

# *Prasophyllum limnetes*

marsh leek-orchid



Image by Peter Tonelli

TASMANIAN THREATENED SPECIES LISTING STATEMENT

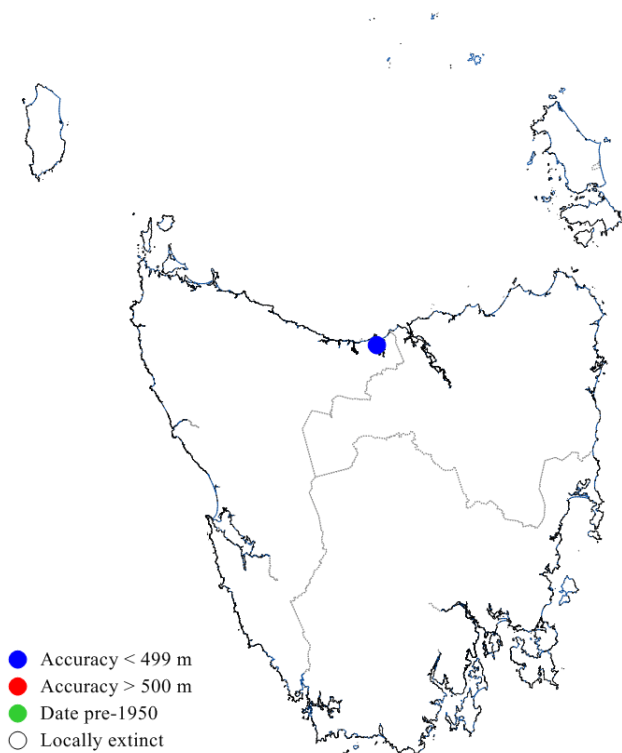
**Scientific name:** *Prasophyllum limnetes* D.L.Jones, *Australian Orchid Research* 5: 151 (2006)

**Common Name:** Marsh 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*: **Critically Endangered**

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



**Figure 1.** The confirmed distribution of *Prasophyllum limnetes*



**Plate 1.** *Prasophyllum limnetes*  
(Image by Peter Tonelli)

## 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). This is also likely to be the case for *Prasophyllum limnetes*, although the precise response of the species to disturbance is unknown due to lack of baseline data and long-term monitoring.

The species can only be identified from flowers. The type material was collected on 17 December but the species may flower slightly earlier so late November through December is the suggested survey period (Wapstra *et al.* 2008).

### Description

*Prasophyllum limnetes* has a leaf that is erect, terete, and 20 to 35 cm long and 4 to 6 mm wide. The base of the leaf is greenish to purplish and the upper part green. The free part of the leaf blade is suberect, about 10 to 15 cm long and usually partly withered at flowering. The inflorescence is 30 to 50 cm tall with the spike 8 to 12 cm long. The spike is crowded

with 15 to 35 flowers, 16 to 18 mm long and 6 to 8 mm wide. The flowers are greenish white with pink or mauve tones in the labellum. The flowers open widely and are not noted as being scented. The dorsal sepal is 7 to 9 mm long and 3 to 3.5 mm wide. The lateral sepals are free and nearly parallel, erect or recurved, and are 6 to 7.5 mm long and 2 to 2.3 mm wide. The petals are 6 to 7 mm long and 1 to 1.2 wide, and are projecting forward to incurved. The labellum is broadest near the base, then constricted, ending in a narrow tail. The margins of the labellum are irregular and the labellum callus extends nearly to the apex.

[description from Jones 2006, Jones & Rouse 2006]

### Confusing Species

*Prasophyllum limnetes* is allied to *Prasophyllum pyriforme* (Jones & Rouse 2006) and was previously included within the Tasmanian concept of that species (Jones *et al.* 1999). *Prasophyllum limnetes* is recognised by its basically greenish-white flowers with pink tones in the labellum with an obovate basal area that has broadly flared margins and is then strongly constricted just above the middle and with a distal, tapered tail-like apex, this region having a very narrow lamina that is not much wider than the fleshy callus, which extends close to the labellum apex (Jones & Rouse 2006).

There are several differences between *Prasophyllum limnetes* and *Prasophyllum pyriforme*, which are described in detail by Jones & Rouse (2006), but it is recommended that specialist opinion be sought on any collections suspected to be *Prasophyllum limnetes*.

