

Plesiothele fentoni

Lake Fenton Trapdoor Spider

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by Michael Driessen

Common name: Lake Fenton Trapdoor Spider

Scientific name: *Plesiothele fentoni* (Hickman)

Group: Invertebrate, Arachnida, Mygalomorphae, Dipluridae, Hexathelinae

Name history: *Hexathele fentoni* Hickman, 1936

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**
Tasmanian NRM Regions: **South**

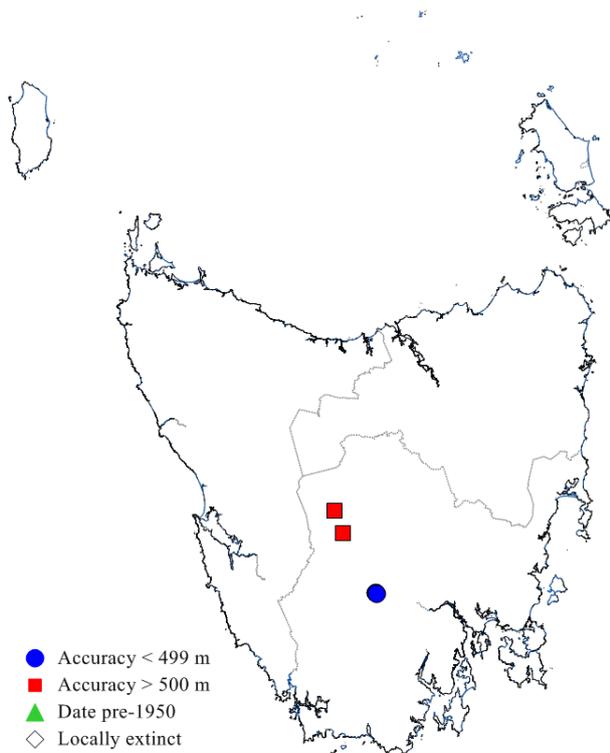


Figure 1. The distribution of the Lake Fenton Trapdoor Spider, showing NRM regions



Plate 1. The Lake Fenton Trapdoor Spider (image by Karen Richards)

SUMMARY

The Lake Fenton Trapdoor Spider is a ground-dwelling spider growing to 1.5 cm in length, with a yellow-brown and strongly patterned abdomen. The species is known only from Lake Fenton in the Mount Field National Park, where it occurs in subalpine woodland, and tentatively from the Tarraleah area, where it occurs in tall wet forest. Like other trapdoor spiders, the Lake Fenton Trapdoor Spider lives in burrows lined with silk. The burrows do not have a lid, are about 5 cm deep and entrances are about 1 cm in diameter. The key threats to the species are habitat loss through potential new tourist developments and maintenance of existing infrastructure, and from trampling or damage to the soft moss where the species makes its burrows. If the species is confirmed as more widespread (e.g. near Tarraleah), forestry activities may be a threat because the known sites may be within wood production forests.

IDENTIFICATION AND ECOLOGY

The Lake Fenton Trapdoor Spider (*Plesiothele fentoni*) is a ground-dwelling trapdoor spider. Hickman (1936) described the species as *Hexathele fentoni*. Subsequently, Raven (1978) in a major review of the systematics of the spider subfamily Hexathelinae, established the monotypic genus *Plesiothele* for the species.

The Lake Fenton Trapdoor Spider (Plate 1) has a body length ranging from 1.1 to 1.5 cm with legs about 1.5 cm long. The female is larger than the male. The abdomen is yellow-brown and strongly patterned on the back with 5 to 6 pairs of dark oblique stripes and a central dark stripe. There are six spinnerets (appendages for handling the silk) that are yellowish brown clothed with black hairs (Hickman 1936, Raven 1978).

Other species in the trapdoor group are generally long-lived, spending their whole life in either burrows in the ground or under rocks and logs. Males mature at several years of age when they wander in search of mates and after mating usually die (Bryant & Jackson 1999). These species use burrows as both refuge and to ambush prey. The Lake Fenton Trapdoor

Spider lives in burrows lined with silk, are about 5 cm long and situated in rocky areas with deep well-drained moss. Burrow entrances (Plates 2 and 3) are approximately 1 cm in diameter and do not possess lids. Entrances are surrounded by moss fronds glued back, often in a star-shaped arrangement.

Survey techniques

There is no specific recommended method for conducting surveys for the Lake Fenton Trapdoor Spider. Surveys to date (e.g. Raven 1978, Doran & Driessen 2001) were targeted at known locations and were essentially unsystematic with respect to timing, length, intensity and pattern of survey. The chance discovery of the species in the Tarraleah area was from a more systematic pitfall trapping survey for invertebrates but was not targeting the Lake Fenton Trapdoor Spider. Identification of most spiders, even to the level of family, requires an expert with considerable understanding of the taxonomic characters of the various families.



