Prasophyllum crebriflorum

crowded leek-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Hans & Annie Wapstra

Scientific name: ***Prasophyllum crebriflorum*** D.L.Jones, *Muelleria* 18: 103 (2003)
Common Name: crowded leek-orchid (Wapstra *et al.* 2005)
Group: vascular plant, monocotyledon, family **Orchidaceae**

Status: *Threatened Species Protection Act 1995*: **endangered**
Environment Protection and Biodiversity Conservation Act 1999: **Endangered**

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

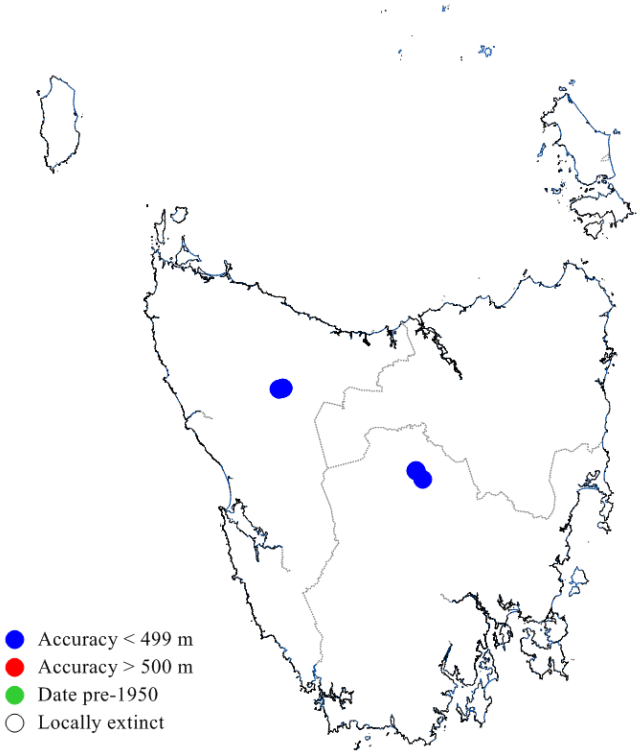

Figure 1. The distribution of *Prasophyllum crebriflorum*

Plate 1. *Prasophyllum crebriflorum* (Image by Hans & Annie Wapstra)

IDENTIFICATION AND ECOLOGY

Species of *Prasophyllum* are commonly known as leek-orchids because the erect hollow leaf has some resemblance to that of a leek. *Prasophyllum* species 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 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 quantities of nectar on which a wide range of insects feed. Some of these, particularly native bees, wasps and beetles, are effective pollinators.

The flowering of many leek-orchids is strongly dependent on hot summer fires, with large numbers of flowering plants often being produced a year later but few or none in subsequent years. For similar reasons some species may be prominent in disturbed sites such as slashed areas, or along track verges and road embankments (Jones *et al.* 1999).

The flowering of *Prasophyllum crebriflorum* is enhanced by fire because in the Surrey Hills area it has only been detected in the seasons after ecological burning of the highland native grasslands. Long period without fire can create rank stands of *Poa labillardierei* without inter-tussock spaces suitable for herbs to germinate (Plate 2).

Prasophyllum crebriflorum flowers from early to mid December through to January, with most flowers fertilised by mid January (Wapstra *et al.* 2008). The flowering season is likely to be relatively short in the high altitude native grasslands subject to cold weather conditions.

Description

Prasophyllum crebriflorum has a leaf that is erect, terete, and 12 to 26 cm long and 2 to 5 mm wide. The base of the leaf is reddish to purple and the upper part dark green. The free part of the leaf blade is suberect, about 6 to 10 cm long and usually withered at flowering. The inflorescence is 25 to 35 cm tall, the spike 6 to 20 cm long. The spike is moderately dense to dense (Latin *creber*, dense or crowded) with 6 to 25 flowers. The flowers are reddish brown and lightly scented and are 12 to 15 mm long and 10 to 12 mm wide. They open very widely and are sessile. The dorsal sepal is 6.5 to 8 mm long and 2.5 to 3 mm wide. The lateral sepals are free and nearly parallel, 6.5 to 8 mm long and 1.8 to 2.2 mm wide. The petals are 5.5 to 7 mm long and 0.8 to 1.2 mm wide, upswept and widely spreading. The labellum is sharply recurved near the middle, and 5 to 6 mm long and 3 to 3.5 mm wide. The labellum is broad at the base and then tapered with irregular margins. The callus of the labellum is smooth and extends nearly to the apex.

