Pterostylis atriola

snug greenhood

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Mark Wapstra

Scientific name: ***Pterostylis atriola*** D.L.Jones, *Austral. Orchid Res.* 3: 140 (1998)
Common name: snug greenhood (Wapstra et al. 2005)
Group: vascular plant, monocotyledon, family **Orchidaceae**
Name history: *Speculantha atriola*

Status: *Threatened Species Protection Act 1995*: **rare**
Environment Protection and Biodiversity Conservation Act 1999: **not listed**

Distribution: Endemic status: **Endemic to Tasmania**
Tasmanian NRM Region: **Cradle Coast, North, South**

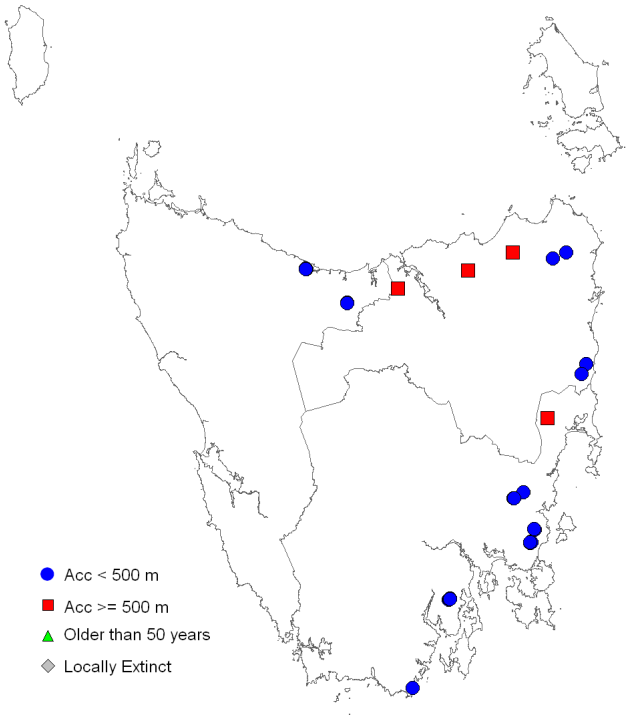

Figure 1. Distribution of *Pterostylis atriola*

Plate 1. *Pterostylis atriola* (image by David Tng)

IDENTIFICATION AND ECOLOGY

Pterostylis atriola is a multi-flowered tall herb in a group of orchids 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 terrestrials that have fleshy tubers, which are replaced annually. At some stage in their life cycle all greenhoods produce a rosette of leaves.

Pterostylis atriola is part of a complex of four closely related species with similar features. Species in this complex are easily identifiable by their multi-flowered scapes with small inward-facing flowers (which are apparently semen-scented) and are unlikely to be confused with any other taxa. The species are easily recognised during the flowering phase because of their height and distinctive flower arrangement that makes them easily distinguishable from other herbs on the forest floor.

Pterostylis atriola reproduces entirely from seed in association with mycorrhizal fungi. The friable nature of the pollen and basal siting of the stigma suggest autogamy (self-pollination), although this requires confirmation (Jones 1998). Clonal colonies are apparently absent in this group of greenhoods i.e. the "*Speculantha*" species-complex (Jones 1998).

Pterostylis atriola plants may not flower every year, though when they do, they flower for a short period each year (in the order of weeks) before being fertilised and old flowers often persist on the stalk for many weeks. Natural mortality in all phases of its above-ground existence is likely to be low and caused by grazing (by native marsupials, or stock, if present), drought-stress (in periods of extreme drought only) and fire (wildfire). It is noted, however, that the species is likely to survive into subsequent years because of the presence of an underground tuber (Jones et al. 1999).

Pterostylis atriola appears to respond favourably to disturbance but does not rely on it for subpopulations to persist. For example, individuals in the subpopulation at Snug Plains occur on poorly-maintained 4WD tracks but also extend into adjacent burnt and unburnt shrubby forest. Individuals in the subpopulation in the Wielangta area occur on both the edge of old fire trails and throughout *Eucalyptus obliqua* dry sclerophyll forest that was burnt about 3 years previously. Individuals in the subpopulation near Railton are most strongly associated with old trails through the selectively harvested forest.