Plate 2. Burrow (arrowed) of the Lake Fenton Trapdoor Spider showing the lack of lid and surrounding moss (image by Michael Driessen)

Confusing species

The Lake Fenton Trapdoor Spider is currently the only species in its genus. The genus is distinguished from other genera in the Hexathelinae family by the comparatively short, arched cephalic (head) region of the female, and the stout, twisted embolus (an organ that carries the opening of the sperm duct at its tip and is inserted into the female's copulatory

opening during mating) and absence of a tibial spur in the male (Raven 1978).

The Lake Fenton Trapdoor Spider can be distinguished from similar, more common spiders found in the same area by the specific chevron pattern on its abdomen (although others are similar), and the long spinnerets at the end of the abdomen (Hickman 1936, Raven 1978). Hickman (1936) and Raven (1978) discuss in detail the distinctiveness of the Lake Fenton Trapdoor Spider.



Plate 3. Burrow of the Lake Fenton Trapdoor Spider showing the lack of lid and surrounding moss (image by Karen Richards)

DISTRIBUTION AND HABITAT

The Lake Fenton Trapdoor Spider is endemic to Tasmania (Table 1, Figure 1). For many years, the species was known from a single location (Lake Fenton area near Mount Field). The species may also occur near Tarraleah (near Hornes Dam and D’Arcys Bluff), which is based on the (tentative and unconfirmed) identification of specimens collected by Forestry Tasmania in pitfall traps in 1992 (Doran 2002) and surveys conducted in 2017 by the Forest Practices Authority.

There are several database records for the Lake Fenton Trapdoor Spider from the immediate vicinity of Lake Fenton, which includes the original collection by Hickman in 1932 and subsequent collections by Rob Raven in 1987 and 1995. The species is restricted to the immediate downstream vicinity of Lake Fenton itself. More recent surveys (e.g. Doran & Driessen, unpubl. data 2001) also recorded the species from this area but made very minor

range extensions (in the order of a hundred metres or so).

In the Lake Fenton area, the species occurs amongst deciduous beech (*Nothofagus gunnii*) and pandanis (*Richea pandanifolia*) (Plate 3). In the Tarraleah area, the species occurs in *Eucalyptus delegatensis* forest with a myrtle beech (*Nothofagus cunninghamii*) and sassafras feature (*Atherosperma moschatum*) understorey.

The likelihood of the species’ current known distribution being its actual distribution is difficult to ascertain. However, as it has not been recorded at any additional sites since being located near Tarraleah, the distribution is considered to be highly fragmented and patchy. Therefore it is unlikely that, unless dedicated and targeted surveys are undertaken, the distribution of the Lake Fenton Trapdoor Spider will be substantially altered.



Plate 3. General location of burrows of the Lake Fenton Trapdoor Spider at Lake Fenton (image by Michael Driessen)

POPULATION PARAMETERS

Given the large disjunctions between the three subpopulations, it is not considered meaningful to calculate the extent of occurrence by construction of a minimum convex polygon. The area of occupancy at Lake Fenton has not been estimated. The area of occupancy at the two sites near Tarraleah is virtually impossible

to calculate because the species was identified as part of invertebrate pitfall trapping data, and not a systematic survey for the species nor its potential habitat.

There is insufficient information available to estimate the total population size of the Lake Fenton Trapdoor Spider. The type material was collected and described by Hickman (1936), who reported nests of the species to be fairly numerous in mossy banks among deciduous beeches and grass-trees near the accommodation huts at Lake Fenton. Raven (1978) described the genus *Hexathele* from 1 male and 3 female specimens. Neither Hickman (1936) nor Raven (1978) relate how many additional specimens were observed at the collection sites. There are no abundance measures for more recent records.

RESERVATION STATUS

The Lake Fenton subpopulation is within Mount Field National Park.

CONSERVATION STATUS

The Lake Fenton Trapdoor Spider was listed in 1995 as endangered on the Tasmanian *Threatened Species Protection Act 1995*, meeting criterion D, specifically D1 (total population estimated to number fewer than 250 mature individuals) and D2 (total population with an area of occupancy less than 0.01 km² (1 hectare), 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 extinct within a very short time period).

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Key threats to the Lake Fenton Trapdoor Spider (at the Lake Fenton site) are habitat loss through development and infrastructure maintenance and from trampling or damage to the soft moss where the species makes its burrows (Bryant & Jackson 1999). If the species is more widespread (e.g. near Tarraleah), forestry activities may be a threat because the known sites may be within wood production forests.

Development and infrastructure maintenance: Lake Fenton is currently used as a drinking water catchment area that supplies some of the city of Hobart's water (Hobart Water 2000). Furthermore, the development of new walking trails and other visitor amenities, ongoing maintenance and new developments associated with the catchment area (e.g. tracks, fences etc.) and the National Park (e.g. new walking trails. etc.) potentially threaten the species' habitat (Bryant & Jackson 1999). The effect of these potential threats to date is unknown. However, they are unlikely to be significant because land managers are well aware of the importance of the site and actions to date have demonstrated that the species can be appropriately managed (e.g. additional surveys, implementation of site-specific management actions).

