Image by Mark Wapstra

Prasophyllum stellatum

ben lomond leek-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name:	***Prasophyllum stellatum*** D.L.Jones, *Austral. Orchid Res.* 3: 115 (1998)
Common name:	ben lomond leek-orchid (Wapstra et al. 2005)
Group:	vascular plant, dicotyledon, family **Orchidaceae**
Status:	*Threatened Species Protection Act 1995*: **endangered** *Environment Protection and Biodiversity Conservation Act 1999*: **Critically Endangered**
Distribution:	Endemic status: **Endemic to Tasmania** Tasmanian NRM Region: **North**

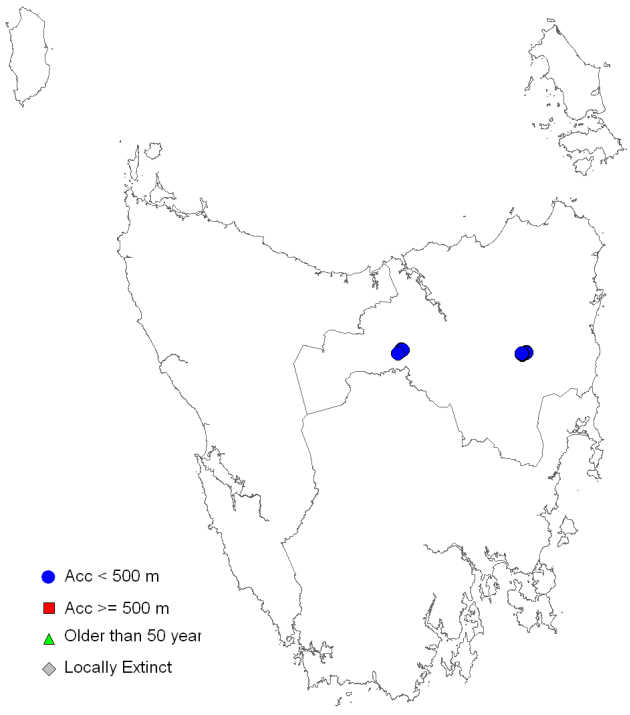

Figure 1. The distribution of *Prasophyllum stellatum*

Plate 1. *Prasophyllum stellatum* from the Storys Creek type location (image by Mark Wapstra)

IDENTIFICATION AND ECOLOGY

Prasophyllum species, commonly known as leek-orchids, are deciduous terrestrials with small, fleshy, round or oval tubers and a few fleshy, irregular roots. Most species are dormant over summer and autumn and begin growth in early winter. The single, erect, hollow leaf is reddish at the base as opposed to green as in onion-orchids (*Microtis*). The flower spike emerges through the side of the leaf above the middle, with the portion of leaf above the point of emergence being free and often withered by the time the flowers open. The flower spike bears many flowers that are held upside-down and are often fragrant. The labellum, often with prominent wavy or frilly margins, produces nectar on which a wide range of insects feed. Some of these, particularly native bees, wasps and beetles, are effective pollinators.

Most species of *Prasophyllum* respond vigorously to high intensity fires during the preceding summer (Jones et al. 1999). However, Wapstra et al. (2011) indicated that no sites supporting *Prasophyllum stellatum* showed signs of recent fire events of any form i.e. wildfire, forestry regeneration burns or managed fuel reduction burns. Ziegeler (1997) noted that the species occurs in montane forest that is subject to longer intervals between fires than lowland dry sclerophyll forest. It is estimated that the sites where *Prasophyllum stellatum* has been detected have not been subject to fire for at least three decades. It is likely that the species can persist in the absence of fire but that some form of canopy and understorey disturbance is desirable because it is sparse in the shrubbier parts of the forest (Wapstra et al. 2011).

Survey techniques

Prasophyllum stellatum can only be identified with flowers present. Evidence suggests the species flowers from late summer to early autumn. Most specimens were collected in mid to late February from the Storys Creek area (Wapstra et al. 2008) and mid to late January from the Cluan Tiers area (Wapstra et al. 2011), though the latter noted flowering was not well synchronised, with plants exhibiting different stages of maturity (buds, open flowers, withered fertilised flowers) when seen. The species may not flower or emerge in dry years.

Description

The following description for the published concept of *Prasophyllum stellatum* is adapted from Jones (1998), Jones et al. (1999) and Jones (2006). However, recent field studies (Wapstra et al. 2011) suggest greater variation in several characters than in the description below.