[description from Jones 2003, Jones 2006]

Plate 2. *Prasophyllum crebriflorum* growing in inter-tussock spaces on Westwing Plain
(Image by Matthew Larcombe)

Confusing Species

Prasophyllum crebriflorum is loosely allied to the *Prasophyllum correctum* species-group (Jones 2003). *Prasophyllum crebriflorum* is recognised by its crowded, widely opening, reddish-brown flowers, the labellum recurved just above the middle, the apical tail-like part of the labellum comprising about one-third of the length of the labellum and the labellum callus being smooth. Within Tasmania, *Prasophyllum crebriflorum* is most similar to *Prasophyllum incorrectum* but that is a species of lowland grassland habitats (Jones 2003). *Prasophyllum crebriflorum* may co-occur

with other montane leek-orchids such as *Prasophyllum mimulum*, *Prasophyllum alpinum, Prasophyllum* aff. *montanum* and *Prasophyllum sphacelatum*, so care should be taken with identification, although confusion with some of these species is unlikely.

DISTRIBUTION AND HABITAT

Prasophyllum crebriflorum is known from 2 native grasslands in the Surrey Hills area in northwestern Tasmania, and from 2 native grasslands and grassy woodlands on the southern part of the Central Plateau (Table 1, Figure 1).

In northwestern Tasmania, *Prasophyllum crebriflorum* occurs in montane tussock grassland dominated by *Poa labillardierei*, with scattered patches of the woody shrub *Hakea microcarpa* (Plate 3). Some individuals grow in fairly dense patches of *Poa labillardierei* tussocks but most occur in naturally open areas of more bare ground with herbs such as *Herpolirion novae-zelandiae* and *Trachymene humilis* (Jones 2003). The species grows in brown clay loams derived from Tertiary basalts at altitudes of 660–670 m elevation, with an annual rainfall greater than 2000 mm (Jones 2003, Craven 1998).

On the Central Plateau, *Prasophyllum crebriflorum* occurs in native grassland dominated by *Poa gunnii* and in grassy woodland with a sparse overstorey of *Eucalyptus gunnii*. The Central Highlands subpopulations occur on soils derived from Jurassic dolerite, at altitudes of 900-1050 m elevation.

Plate 3. Habitat of *Prasophyllum crebriflorum* at Westwing Plain (Image by Matthew Larcombe)

Table 1. Population summary for *Prasophyllum crebriflorum.*

	Subpopulation	Tenure	NRM Region *	1:25000 Mapsheet	Year seen	Area occupied	Number of mature plants
1	Westwing Plain near Moory Road	Private property	Cradle Coast	Pearse	2000 (Dec) 2007 (Dec) 2009 (Jan)	0.5 ha (100 x 50 m) 0.09 ha (30 x 30 m) 0.4 ha (80 x 60 m)	c. 75 1 c. 50
2a	Racecourse Plain near Moory Road (site 1)	Private property	Cradle Coast	Pearse	2000 (Dec)	0.0001 ha	1
2b	Racecourse Plain near Moory Road (site 2)	Private property	Cradle Coast	Pearse	2001 (Jan) 2007 (Dec)	0.16 ha (80 x 20 m) 6 ha (200 x 300 m)	c. 50-60 2
3	Barren Plains near Shannon Lagoon	Private property	South	Miena	2002 (Jan) 2009 (Jan)	Unknown 0.0001 ha	c. 15 1
4	St Patricks Plains north of Wihareja Lagoon	Private property	South	Wihareja	2009 (Jan)	c. 1-2 ha	c. 150-300

*NRM region = Natural Resource Management region.

