

# *Pterostylis falcata*

sickle greenhood

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by Marie Macdermott,  
Tasmanian Herbarium

**Scientific name:** *Pterostylis falcata* R.S.Rogers, *Proc. Roy. Soc. Vict. ser.2*, 28(1): 106, t.9 (1915)

**Common name:** sickle greenhood (Wapstra et al. 2005)

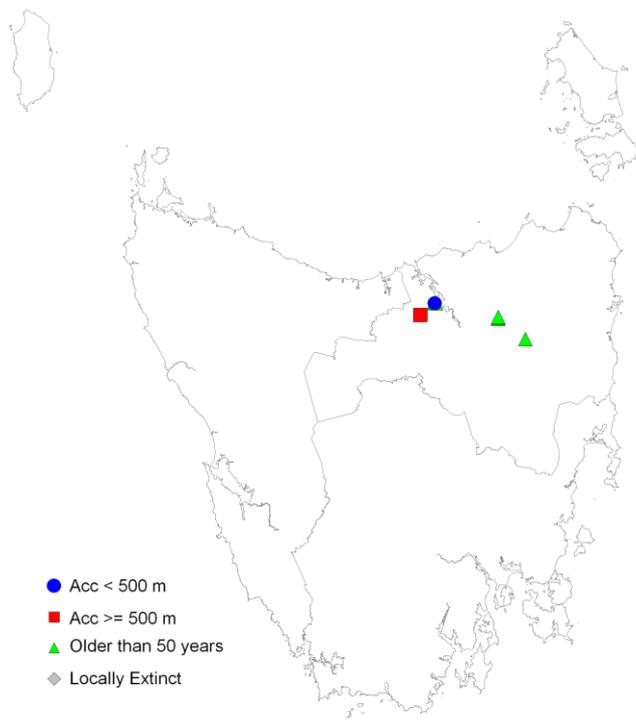
**Group:** vascular plant, monocotyledon, family **Orchidaceae**

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

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

**Distribution:** Endemic status: **not endemic to Tasmania**

Tasmanian NRM Regions: **North**



**Figure 1.** Distribution of *Pterostylis falcata* in Tasmania, showing Natural Resource Management regions



**Plate 1.** *Pterostylis falcata* (ex NSW) (image by Marie Macdermott, Tasmanian Herbarium)

**SUMMARY:** *Pterostylis falcata* (sickle greenhood) is a terrestrial orchid that in Tasmania has been recorded from only 3 or 4 localities in the north of the State, presumably from moist to wet forests on fertile substrates. The species has not been recorded since 1972 and the precise location of sites is unknown. Given the limited collections and time since the last recording, the total population in Tasmania is presumed to be small, with fewer than 250 mature plants, and likely to occupy less than 5 ha. Loss of habitat through historical clearing may explain the fragmented distribution of the species in Tasmania. While a better understanding of the distribution and needs of the species is required to guide management, the most important known need of the species is to prevent destruction and degradation of potential habitat in the general vicinity of recorded sites.

#### IDENTIFICATION AND ECOLOGY

*Pterostylis falcata* is a single-flowered tall herb in a group of plants known as greenhoods. The name greenhood arises because the dorsal sepal and petals are united to form a predominantly green hood-like structure that dominates the flower. When triggered by touch, the labellum flips inwards towards the column, trapping any insect inside the flower, thereby aiding pollination as the insect struggles to escape. Greenhoods are deciduous terrestrial herbs that have fleshy tubers, which are replaced annually. At some stage in their life cycle all greenhoods produce a rosette of leaves.

*Pterostylis falcata* reproduces from seed but the species also forms clonal colonies. The plants flower for a short period each year (in the order of weeks) before being fertilised though old flowers often persist on the stalk for many weeks. Seed production and release is likely to follow shortly after fertilisation. Natural mortality in all phases of its above-ground existence is expected to be low and caused by grazing (by native marsupials, or stock, if present), drought-stress (in periods of extreme drought only) and fire. However, the species is likely to survive into subsequent years, re-establishing from the underground tuber (Jones et al. 1999).

*Pterostylis falcata* is a summer-flowering greenhood (Jones et al. 1999). On the mainland, flowering is between September and January (Jones 2006) but herbarium records from Tasmania suggest a peak in Tasmania in late December into January (Wapstra et al. 2012).

The response of *Pterostylis falcata* to disturbance is largely undocumented but its preferred habitats have relatively low fire frequencies. A too frequent and/or high intensity fire regime is likely to be detrimental. Occurrences appear to be highly localised meaning that some forms of disturbance such as intensive grazing and soil compaction are likely to be unfavourable.