Prasophyllum stellatum has a leaf that is erect, terete, and 30 to 70 cm long and 7 to 10 mm wide. The base of the leaf is dark red to purple and the upper part dark green. The free part of the leaf blade is erect to suberect, about 8 to 15 cm long and often withered at flowering. The inflorescence is 40 to 80 cm tall, the spike 9 to 15 cm long. The spike is fairly open with 10 to 20 flowers, 15 to 20 mm long and 14 to 18 mm wide. The ovary is green, projecting, oblong-obovoid, 8 to 10 mm long and 2.5 to 3.5 mm wide. The flowers are greenish brown to brownish with a white labellum. The flowers are subsessile, open widely and not noticeably fragrant. The dorsal sepal is narrowly ovate-lanceolate, 9 to 11 mm long and 3 to 4 mm wide, with 3 to 5 dark brown striae prominent. The lateral sepals are linear-lanceolate, free and very widely divergent, erect, and 10 to 12 mm long and 2.4 mm wide. The petals are narrowly linear, 11 to 12 mm long and 1.5 mm wide, with a brown median band, and are widely divergent. The labellum is narrowly elliptical-oblong, 12 to 14 mm long and 5 to 5.5 mm wide, sharply recurved back on itself near the middle, the distal half nearly parallel to the basal portion and the apex recurved and touching the base. The margins of the labellum are irregularly crinkled. The labellum callus is greenish yellow and fleshy, projecting just beyond the bend in the labellum. The apex of the labellum is notched, and papillate. The column is 4 mm long and 3.3 mm wide, the appendages longer than the anther.

Confusing species and taxonomic issues

Prasophyllum stellatum is a new species in the *Prasophyllum patens/truncatum* complex (Jones et al. 1999), distinguished by moderately large

flowers with widely spreading perianth segments and a long relatively narrow labellum (Jones 1998). It is most similar to *Prasophyllum robustum*, but that species has a lowland distribution (less than 300 m elevation), is earlier flowering (November to December), has an ovate-lanceolate labellum with the distal half obliquely erect, the tip protruding through the lateral sepals, an ovate-oblong labellum callus that extends to the bend in the lamina, and a column with the anther of similar width to the stigmatic plate (Jones 1998).

Prasophyllum stellatum was described using specimens from the Storys Creek area and is currently circumscribed as a tall, large-flowered species (Jones 1998). However, Wapstra et al. (2011) demonstrated considerable variation in a number of characters meaning that several specimens from this area were not good matches for the type diagnosis. This may have been due to previous collectors selecting the 'best' (i.e. typically the biggest) specimens to send to experts for confirmation and these were used to diagnose the species. Several *Prasophyllum* specimens collected by Wapstra et al. (1999) from the Storys Creek area, representing the range of elevations and microhabitats in the area, have been confirmed as *Prasophyllum stellatum*.

An early collection from the Cluan Tiers area had tentatively been assigned to *Prasophyllum stellatum*. Specimens collected by Wapstra et al. (2011) from virtually the precise same site were initially identified as *Prasophyllum truncatum* by specialists though closer examination suggested that the material is not a good match for the Tasmanian concept of *Prasophyllum truncatum* (Jones et al. 1999), which is generally regarded as a lowland species. Wapstra et al. (2011) reported significant difficulties in differentiating *Prasophyllum* material from Storys Creek and Cluan Tiers. Both entities occupied very similar habitats and have similar growth habits. Characters traditionally used to separate species of *Prasophyllum* (e.g. density of flowers in the inflorescence, length and shape of perianth segments, degree to which the labellum is reflexed, presence of papillosities on the labellum, etc.) were highly variable, including those from plants collected only metres apart.

For management purposes, Wapstra et al. (2011) suggested a conservative approach (adopted here), with all the Cluan Tiers and Storys Creek *Prasophyllum* material classified as *Prasophyllum stellatum.* They suggest that the concept of *Prasophyllum stellatum* needs to be broadened to capture the now recognised variation noted from both Storys Creek and Cluan Tiers. Confusion with other species in the complex (e.g. *Prasophyllum incurvum*, *Prasophyllum truncatum*, *Prasophyllum robustum*) is likely to remain until the taxonomy of the *Prasophyllum truncatum* species-complex in Tasmania is reviewed. As such, the identification of *Prasophyllum stellatum* currently requires the use of a combination of characters, as well as site features and distribution.

