



Image by Oberon Carter

Pterostylis lustra

small sickle greenhood

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: *Pterostylis lustra* D.L.Jones, *Austral. Orchid Res.* 5: 87 (2006)

Common name: small 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: **Cradle Coast**

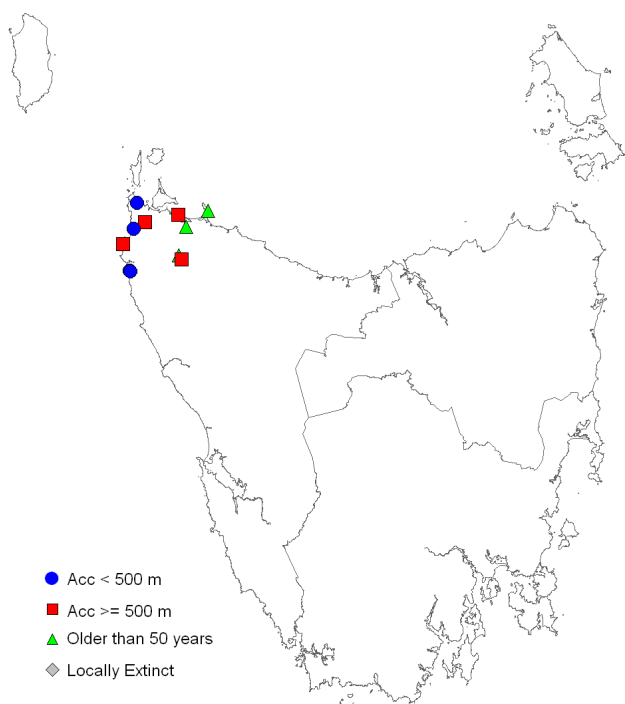


Figure 1. Distribution of *Pterostylis lustra* in Tasmania, showing Natural Resource Management regions



Plate 1. Inflorescence of *Pterostylis lustra* (image by Oberon Carter)

SUMMARY: *Pterostylis lustra* (small sickle greenhood) is a terrestrial orchid that in Tasmania is known from just 10 localities on the northwest coast, occurring in near-coastal swamp forest and scrub. While population data is limited it suggests that the total population in Tasmania is small, with fewer than 250 mature plants, and likely to occupy less than 5 ha. This makes the species susceptible to inadvertent or chance events. Loss of habitat through historical clearing may explain the apparent 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 known and potential habitat.

IDENTIFICATION AND ECOLOGY

Pterostylis lustra is a single-flowered short herb in a group of orchids known as greenhoods. In this group 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 underground tubers, which are replaced annually. At some stage in their life cycle all greenhoods produce a rosette of leaves.

Pterostylis lustra 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 lustra is a summer-flowering greenhood (Jones 2006b). On mainland

Australia, flowering is from November and February (Jones 2006a&b) but herbarium records from Tasmania suggest a peak in Tasmania in late October to mid November (Wapstra et al. 2012).

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

Survey techniques

Surveys should be conducted during the species' peak flowering period, which is identified as late October to mid November (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. Surveying large swathes of potential habitat that is undisturbed (e.g. dense swards of closed swamp forest scrub) may be a poor use of resources.

Description

Plants that develop or do not develop flowers have similar rosettes of basal leaves. They have 6 to 10 bright green fleshy leaves with 3 to 6 in a basal rosette and the remainder scattered up the flowering scape. The leaves are oblong to elliptic with entire margins, and are 20 to 60 mm long and 8 to 15 mm wide. The flowering scape is smooth and 8 to 20 cm tall and 3 to 3.5 mm thick. The inflorescence is a solitary green and white flower that is held erect and is sometimes semi-nodding. It is 30 to 45 mm long and 20 to 25 mm wide. 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 green and white dorsal sepal is 45 to 55 mm long and 17 to 20 mm wide. It bulges at the base and ends in a long tapered acute to acuminate point. The petals are oblong and

falcate, 35 to 40 mm long and 6 to 7 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 being deeply notched and slightly bulging. The free points of the lateral sepals are 20 to 30 mm long, linear, and are held erect or recurved. The labellum protrudes prominently when set. The lamina of the labellum is oblong-elliptic, 15 to 25 mm long and 3 to 3.5 mm wide, curved, and dark brown to blackish with a subacute apex. The basal appendage is recurved, about 4.5 mm long and penicillate. The column is 17 to 19 mm long.

[description based on Jones 2006a & b]

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 2006b), 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 2006a). While *Pterostylis lustra* was only formally described in 2006 (Jones 2006b), the entity had been long recognised, at least on mainland Australia. For example, Backhouse & Jeanes (1995) noted under their listing of *Pterostylis falcata* in *The Orchids of Victoria* that a smaller-flowered form with a shorter, more erect galea inhabits watercourses dominated by *Leptospermum lanigerum* (woolly tea-tree) in coastal and hinterland areas. The image ascribed to *Pterostylis falcata* in the *Orchids of Tasmania* (Jones et al. 1999) is almost certainly an image of *Pterostylis lustra*.