Survey techniques

Pterostylis atriola is an autumn-flowering greenhood with a short flowering period between January and March, with a peak in February (Wapstra et al. 2008). It can only be positively identified from fresh or fertilised flowers, perhaps as late as May at some sites.

Description

Pterostylis atriola has 1 or 2 leaf rosettes on lateral growths arising from the base of the scape (flower stem) or on sterile plants. The 3 to 6 leaves are dark green and have an ovate lamina 3 to 14 mm long and 4 to 9 mm wide with entire margins, a subacute apex and 3 to 7 mm long petioles. The scape is slender, wiry and 20 to 35 cm tall. Plants have 1 to 10 inward-facing striped dark green and white flowers that are 8 to 9.5 mm long and 2.5 mm wide with a brown apex and scabrous distal parts of the dorsal sepal and petals. The apex of the galea (hood-like structure) is curved and the dorsal sepal and petals are of similar length. The dorsal sepal is boldly striped, ovate-lanceolate and 12 to 15 mm long and 6.7 mm wide. The erect lateral sepals closely embrace the galea. They are conjoined with tapered and curved forward free points about 3 mm long, the tips just higher than the galea, the sinus (gap) step-like at the top, flat or gently sloping and very shallowly notched, with an opening about 1 mm wide. The petals are linear-oblong, 8.5 to 10 mm long and 2 mm wide, strongly curved and subacute. The labellum is linear-elliptical, 3 to 3.5 mm long and 1.5 mm wide, blunt and not visible through the sinus in any position.

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

Confusing species

Pterostylis atriola is part of a complex of four closely related species (within Tasmania) with similar features, included by some authors within the genus *Speculantha* (Jones & Clements 2002). Within this complex, *Pterostylis atriola* is distinguishable by its relatively taller scape, small narrow green and white flowers with brown petals, a flat sinus when viewed from the side, a very narrow frontal opening to the flower, scabrid bumps on the dorsal sepal, attenuate free points that extent just above the galea, and a linear-elliptical reddish labellum (Jones et al. 1999).

Pterostylis atriola differs from *Pterostylis aphylla* in having taller, wiry, as opposed to fleshy, flowering stems and a narrower opening to the flower. It differs from *Pterostylis parviflora* in that the tip of the hood is rough to touch and consistently brown, and the flowering stem is generally taller. In *Pterostylis parviflora*, the opening to the flower is wider and the tip of the labellum can be seen through the opening. *Pterostylis atriola* differs from *Pterostylis uliginosa* in having taller and wiry, as opposed to fleshy, flowering stems, and flowers that are rough to touch at the tip and with a narrower opening to the flower. The flowers of *Pterostylis uliginosa* are smaller and shiny green without brown tips.

DISTRIBUTION AND HABITAT

Pterostylis atriola is endemic to Tasmania. It is known from widely separated localities ranging from near-coastal lowland and hinterlands in the north and east to 600 m above sea level in the southeast (Figure 1, Table 1). The linear range of the species is about 300 km and the extent of occurrence about 31,500 km^2. The area of occupancy is more difficult to calculate as most subpopulations occur over much less than 1 ha but several are represented by numerous sites spread over several kilometres of track and adjacent forest (e.g. Snug Tiers) or 10s of hectares of suitable habitat (e.g. Back Run Hills, Wielangta Hill).

Pterostylis atriola occurs on generally stony soil on a wide range of substrates including Jurassic dolerite and Devonian granodiorite and on varying aspects/topographies (exposed ridges, upper slopes, frost hollows, gorges, rock plates). It occurs in dry sclerophyll forest, typically with an open understorey (e.g. shrubby *Eucalyptus obliqua* forest, shrubby/heathy *Eucalyptus amygdalina* forest) (Jones 1998, Jones et al. 1999, Jones 2006).