### DISTRIBUTION AND HABITAT

*Prasophyllum limnetes* is known only from the type location within the Rubicon Sanctuary near Port Sorell (Table 1, Figure 1). It grows in an ecotone between low-lying marshy heath/sedgeland dominated by rushes and sedges with scattered patches of *Lomandra longifolia* and *Themeda triandra*, and coastal *Eucalyptus amygdalina* woodland with a heathy/grassy understorey (Plate 2).

**Table 1.** Population summary for *Prasophyllum limnetes*.

	Subpopulation	Tenure	NRM Region *	1:25000 Mapsheet	Year last seen	Area occupied (ha)	Number of mature plants
1	Rubicon Sanctuary near Port Sorell	Private property with conservation covenant	Cradle Coast	Port Sorell	1999 2007	0.0025 0.01	12 5

\*NRM region = Natural Resource Management region.

This habitat occurs at an altitude of 15 m a.s.l., with an annual rainfall around 800 mm (Jones & Rouse 2006). The soil, a heavy clay loam, is wet when the species is flowering but dries out during late summer (Jones & Rouse 2006).

The habitat is probably a result of slight variations in topography, drainage, and substrate. This is an unusual habitat that does not fit neatly into any TASVEG community (Harris & Kitchener 2005), and is considered to be rare in the near-coastal areas of northern Tasmania.



**Plate 2.** Habitat of *Prasophyllum limnetes* at the Rubicon Sanctuary (Image by Mark Wapstra)

#### POPULATION ESTIMATE

*Prasophyllum limnetes* is known from a single subpopulation of a few square metres and has been observed in 1999 and 2007, when 12 and 5 individuals, respectively, were observed. Prior to 1999, there is no data available on abundance though the species was known from the location (under the name of *Prasophyllum pyriforme*).

It is likely that the species does not emerge on an annual basis, responding only to events such as slashing and/or fire and it is unlikely to emerge in drought years. The broad vegetation type (i.e. lowland near-coastal heathy woodland on poorly drained terrain) supporting *Prasophyllum limnetes* is widespread in Tasmania and also well surveyed by orchid enthusiasts and botanists because of its tendency to support orchids and its floristic richness. Although *Prasophyllum limnetes* is recently described, there is only a low likelihood of the species having been overlooked in such surveys. Since 1975 *Prasophyllum limnetes* was attributed to *Prasophyllum pyriforme*, a species well known to local orchid enthusiasts. Therefore given the limited habitat in the Rubicon Sanctuary, the survey history under the name *Prasophyllum pyriforme*, the likelihood of specific habitat requirements, and the widespread clearing of near-coastal vegetation at potential sites, it seems unlikely that new subpopulations of *Prasophyllum limnetes* will be discovered outside its current range. It is noted, however, that there are no herbarium collections of the species from other sites in Tasmania, lending weight to the argument that the species was perhaps always very restricted. However, it seems unlikely that subpopulations of *Prasophyllum limnetes* large enough to influence its conservation status will be discovered in the future.

It is noted that the *Natural Values Atlas* database presently lists a record tentatively identified as *Prasophyllum limnetes* from Hunter Island but the identification requires confirmation as only photographic material is available.



## RESERVATION STATUS

*Prasophyllum limnetes* occurs wholly within a private land reserve known as the Rubicon Sanctuary and covenanted under the *Nature Conservation Act 2002*.

## CONSERVATION ASSESSMENT

*Prasophyllum limnetes* was listed in 2008 as endangered on schedules of the *Tasmanian Threatened Species Protection Act 1995*, meeting criterion D because there are fewer than 250 mature individuals and its area of occupancy is very restricted (it occupies less than 1 hectare, and it occurs in only 1 subpopulation).

## THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

*Prasophyllum limnetes* occurs as a highly localised subpopulation on private property managed as a reserve under the *Nature Conservation Act 2002*. Because of its localised distribution, stochastic events can lead to extinction. In addition, the small population size may lead to inbreeding problems possibly in combination with insufficient maintenance of subpopulations of pollinating insects and associated mycorrhizal fungi.

The observation that, unlike other orchids at the site, no seed was set in the 5 plants that flowered in 2007 may indicate that the subpopulation is now too small to attract pollinators or that the small subpopulation size has led to incompatibility problems through insufficient genetic variation.

### Land clearing and habitat fragmentation:

The 19 ha Rubicon Sanctuary that supports *Prasophyllum limnetes* is an “island” of remnant vegetation surrounded by improved pasture (ploughed, fertilised and sown with exotic pasture species) or housing estates. Clearing since European settlement is likely to have led to loss of unknown subpopulations and suitable habitat for the species to recruit into. The fragmentation of habitat is likely to have augmented the decline of unknown uncleared subpopulations through weed invasion, alteration of drainage and reduction of the

viability of pollinators and associated mycorrhizal fungi.