Pterostylis lustra is recognised as being basically very similar to *Pterostylis falcata* but the plants are much more slender, the leaves and flowers are smaller, and the labellum is smaller and narrower (Jones 2006b). Fresh plants and/or high quality images (showing scale) are recommended to allow expert identification of plants suspected to be *Pterostylis lustra*.

DISTRIBUTION AND HABITAT

Pterostylis lustra occurs in southern Victoria, southeastern South Australia and northwest Tasmania (Jones 2006b). In Tasmania, the species has been confirmed from several near-coastal sites between Smithton and Temma, and a smaller number of sites slightly further inland (Table 1, Figure 1).

On the mainland, the species is restricted to swampy areas under dense thickets of woolly teatree (*Leptospermum lanigerum*) in permanently wet black alkaline mud, at elevations of 5 to 50 m (Jones 2006b). In Tasmania, the species mainly occurs in coastal to near-coastal swampy habitats. For example, the site from the Preminghana area is from the edge of a wetland (lake) amongst grassy *Leptospermum lanigerum* scrubby forest. Tiger Flats is a broad grassy/scrubby flat surrounded by stabilised grassy dunes and denser swamp forest thickets.

POPULATION PARAMETERS

In Tasmania, *Pterostylis lustra* has been recorded from 10 subpopulations (Table 1), Some database records previously assigned to *Pterostylis falcata* from northwest Tasmania are probably *Pterostylis lustra* but in the absence of herbarium specimens, this cannot be confirmed (Table 1). The extent of occurrence of the species is estimated to be 1,700 km², and the linear range about 85 km. While most records of the species have little information on the size of occurrences, the area of occupancy in Tasmania is assumed to be less than 1 to 5 ha.

On the mainland, Jones (2006b) noted that although localised the species can be common. However, available information (Table 1) suggests that Tasmanian subpopulations are all small, making it reasonable to assume that the total population does not exceed 1,000 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 absence of the species from King and Flinders islands, despite relatively extensive potential swamp habitat, is surprising, given the species'

Table 1. Population summary for *Pterostylis lustra*

	Subpopulation	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of individuals
1	Tiger Flat	Arthur-Pieman Conservation Area	Cradle Coast	Sundown	2005 (1988)	unknown	unknown
2	West Point	Arthur-Pieman Conservation Area	Cradle Coast	Marawah	1992	unknown	unknown
3	Harcus River	Private property	Cradle Coast	Cameron	1976	unknown	unknown
4*	Preminghana	Preminghana Indigenous Protected Area	Cradle Coast	Cameron	2003	unknown	2
5*	Roger River	Private property	Cradle Coast	Roger	1944	unknown	unknown
6*	North Welcome Heath	Private property	Cradle Coast	Grim	1991	unknown	unknown
7*	Trowutta	unknown	Cradle Coast	Roger	1999	unknown	unknown
8*	Perkins Island	Crown land ¹	Cradle Coast	Montagu	1999 (1998)	unknown	unknown
9*	Smithton	unknown	Cradle Coast	Smithton	1926	unknown	unknown
10*	Stanley	unknown	Cradle Coast	Stanley	1939	unknown	unknown

NRM = Natural Resource Management region; ¹ Recommended for reservation under DPIPW's Crown Land Assessment and Classification Project (CLAC Project Team 2005); * records supported by herbarium specimens.

distribution in southern Victoria. However, discovery is likely to be serendipitous because targeted surveys of potential habitat are likely to be resource-hungry and inefficient.

RESERVATION STATUS

Pterostylis lustra is reserved in the Arthur-Pieman Conservation Area and the Preminghana Indigenous Protected Area. Perkins Island has been nominated as a reserve under DPIPW's Crown Land Assessment and Classification Project.

CONSERVATION ASSESSMENT

Pterostylis lustra was included in the listing of *Pterostylis falcata*, which 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.

Pterostylis lustra was listed in its own right 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 some subpopulations of *Pterostylis lustra*, 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 lustra* may have included extensive historical land clearing and/or associated habitat modification for land uses including 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 lustra* 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 permanently wet swamp forest habitat implies a low fire frequency but potentially high intensity and broadscale fires when they do occur.

Forestry activities: Limited areas of potential habitat of *Pterostylis lustra* 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 lustra*, especially if other ecological factors such as an appropriate fire/disturbance regime are absent.

Stochastic risk: The presumed often highly localised distribution of some subpopulations of *Pterostylis lustra*, 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 lustra* 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 lustra* was formally included in *the Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (Threatened Species Unit 2006) under the concept of *Pterostylis falcata*.

Surveys: There have only been informal surveys for the species.

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.

- 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;
- undertake extension surveys of potential habitat, radiating out from confirmed subpopulations to maximise the chance of success;
- undertake demographic monitoring of at least one subpopulation annually to determine the needs of the species and better inform management;
- 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.

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