DISTRIBUTION AND HABITAT

Prasophyllum stellatum is endemic to Tasmania. It has a disjunct distribution, occurring in the Storys Creek area, on the southern slopes of Ben Lomond, and at Cluan Tiers, south of Deloraine (Table 1, Figure 1). The species has an estimated extent of occurrence of 180 km^2 and area of occupancy of 94 ha (Table1).

Sites supporting *Prasophyllum stellatum* vary in elevation from 790 to 960 m a.s.l. at Storys Creek and 555 to 695 m a.s.l. at Cluan Tiers, and all occur on Jurassic dolerite. Supporting vegetation is forest dominated by *Eucalyptus delegatensis* (with *Eucalyptus dalrympleana* as a minor canopy component) with a shrubby to grassy understorey. Most sites have a relatively high surface rock cover with deep clay-loam soils (Plate 2; Wapstra et al. 2011).

At both locations, *Prasophyllum stellatum* was recorded from various forest successional stages ranging from relatively mature and undisturbed forest with few signs of forest harvesting activities and infrequent fire events to recently harvested forest (Plates 2 to 4). Many sites were located on old snig tracks (detectable as grassed over rutted trails through the forest), old landing sites and the immediate verges of well-formed forestry roads (including from soft roadside gravels pushed up from grading and on less disturbed batters) (Wapstra et al. 2011).

Table 1. Population summary for *Prasophyllum stellatum*

	Location	Tenure	NRM region *	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of mature plants
1	Storys Creek	State forest and private property	North	Stacks Mangana	2008 (1985)	c. 64	46
2	Cluan Tiers	State forest	North	Cluan	2008 (1990s)	c. 30	32

* NRM region = Natural Resource Management region



Plate 2. (LHS) Habitat of *Prasophyllum stellatum* at Storys Creek – undisturbed site (image by Mark Wapstra)
Plate 3. (middle) Habitat of *Prasophyllum stellatum* at Storys Creek – snig track amongst selectively logged forest (image by Mark Wapstra)
Plate 4. (RHS) Habitat of *Prasophyllum stellatum* at Storys Creek – poor regeneration on 1970s log landing site (image by Mark Wapstra)

POPULATION ESTIMATE

Prasophyllum stellatum is known from 2 locations (Table 1). It tends to occur in relatively low numbers at any particular site, often occurring singly or as less than 5 individuals spread over a radius of about 50 m. Wapstra et al. (2011) detected 46 individuals from 38 sites at Storys Creek and 32 individuals from 13 sites at Cluan Tiers.

On present evidence, it is estimated *Prasophyllum stellatum* is represented by between 50 to 250 mature individuals in total. However, it is likely that the number of individuals present at any particular site will vary from year to year due to variation in climate or time from disturbance. In the Storys Creek area, subjective observations suggest some fluctuations in numbers, which may be related to the stage of forest succession following the disturbance by selective logging in the mid 1970s.

In the Storys Creek area, *Prasophyllum stellatum* occurs in three patches of forest extending across 214 ha. The western patch was found to extend over 33 ha, the central patch over 4.5 ha and the eastern patch over 26 ha (Wapstra et al. 2011). On the Cluan Tiers, *Prasophyllum stellatum* was detected from several sites, extending across 110 ha. At a finer scale, the extent is significantly less, occurring over 30 ha if the westerly outlying sites are ignored (Wapstra et al. 2011).

Based on the similarity of vegetation, topography and geology, it is expected that *Prasophyllum stellatum* would be more widespread at each of the 2 known locations. Limited additional areas were surveyed about 1 to 3 km northeast of the most easterly mapped site at Storys Creek without success. A recent survey of superficially suitable habitat about 3 km southeast of the most westerly mapped site also failed to detect the species (A. Pennington,

pers. comm.). The notebooks and annotated maps of Ron Williamson indicated that he detected several additional sites supporting *Prasophyllum* to the south at Cluans Tier in the 1990s.

RESERVATION STATUS

Prasophyllum stellatum is unreserved, occurring mainly on State forest and a small parcel of private property (Table 1).

CONSERVATION STATUS

Prasophyllum stellatum was listed as endangered on the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being, meeting criterion D (population estimated to number fewer than 250 mature individuals).

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

The principal threat to *Prasophyllum stellatum* is inappropriate disturbance. Historically, known sites have been disturbed by wildfires and/or modified by selective logging activities.