#### Survey techniques

Surveys should be conducted during the species' peak flowering period, which is identified as late December into January (Wapstra et al. 2012). Detecting the rosette of leaves prior to flowering amongst dense shrubs is likely to be very difficult. Detection will be most successful when flowers are fully open but older flowers may still be identifiable, extending the survey window for 1 to 2 weeks, depending on seasonal and local conditions. Fresh plants and/or high quality digital images (showing scale) are recommended to allow expert identification of plants suspected to be *Pterostylis falcata*.

#### Description

Plants that develop or do not develop flowers have similar rosettes of basal leaves. They have 4 to 7 bright green leaves that form a rosette, which in flowering plants encircle the base of the scape or are scattered up the scape. The leaves are sessile with an ovate-lanceolate lamina and entire margins. They are 30 to 80 mm long and 14 to 25 mm wide. The fleshy and smooth flowering scape is 15 to 30 cm tall. The inflorescence is a solitary green and white flower that is held erect and is sometimes semi-nodding. It is 60 to 80 mm long and 20 to 24 mm wide in plants from mainland Australia, though Tasmanian plants tend to be in the 45 to 65 mm range. The galea (hood) has an apex that is curved forward like a sickle and is usually held horizontally, the dorsal sepal being much longer than the petals. The dorsal sepal is 60 to

75 mm long and 18 to 24 mm wide, ending in a long tapered point. The petals are shallowly curved and pointed and are 45 to 55 mm long and 7 to 9 mm wide. The tips of the dorsal sepal and petals are loosely joined. The lateral sepals very loosely embrace the galea leaving a wide lateral gap. The sinus between the lateral sepals is deeply notched and slightly bulging. The free points of the lateral sepals are 30 to 40 mm long and are held erect above the galea or are recurved. The labellum protrudes from the sinus, even when reflexed. It is curved, dark green to brown, and narrowly ovate to lanceolate, 25 to 34 mm long and 3 to 4 mm wide. The column is 20 to 23 mm long.

[description based on Jones 1998, Jones et al. 1999, Jones 2006]

### Confusing species

In Tasmania, there has long been confusion surrounding the identification of specimens resembling *Pterostylis falcata* and *Pterostylis furcata*, exacerbated by the recent description of *Pterostylis lustra* (Jones 2006), a species confused with *Pterostylis falcata*, and the recognition that *Pterostylis Xingens* (a hybrid entity between *Pterostylis falcata* and *Pterostylis nutans*) does occur in northern Tasmania (Jones 2006). The image ascribed to *Pterostylis falcata* in the *Orchids of Tasmania* (Jones et al. 1999) is almost certainly an image of *Pterostylis lustra*. Clements (1989) treated *Pterostylis falcata* and *Pterostylis furcata* as synonymous but Jones (1998) resurrected the two entities for Tasmania, recognising *Pterostylis furcata* as endemic and *Pterostylis falcata* as widespread on the mainland but uncommon in Tasmania. Jones et al. (1999) noted that many records of *Pterostylis falcata* are not backed up by herbarium specimens and have probably arisen from confusion with the smaller and more widespread *Pterostylis furcata*.

*Pterostylis falcata* is recognised as a summer-flowering species with large green and white flowers that are 60 to 80 mm long (by far the largest of all Tasmanian greenhood species), with a prominent sickle-shaped galea that is usually held horizontally, a long protruding labellum, and long (30 to 40 mm) free points on the lateral sepals that are sometimes swept

back (recurved). The species is most similar to *Pterostylis furcata* which has smaller flowers (up to 40 mm long), the flower is held obliquely erect, and the free points of the lateral sepals are much shorter (22 to 30 mm long).

### DISTRIBUTION AND HABITAT

*Pterostylis falcata* occurs in Victoria, South Australia, New South Wales, Queensland and the Australian Capital Territory (Jones 1998, Jones et al. 1999). In Tasmania, the species has been recorded around Exeter, Mount Barrow, and Ben Lomond (Table 1, Figure 1). Habitat on the mainland is moist to wet areas in open forests and shrubland, especially near streams and swamps, in clay and peaty loams, from lowland to 1,000 m elevation (Jones et al. 1999). The habitat in Tasmania can only be guessed at based on locality information, but is suspected to be moist to wet forests on fertile substrates.

### POPULATION PARAMETERS

In Tasmania, *Pterostylis falcata* has been recorded from 3 or 4 subpopulations (Table 1), though location details are imprecise, and the species has not been formally recorded for many decades. The extent of occurrence of the species is estimated to be in the order of 340 km<sup>2</sup>, and the linear range about 60 to 70 km. The area of occupancy is unknown, but given the time since the species has been seen and the paucity of records, is presumed to be less than 1 ha.

Jones (2006) notes that the species is often common on mainland Australia. However, as the species has not been recorded often and not for many decades, it is presumed that Tasmanian subpopulations are small, making it reasonable to assume that the total population does not exceed 250 mature individuals. The likelihood of further subpopulations being detected is relatively high, based simply on the extent of potential habitat meaning that range extensions and infillings are likely. The success of extension surveys is often associated with surveys that radiate out from known sites. However, the precise location of *Pterostylis falcata* in Tasmania is unknown so that discovery is likely to be serendipitous.

