveys conducted by the Launceston Environment Centre in 2001 and 2002 (Leighton 2001a, 2002) and 2003 (Fearn 2003).

What is needed?

- To better understand the distribution of the species –
 - undertake comprehensive surveys within the Cataract Gorge area to establish the full extent of the species' occurrence;
 - survey similar sites (which have not already been surveyed) within a radius of about 30 km of known sites, to attempt to locate further subpopulations of the species;
- To allow full taxonomic description of the species – undertake sampling with the intention of capturing a male specimen;

- To avoid impacts on known subpopulations – assess whether any rockclimbing routes contain subpopulations of Plomley's trapdoor spider and whether any routes should be closed;
- To assist in protection of the species –
 - prepare weed management plans for any areas with known sites or potential habitat for Plomley's trapdoor spider that take account of the ecological requirements of the species;
 - update population information held in the *Natural Values Atlas* online database, especially information on collecting sites from 1987 and 2001/2002;
 - ensure implementation of the relevant management plans for the reserves in which Plomley's trapdoor spider occurs, especially in relation to weed and fire management;
 - provide information and extension support to relevant Natural Resource Management organisations, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat of Plomley's trapdoor spider.
- To increase public awareness of the species – provide interpretation at appropriate sites to increase public interest in conservation of the species.

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