POPULATION ESTIMATE

In the Surrey Hills area *Prasophyllum crebriflorum* is known from 2 locations, about 2.5 km apart (Table 1). The total population at these sites was estimated at less than 250 mature individuals in the 2000/2001 flowering season but only about 50 individuals were observed in early 2009 (Larcombe 2009, unpublished), though it was noted many leaves could not be confidently identified because of co-occurring *Prasophyllum* species, but may well have been *Prasophyllum crebriflorum*. The main subpopulation on the Central Plateau supports 150-250 mature individuals in a localised area of a few hectares.

Montane grasslands in Tasmania have been subjected to increasing botanical interest over the past 25 years (e.g. Kirkpatrick & Duncan 1987), with a particular focus on private land in the species' first known stronghold at Surrey Hills (Gilfedder 1995, Craven 1998). Grasslands on land managed by Forestry Tasmania in adjacent areas have been subject to recent surveys (e.g. Craven *et al.* 2000, Johnson 2003). High elevation grasslands and grassy woodlands on State forest in the Borradaile-Olivers Plains area have also received attention (Craven *et al.* 2000). Targeted surveys for *Prasophyllum crebriflorum* were undertaken in the Surrey Hills grasslands in December 2000 and January 2001 by orchid specialists and additional sites for the species were not located.

The likelihood of additional subpopulations of *Prasophyllum crebriflorum* being discovered outside its currently known extent of occurrence is considered to be relatively low given the past survey efforts. However, the recent detection and recognition of the species on the Central Plateau, about 100 km southeast of the Surrey Hills location, suggests that additional discoveries may still be made in potential habitat. It should be noted that even if additional subpopulations were to be discovered, significant range extensions or increased population estimates (e.g. orders of magnitude) are not likely because of the relatively limited extent of the high elevation grassland habitat. Any such extension is highly unlikely to result in the species being downlisted into a lower threat category.

RESERVATION STATUS

The species is not formally reserved.

CONSERVATION ASSESSMENT

Prasophyllum crebriflorum was listed in 2008 as endangered on schedules of the Tasmanian *Threatened Species Protection Act 1995* at the time of listing meeting criterion D because there were fewer than 250 mature individuals and the species was known from fewer than 5 locations occupying less than 1 hectare in total.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Prasophyllum crebriflorum shares the attributes of a number of other Tasmanian leek-orchids associated with native grasslands that are currently listed on the Tasmanian *Threatened Species Protection Act 1995*, including *Prasophyllum incorrectum*, *Prasophyllum olidum*, *Prasophyllum taphanyx* and *Prasophyllum tunbridgense* (Jones *et al.* 1999, Jones 2003, Jones 2004). Each of these species is confined to highly localised sites (and usually very low population numbers) among larger seemingly similar habitats or with seemingly similar sites available in the wider area. The general impression is one where it may be assumed that their distribution was always patchy, but the number of sites has been drastically reduced due to habitat loss and/or degradation (Jones *et al.* 1999).

The subpopulations of *Prasophyllum crebriflorum* in northwestern Tasmania occur within an informal private reserve, the species' montane grassland habitat being subject to a vegetation management plan (Craven 1998, Davey & Duncan 2006). Other subpopulations occur on unreserved private property. Montane grasslands fall within the TASVEG community 'Highland *Poa* grassland' (Harris & Kitchener 2005), a community now listed as threatened on Schedule 3 of the Tasmanian *Nature Conservation Act 2002*. The species' habitat is, therefore, protected from clearance and conversion under the provisions of the Tasmanian *Forest Practices*

Act 1985, though existing land management practices such as the burning regime noted above will not necessarily be restricted.

Major threats are detailed below:

Clearing of potential habitat: Considerable areas of potential habitat for *Prasophyllum crebriflorum* in Tasmania's montane grasslands are thought to have been lost through inappropriate land use since European settlement. Montane grasslands have been impacted upon by conversion to monoculture plantation since the 1950s, a process that continued to accelerate (Kirkpatrick & Duncan 1987) until the 1980s but has now almost ceased. Broadscale clearing of montane grassland is now prohibited by legislative and policy mechanisms, although localised clearing for smaller scale activities have the potential to deleteriously affect *Prasophyllum crebriflorum*.