### Inappropriate burning and slashing regime:

Long periods without disturbance may lead to prolonged dormancy with increased risk of mortality through depletion of stores in underground tubers. Conversely, burning too frequently (e.g. annually) can adversely affect mycorrhizal fungi communities, rendering the site unsuitable for the fungal-dependent orchid species. Slashing or burning at the wrong time of year can damage plants and prevent seed from being produced and while the subpopulation may be able to sustain such damage on occasion, it may not be able to do so if the damage is regular or in combination with other threats such as prolonged drought.

Ploughing and fertiliser application is likely to have killed unknown subpopulations directly or indirectly by impacting on associated mycorrhizal fungi. Long periods without disturbance may have led to decline through the atrophy of underground tubers.

The property supporting *Prasophyllum limnetes* had a long history of slashing and periodic burning prior to being sold in 2003. The species did not emerge in 2005 and 2006 possibly due to lack of disturbance and/or drought.

While the habitat supporting *Prasophyllum limnetes* is not presently in decline, regular disturbance from fire and/or slashing is required to prevent future decline of the quality of the species’ habitat (through understorey growth). Following a prescribed autumn burn and slashing undertaken by the present owners under the conditions of the conservation covenant, 5 plants were observed to emerge and flower in 2007, some in the burnt area and some in the adjacent slashed area.

The management plan associated with the conservation covenant on the property advocates regular slashing and ecological burning to maintain and improve the natural values of the Rubicon Sanctuary (which includes several other threatened flora and fauna species, and vegetation types with a high

priority for conservation management). Risks include not firing at the most appropriate time of year to maintain orchid diversity. Hot summer fires are generally most favourable to maintain orchid diversity, though are usually suppressed due to safety concerns. Repeated spring or autumn burning may lead to the decline of the subpopulation in the long term.

**Climate change:** Changes in the rainfall pattern may lead to the habitat becoming unsuitable for the species and associated pollinators and mycorrhizal fungi.

**Weeds and disease:** Threats to the subpopulation of *Prasophyllum limnetes* from the introduction and spread of weeds and disease are not high and are addressed by the management plan associated with the conservation covenant on the Rubicon Sanctuary.

**Stochastic events:** While stochastic events are by definition unpredictable, in this case, such events are most likely to be associated with events such as unintended fires (e.g. arson, lightning strikes), although some such events are not necessarily likely to be deleterious, depending on their intensity, duration and timing.

## MANAGEMENT STRATEGY

### What has been done?

The private property supporting *Prasophyllum limnetes* has a conservation covenant and associated management plan under the *Nature Conservation Act 2002*. The management plan addresses the key ecological requirements of *Prasophyllum limnetes*, namely disturbance such as fire and slashing.

*Prasophyllum limnetes* was not formally included in the *Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (TSU 2006), although the plan did identify the Rubicon Sanctuary subpopulation of *Prasophyllum pyriforme* (now considered to be *Prasophyllum limnetes*) to be a priority population for recovery actions including monitoring. The current owners commenced annual monitoring of the orchids

on the land in 2007 with support from orchid enthusiasts and the Department of Primary Industries, Parks, Water and Environment (DPIPWE). The area had been subject to slashing and burning in the previous autumn. The species did not emerge in the previous 2 years probably due to lack of fire and/or slashing and drought (DPIPWE data).

### Management objectives

The main objective for the management of *Prasophyllum limnetes* is to ensure that there is no decline in the only known subpopulation.

### What is needed?

- provide an appropriate disturbance regime to maintain the Rubicon Sanctuary subpopulation and provide recruitment opportunities at the site;
- conduct demographic monitoring of the subpopulation during the flowering period to inform future management by determining the impact of slashing versus fire and optimum disturbance intervals and timing;
- conduct extension surveys of potential habitat (albeit recognising the severe limitations on habitat availability), including assessing the potential of the species to occur on Hunter Island;
- collect seed for long-term storage at the Tasmanian Seed Conservation Centre, contingent on sufficient fertile material being available;
- manually pollinate flowers to enable seed set to encourage recruitment from seed. (temporary caging of plants may be necessary to protect them from browsing);
- supplement the subpopulation *in situ* and/or *ex situ* with seedlings grown from stored plants;
- 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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