**Table 1.** Population summary for *Pterostylis falcata* in Tasmania

	Subpopulation	Tenure	NRM Region	1:25000 Mapsheet	Years seen	Area occupied (ha)	Number of individuals
1	Exeter *	unknown	North	Exeter	1951 1948	unknown	unknown
2	Highway between Glengarry and Frankford, near turnoff to Westbury	unknown	North	Exeter	1972	unknown	unknown
3	Mount Barrow, or foothills of Mount Barrow	unknown	North	unknown	1923 1922	unknown	unknown
4	Ben Lomond	unknown	North	Giblin?	1930 1929	unknown	unknown

NRM = Natural Resource Management region; \* The Exeter observations possibly belong to subpopulation 2.

### RESERVATION STATUS

The reservation status of *Pterostylis falcata* is unknown because of imprecise location details though the records from Ben Lomond and Mount Barrow may fall within the bounds of state reserves.

### CONSERVATION ASSESSMENT

*Pterostylis falcata* was listed as rare on the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being, as the species occurred in 20 or less 10 x 10 km Australian Map Grid Squares in Tasmania. This listing encompassed *Pterostylis lustra*, which was described by Jones in 2006 and has now been listed in its own right. *Pterostylis falcata* in the narrow sense was listed as endangered in April 2016 meeting criterion D:

- total population estimated to number fewer than 250 mature individuals:

### THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

While limited information on subpopulations of *Pterostylis falcata*, make it difficult to assess specific threats and develop management strategies, the threats to the species are similar to those faced by many threatened orchid species with widespread and fragmented distributions and usually low population numbers. Risks to the species are exacerbated by the dependence on mycorrhizal fungi, which

may make the species susceptible to additional factors. It is likely that the species was, and still is, naturally rare in Tasmania, being at the southern limit of its distribution, with a naturally fragmented and patchy occurrence.

#### **Land clearing and/or habitat modification:**

In Tasmania, threats to *Pterostylis falcata* may have included extensive historical land clearing and/or associated habitat modification for primary production, irrigation, mining and forestry. The pattern of land clearing and/or habitat modification may explain the contemporary distribution and remain a threat to the species in Tasmania.

#### **Inappropriate disturbance:**

*Pterostylis falcata* is a herb requiring light and some space to allow annual emergence, growth and seed-set, although long persistence in the absence of specific disturbance events is likely to be possible for this species, which occurs in less fire-prone habitats than many of the State's native orchids. The likely moist to wet forest habitat close to streams implies a low fire frequency but potentially high intensity and broadscale fires when they do occur.

#### **Forestry activities:**

Large areas of potential habitat of *Pterostylis falcata* occur within potential wood production forests, although most sites suitable for the species are unlikely to be highly suitable for commercial forestry and are likely to be excluded informally from forestry operations in streamside reserves.

**Climate change:** It is possible that even minor shifts in average seasonal conditions may have an adverse impact on locally restricted species such as *Pterostylis falcata*, especially if other ecological factors such as an appropriate fire/disturbance regime are absent.

**Stochastic risk:** The presumed often highly localised distribution of subpopulations of *Pterostylis falcata*, combined with also presumed relatively low abundance, would make the species subject to inadvertent or chance events at probably all of its known sites.

## MANAGEMENT STRATEGY

### Management objectives

The main objectives for the recovery of *Pterostylis falcata* are to prevent the loss or degradation of known subpopulations, and increase the number of known subpopulations through survey.

### What has been done?

**Recovery planning:** *Pterostylis falcata* was formally included in *the Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (TSU 2006).

**Surveys:** There have only been informal surveys for the species, all with negative results. Janes et al. (2008) attempted to locate the species in the Mount Barrow area without success.

**Clarification of status:** In July 2009, Hans, Annie and Mark Wapstra examined all the specimens of *Pterostylis* held at the Tasmanian Herbarium that may reasonably have been confused with, or indeed be, *Pterostylis falcata*, supplemented with examination of material from the Queen Victoria Museum & Art Gallery and the National Herbarium in NSW. They concluded that Tasmania definitely supports *Pterostylis falcata*, *Pterostylis furcata*, *Pterostylis lustra* and *Pterostylis Xingens*, and formally re-named specimens accordingly.

### What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- survey potential habitat in the general vicinity of recorded locations to relocate the species and, if successful, undertake extension surveys, radiating out from confirmed subpopulations;
- 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;
- contingent on relocating the species, develop management agreements with private landowners and public land managers, and ensure that current priorities for the species are incorporated into the Private Land Conservation Program's (DPIPWE) reservation strategies.

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