Inappropriate disturbance (grazing) regime: Many montane grasslands have been used for stock grazing, with varying degrees of "pasture improvement" applied. At least some of the native grasslands in the key Surrey Hills area are known to have been aerially fertilised to improve grass quality (for cattle grazing) in the post-1950s period, and have also been subjected to regular spring burns at about a 2–3 year frequency (Craven 1998), primarily to improve the quality of the grasslands for cattle grazing. Such "improvement" of native pasture may have been detrimental to species such as *Prasophyllum crebriflorum* if the disturbance regime did not mimic natural disturbance events. Spring burning, for example, may have reduced opportunity for seed set, and fertilising may have altered soil conditions such that the delicate mycorrhizal fungal association was altered. Stock is no longer present on any of the native grasslands supporting *Prasophyllum crebriflorum* in the Surrey Hills area, but remain present in extensive parts of the Central Plateau, including at sites supporting *Prasophyllum crebriflorum*.

Inappropriate fire regime: Inappropriate fire frequencies are considered to be a threat to *Prasophyllum crebriflorum*. As herbs requiring light and some space, orchids may be shaded out in tussock grasslands that are allowed to grow rank without some form of disturbance. While leek-orchids do possess tubers, and might therefore be expected to persist in a dormant state during unfavourable conditions, the longer the period without flowering and fresh seed production, the less likely must be the long-term persistence of a species in an area (Jones *et al.* 1999). Conversely, the long-term impact of regular spring burning and stock grazing in many montane native grasslands during the latter half of the 20th century remains to be determined. It should be noted that the current land owner and manager of the Surrey Hills sites supporting *Prasophyllum crebriflorum* have been effectively implementing a management plan for the Surrey Hills grasslands, which includes carefully designed ecological burns (Davey & Duncan 2006).

Climate change: The potential impacts of climate change on montane grasslands is difficult to quantify but it is possible that even minor shifts in average seasonal conditions may have an adverse impact on locally restricted species such as *Prasophyllum crebriflorum*, especially if other ecological factors are absent (e.g. an appropriate fire regime) or other site factors change (e.g. grazing regime).

Stochastic events: While stochastic events are by definition unpredictable, in this case, such events are most likely to be associated with severe unmanaged fire events.

MANAGEMENT STRATEGY

What has been done?

Prasophyllum crebriflorum was discovered by chance on a field day on the management of montane grasslands, which followed a study partly sponsored by the land owner of the sites supporting the species. The company has been closely involved in the conservation management of its native grasslands over many years (e.g. Davey & Duncan 2006) and is undertaking active fire management for ecological reasons across its entire Surrey Hills estate (with appropriate permits). The discovery of *Prasophyllum crebriflorum* has been met with

interest by the company and it has supported additional surveys in several other areas of potential habitat on its estate.

In January 2009, staff of the Department of Primary Industries, Parks, Water and Environment, and local volunteer group 'Threatened Plants Tasmania' worked with the land-manger to establish a long term demographic monitoring site at Surrey Hills. This monitoring program is aimed at identifying factors important in the growth and decline of subpopulations.

Seed and mycorrhizal fungi were collected for long-term storage at the Tasmanian Conservation Seed Centre

Prasophyllum crebriflorum was not formally included in the *Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (TSU 2006), although the formal listing of the species brings the species under the terms of this plan.

Management objectives

The main objective for the management of *Prasophyllum crebriflorum* is to ensure that the known subpopulations remain viable through maintenance of the appropriate ecological conditions.

What is needed?

- implement the management plans for individual grasslands across the entire Surrey Hills estate (Craven 1998) with appropriate modifications to accomodate the needs of *Prasophyllum crebriflorum* (including periodic burning at the right time of year);
- include the needs of the species in any revision of the management plans for individual grasslands across the entire Surrey Hills estate;
- pursue longer term security and improved management of subpopulations through more formal conservation arrangements;
- continue to assess the 4 subpopulations during the peak flowering season and nearby similar habitat, especially after management burning has been undertaken;
- conduct further extension surveys of potential habitat on the Surrey Hills estate after management burns have been undertaken;
- conduct further extension surveys of potential habitat in the Central Highlands, focussing on areas where *Prasophyllum sphacelatum* has been recorded;
- provide information and extension support to 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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