Forestry practices: All known sites are potentially subject to forestry activities though the forest type (grassy to shrubby *Eucalyptus delegatensis* forest) and site conditions are not suitable for the establishment of plantations. Wapstra et al. (2011) concluded selective harvesting that minimises disturbance to identified key sites and maintains some canopy and understory structure, may be appropriate to maintain, and perhaps enhance, the habitat of *Prasophyllum stellatum*. They suggested that the actual and potential presence of *Prasophyllum stellatum* in areas of wood production forest in the wider Storys Creek and Cluan Tiers areas should continue to be considered in land management planning on both public and private land, though, due to the widespread distribution of potential habitat, limited to known sites and a 10 km buffer.

Inappropriate disturbance regime: Flowering of most *Prasophyllum* species is linked to disturbance (Jones et al. 1999). Wapstra et al. (2011) suggested that *Prasophyllum stellatum* responds positively to disturbance, including ground and canopy disturbance caused by forestry activities, and that long-term absence of disturbance or firing may detrimentally affect the species where a dense shrubby understorey can develop and shade out plants. Wapstra et al. (2011) estimated that sites supporting the species had not been burnt for at least 3 decades suggesting that frequent firing and intense burns may not benefit the species. Ziegeler (1997) suggested that "a fire free interval of 50 years or more might be appropriate". While Ziegeler (1997) listed grazing practices as a possible concern, recent observations (Wapstra et al. 2011) suggest that stock grazing is highly unlikely to occur at the locations supporting the species.

Climate change: Changes in the rainfall pattern may lead to the habitat becoming unsuitable for the species and associated pollinators and mycorrhizal fungi. A trend towards a warmer climate may increase the frequency and intensity of wildfires, which may affect the suitability of habitat.

Stochastic risk: The low number of plants and localised distribution of *Prasophyllum stellatum* exposes the species to losses from chance events. This is exacerbated by its ephemeral nature and sparse occurrence in relatively large areas of suitable habitat, these factors limiting the chances of detecting the presence of the species even when conducting targeted surveys.

MANAGEMENT STRATEGY

What has been done?

Recovery planning: *Prasophyllum stellatum* was included in the *Flora Recovery Plan: Tasmanian Threatened Orchids 2006–2010* (TSU 2006) with priority noted for surveys and negotiation with land managers.

Targeted surveys & monitoring: Ziegeler (1997) undertook surveys for *Prasophyllum stellatum* in the Storys Creek area. Officers of the Private Forests Reserves Program undertook additional surveys of both private property and State forest in the Storys Creek area in 2004. Formal surveys of two proposed State forest coupes in the area were undertaken in 2006 (Wapstra 2006 a,b). Wapstra et al. (2011) examined the distribution, habitat characteristics and conservation status of the

species, undertaking surveys at both Storys Creek and Cluan Tiers.

Management planning: A Special Management Zone under Forestry Tasmania's Management Decision Classification planning system (Orr & Gerrand 1998) has been established in the Storys Creek area.

Management objectives

- prevent the loss or degradation of known sites;
- identify new sites and locations for the species;
- promote site conditions suitable for successful recruitment and persistence;
- improve the reservation (or management zoning) status of the species.

What is needed?

- include the Cluan Tiers sites and an appropriate buffer in a Special Management Zone under Forestry Tasmania's Management Decision Classification planning system (Orr & Gerrand 1998), and update the Special Management Zone already established in the Storys Creek area;
- undertake extension surveys;
- monitor sites for disturbance levels and threats to determine management needs;
- undertake demographic monitoring to determine the response of the species to disturbance and climatic conditions;
- conduct ecological burns in known or potential habitat that has not been burnt or suitably disturbed in 50 years;
- undertake taxonomic research into the *Prasophyllum truncatum* complex in Tasmania to clarify the status of *Prasophyllum stellatum*;
- collect seed for long-term conservation storage at the Tasmanian Seed Conservation Centre;
- support the Private Land Conservation Program (DPIPWE) with the establishment of conservation covenants for private land supporting *Prasophyllum stellatum*, and ensure that current priorities for the species are incorporated into the program's reservation strategies;
- provide information and extension support to the relevant Natural Resource Management committees, local councils, government agencies and the local community 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:
http://www.dpiw.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species Section, Department of Primary Industries, Parks, Water and Environment, GPO Box 44, Hobart, Tasmania, Australia, 7001. Ph (03) 6233 6556; fax (03) 6233 3477.

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