POPULATION ESTIMATE

It is likely that *Pterostylis atriola* has a wider distribution than shown in Figure 1. Several subpopulations have been detected since the description of the species in 1998 and further survey effort by people familiar with the species at the appropriate time of year is likely to detect further subpopulations. However, focused surveys are considered impractical given that the species appears to occur in a wide range of vegetation types, at different altitudes and on different substrates.

The area of occupancy and the number of mature individuals indicated in Table 1 are likely to be underestimates as extensive searching has not been undertaken at most locations. Some subpopulations have proven to be more extensive than originally reported. For example, when found in 1997, the total size of the Snug Tiers subpopulation was estimated at 80 to 100 mature individuals though over 1,000 plants were estimated following more extensive searching in the vicinity in 2009, making this the largest subpopulation known to date. While 82 individuals were counted in the subpopulation at Railton in 2008, the size of the subpopulation was estimated to be in excess of 250, and possibly much higher based on the 9 to 10 ha extent of potential habitat (ECO*tas* 2008). Current estimates suggest that the total population size of *Pterostylis atriola* is in the low 1,000s, up from 120 to 130 mature individuals when the species was listed in 2001.

The number of plants in any one subpopulation in any year is likely to fluctuate according to seasonal conditions (e.g. amount of winter/spring rain), disturbance history (e.g. fire) and other factors (e.g. natural vegetation succession). However, the number of plants at discrete sites is generally and consistently small suggesting that extreme fluctuations in numbers are unlikely from season to season.

Table 1. Population summary for *Pterostylis atriola*

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of plants
1	Mount Montgomery	Mount Montgomery State Reserve	Cradle Coast	Ulverstone	2009 (2004)	0.03 0.05	18 small colony
2	Railton	State forest	Cradle Coast	Railton	2008 (1990s)	0.11	82 counted
3	Ridge between Douglas River and Mayson River	Douglas-Apsley National Park	North	St John	1993	0.05	small colony
4	Thompsons Marshes	Douglas-Apsley National Park	North	Gray	1992	0.05	small colony
5	Holwell Gorge	Holwell Gorge State Reserve	North	Beaconsfield	1997	0.05	small colony
6	Golconda	Unknown	North	Nabowla	1997	0.25	small colony
7	Wyniford River	State forest	North	Lanka	2001	0.005	3
8	Lanka Road	State forest	North	Lanka	2008	0.0001	1
9[1]	Williams Hill near Pearly Brook	State forest	North	Pearly Brook	2006	unknown	unknown
10	Snug Tiers	Snug Tiers Nature Recreation Area	South	Huonville	2009 2006 (1997)	10+ 2 5	1000+ 47 80-100
11	Blowhole Valley on South Coast walking track	Southwest National Park	South	Recherche	1992	0.001	3 (not seen since despite searches)
12	Wielangta Hill	State forest	South	Sandspit	2008	2 sites (300 m apart)	unknown
13	Back Run Hills	State forest	South	Kellevie	2006 (2002)	2 sites 7 sites over 53 ha	21 52
14a	Bluff River near Tin Pot Creek	State forest (Buckland Military Training Area)	South	Woodsdale	2009	unknown	42
14b	Bluff River near Sugarloaf Creek	State forest	South	Ravensdale	2009	unknown	10
15[2]	Lake Leake area	Wye River State Reserve	South	Leake	2008 (2006)	c. 1 ha	20-30

[1]This site is reported in the April/May 2006 newsletter of the Launceston Field Naturalists Club, in the article "Federation Weekend 24-26 March"; [2]Malcolm Wells, pers. comm. 2010;
NRM=Natural Resource Management region

RESERVATION STATUS

Pterostylis atriola is reserved in the Snug Tiers Nature Recreation Area, Holwell Gorge State Reserve, Southwest National Park, Douglas-Apsley National Park Mount Montgomery State Reserve and Wye River State Reserve.