Trampling: The confirmed and most well known subpopulation occurs near Lake Fenton in Mount Field National Park, an area that receives a substantial number of visitors, which use the park for recreation. The soft mossy substrate in which the species lives is susceptible to damage from human traffic (Bryant & Jackson 1999). However, any future impact is presumably low because of existing infrastructure at the site directing visitors away from sensitive areas (Hobart Water 2000; PWS 2002).

Forestry activities: Unconfirmed subpopulations may occur within wood production forests on State forest in the Tarraleah area. Surrounding areas are subject to native forest silviculture (mainly clearfell, burn and sow silviculture). The effect of this potential threat to date is unknown. Future effects are difficult to predict because it is unknown how widespread the species may be in the area, although it is suspected to be present in more sites than indicated currently because other pitfall traps had similar-looking specimens but have not been identified as yet.

Table 1. Population summary for the Lake Fenton Trapdoor Spider

	Location	Tenure	NRM region*	1:25 000 mapsheet	Years seen	Extent of subpopulation (ha)	Abundance
1	Lake Fenton	Mount Field National Park	South	Dobson	1932, 1987, 1995, 2001, 2017	c. 1 ha	Unknown
2	Tarraleah area (Hornes Dam)	State forest	South	Tarraleah	1992	Unknown	Unknown
3	Tarraleah area (D'Arcys Bluff)	State forest	South	D'Arcys	1992	Unknown	Unknown

*NRM region = Natural Resource Management region.

Climate change: The trend towards a warmer climate may increase the frequency of and exacerbate the effect of wildfire on the habitat of the Lake Fenton Trapdoor Spider. A warmer climate may also result in a less favourable microclimate for the species at the higher elevation sites it appears to favour.

Stochastic risk: The likely small size of the subpopulations of the Lake Fenton Trapdoor Spider, and the apparent fragmented distribution (with no opportunity for genetic exchange between subpopulations) exposes the species to a stochastic risk of extinction.

MANAGEMENT STRATEGY

What has been done?

Targeted surveys & monitoring: Surveys have been conducted for the Lake Fenton Trapdoor Spider in the vicinity of the original collection site at Lake Fenton. In 1987, Dr Robert Raven rediscovered the species in the vicinity of the original collection site, Bryant & Jackson (1999) also report that the species was recorded from this location in 1995, and more recently Doran & Driessen in 2001 (unpublished data) recorded the species from the same area. Other surveys have been opportunistic e.g. the chance discovery of the species in by-catch of pitfall trapping in the Tarraleah area (Doran 2002).

Consultation: The presence of the Lake Fenton Trapdoor Spider was considered in 2001 when modifications to infrastructure near Lake Fenton were proposed by Hobart Water (Doran & Driessen unpublished data).

Forestry management: The Lake Fenton Trapdoor Spider was not included in the original version of the *Threatened Fauna Adviser*, a decision-support system used by the forest industry to take account of threatened fauna in wood production forests managed under the *Tasmanian Forest Practices Code* (FPB 2000, 2002), and has been included in the latest review of the *Adviser* (M. Wapstra pers. comm.).

Management objectives

- Prevent the loss or degradation of habitat supporting known subpopulations;
- Identify new subpopulations of the species;
- Increase the information and data available on the location, size and condition of known subpopulations;
- Improve the understanding of the ecological requirements of the species.

What is needed?

- To more fully document the species' distribution – undertake extension surveys radiating out from known sites, using targeted search methods followed by systematic surveying of any populations found;
- To monitor the status of the species – monitor extant subpopulations of the Lake Fenton Trapdoor Spider and any new subpopulations discovered in the course of surveying;
- To more fully document the distribution of the species – confirm identification of the

specimens from the Tarraleah area, presently tentatively assigned to the Lake Fenton Trapdoor Spider;

- To improve protection of the species – consider defining a Special Management Zone under Forestry Tasmania’s Management Decision Classification planning system (Orr & Gerrand 1998) around the two sites on State forest near Tarraleah;
- To improve protection of the species – update existing management plans applicable to sites supporting the Lake Fenton Trapdoor Spider, including the *Mount Field National Park, Marriotts Falls State Reserve & Junee Cave State Reserve Management Plan* (PWS 2002) and the *Lake Fenton/Lady Barron Creek Drinking Water Catchment Management Plan* (Hobart Water 2000);
- To improve protection of the species – provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat of the Lake Fenton Trapdoor Spider.

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Permit: A permit is required under the *Tasmanian Threatened Species Protection Act 1995* and *Nature Conservation Act 2002* to “take” (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen or products of a listed species. Additional permits may also be required under other *Acts* or regulations to take, disturb or interfere with any form of wildlife or its products, e.g. on reserved land.