CONSERVATION STATUS

Pterostylis atriola was listed in 2001 as endangered on the Tasmanian *Threatened Species Protection Act 1995*, at a time when its distribution was poorly understood and it was known from a small number of sites. The species was downlisted to rare in 2011 meeting criterion B 'the total population consists of fewer than 10,000 mature individuals and no more than 2,500 mature individuals occur on land that is in an area free from sudden processes capable of causing largely irreversible loss of individuals or habitat'.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

The development of appropriate management strategies for subpopulations of *Pterostylis atriola*

is limited by imprecise knowledge of the extent of subpopulations and the response of the species to disturbance.

Forestry activities: Parts of the species' range are subject to intensive forestry activities. The species generally occurs in dry eucalypt forests with relatively stony soils. Such sites are not generally considered suitable for clearfelling and conversion to monoculture plantation but are subject to selective logging and more intensive logging (such as clearfelling followed by high intensity regeneration burning). The specific effect of such activities on the species is not known, although it is highly unlikely the species would persist within monoculture plantations. The species can persist and may even have benefited from other forestry activities because it occurs along forestry roads and within areas subject to light selective logging and older clearfell logging operations. Policy mechanisms ensure that known subpopulations of threatened flora are managed in wood production forests (Forest Practices Board 2000) and some subpopulations on State forest are now located in informal reserves (Orr & Gerrand 1998).

Road and track maintenance: Three subpopulations occur near forestry roads (e.g. Wielangta and Railton areas) or popular 4WD tracks (e.g. Snug Tiers area) and other subpopulations occur adjacent to popular walking tracks (e.g. South Coast track, Douglas-Apsley National Park). Low intensity (e.g. slashing) and periodic road or track maintenance may not be detrimental, especially if undertaken during the non-fertile period of the species' life history. However, more intensive upgrading of roads or tracks supporting the species (e.g. widening or sealing activities) could be more detrimental, at least at a local scale.

Inappropriate disturbance regime: The flowering of most species of *Pterostylis* is linked to some form of disturbance (Jones et al. 1999). *Pterostylis atriola* appears to respond positively to mechanical disturbance of the soil as it occurs along forestry roads in the Wielangta area, on the edges of 4WD tracks in the Snug Tiers area, and on the edge of a walking track in the south. It is present in areas that have been subject to forestry activities including clearfelling followed by high intensity regeneration fires in the Wielangta area. Current information indicates that subpopulations of the species may be under threat from lack of disturbance.

Dam construction: The subpopulations at the Wyniford River and along Lanka Road are within areas proposed for large irrigation dams.

Stochastic risk: Due to the widespread distribution of the species, with several subpopulations extending over 10s of hectares, the risk of stochastic extinction is low at a Statewide level, but may be higher at the level of subpopulation, especially those with apparent low numbers of individuals.

Management Strategy

What has been done?

- *Pterostylis atriola* was included in the *Flora Recovery Plan: Tasmanian Threatened Orchids 2006–2010* (TSU 2006).
- A proposed forestry coupe on State forest in the Railton area was subject to a formal survey for the presence of *Pterostylis atriola* (ECO*tas* 2007) and long-term monitoring plots were established to monitor the response of the species to selective harvesting (ECO*tas* 2008).

Management objectives

The main objectives for the management of *Pterostylis atriola* are to maintain the viability of the existing subpopulations, and to promote conditions for its successful recruitment.

What is needed?

- determine the full extent and condition of known subpopulations to inform the development of an appropriate management strategy for each site;
- undertake demographic monitoring of the species at selected subpopulations, especially before and after burns and other disturbance events;
- continue monitoring the response of the species to a selective harvesting event in the State forest coupe near Railton;

- support the Private Land Conservation Program (DPIPWE) with the establishment of conservation covenants for private land supporting *Pterostylis atriola*, and ensure that current priorities for the species are incorporated into the program's reservation strategies;
- 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;
- implement the threatened orchid recovery plan (TSU 2006) and include the species in any revision of the plan.

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View:
www.dpipwe.tas.gov.au/threatenedspecieslists

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