Prasophyllum atratum

three hummock leek-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Matthew Larcombe

Scientific name: ***Prasophyllum atratum*** D.L.Jones, *Australian Orchid Research* 5: 144 (2006)

Common Name: three hummock 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**

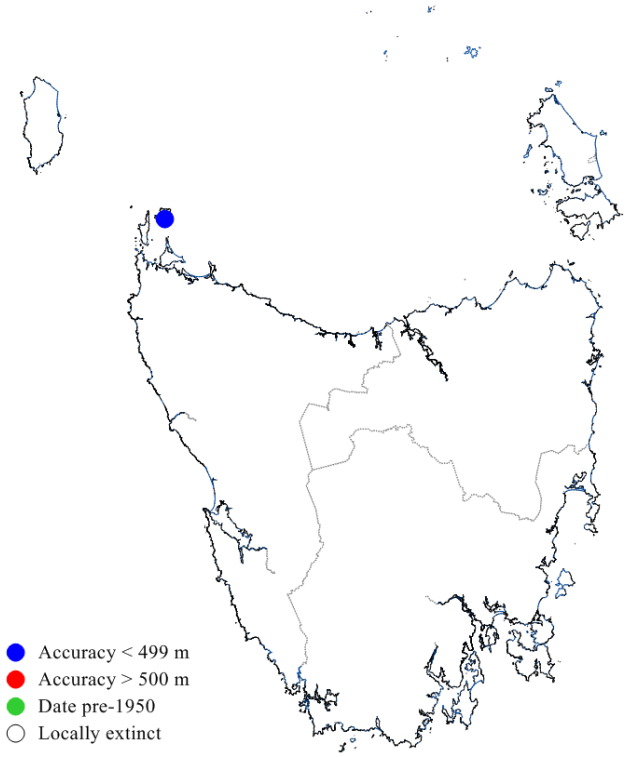

Figure 1. The distribution of *Prasophyllum atratum*

Plate 1. *Prasophyllum atratum* (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).

The flowering of *Prasophyllum atratum* is likely to be enhanced by fire and disturbance because it is most abundant on the slashed verge of an airstrip and virtually absent from adjacent dense heathland.

The species can only be identified from flowers The type material was collected on 4 November but the species may flower slightly earlier and it has been identified as late as 5 December so late October to mid December is the suggested survey period (Wapstra *et al.* 2008).

Description

Prasophyllum atratum has a leaf that is erect, terete, and 12 to 40 cm long and 3 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 8 to 15 cm long and usually partly withered at flowering. The inflorescence is 15 to 30 cm tall with the spike 5 to 10 cm long. The spike is well-spaced to moderately crowded with 8 to 25 flowers, 6.5 to 7.5 mm long and 5 to 6 mm wide. The flowers are brownish green to purplish green with a dark purplish labellum. The flowers open widely and are scented. The dorsal sepal is 5 to 7 mm long and 3 to 3.5 mm wide. The lateral sepals are free or fused at the base and are 5.5 to 7.5 mm long and 1.5 to 2 mm wide. The petals are 5 to 7 mm long and 1.2 to 1.5 mm wide, and projected forward to incurved. The labellum is sharply recurved near the middle, and is 4.5 to 5.5 mm long and 3 to 4 mm wide. The labellum is constricted near the middle and tapered with the blackish labellum callus extending nearly to the apex of the labellum.

[description from Jones 2006, Jones & Rouse 2006]

Confusing Species

Prasophyllum atratum is allied to *Prasophyllum rostratum* (Jones & Rouse 2006) but was previously included within the Tasmanian concept of *Prasophyllum pyriforme* (Jones *et al.* 1999). *Prasophyllum atratum* is recognised by the relatively small, dark coloured flowers, free lateral sepals (occasionally joined at the base), short labellum that is nearly orbicular at the base and with an extended tail-like apex, broad column wings with a truncate apex and pollinarium with a very short or vestigial humulus (Jones & Rouse 2006).

There are several differences between *Prasophyllum atratum* and *Prasophyllum rostratum*, 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 atratum*, especially for plants collected in northwestern Tasmania and other Bass Strait islands.

DISTRIBUTION AND HABITAT

Prasophyllum atratum is known only from the type location on the airstrip on Three Hummock Island in western Bass Strait (Table 1, Figure 1).

Prasophyllum atratum occurs in slashed sedgy heathland on grey sandy loam beside an airstrip on Three Hummock Island (Plate 2).

Table 1. Population summary for *Prasophyllum atratum*.

	Subpopulation	Tenure	NRM Region *	1:25000 Mapsheet	Year of census	Area occupied (ha)	Number of mature plants
1	Airstrip, Three Hummock Island	Three Hummock Island State Reserve	Cradle Coast	Rochon	1999 2006 2008	0.25 8.5	c. 70 43 c. 500 - 1000

*NRM region = Natural Resource Management region.

Heathlands comprise only about 1% of the island's vegetation and are most floristically rich in the slashed areas around the airstrip and in the most recently burnt areas (Harris & Balmer 1997, Corbett *et al.* 2006). According to Corbett *et al.* (2006), although this habitat type contains many components of similar habitat types on mainland Tasmania, it does not fit neatly into any TASVEG heath community (Harris & Kitchener 2005). Therefore *Prasophyllum atratum* occurs in a probably quite unique island habitat.

Plate 2. Habitat of *Prasophyllum atratum* on the airstrip on Three Hummock Island (Image by Matthew Larcombe)

POPULATION ESTIMATE

Prasophyllum atratum is known from a single subpopulation observed in 1999, 2001, 2002 2006 and 2008. Approximately 70 plants were present in a 0.25 ha area in 1999 and 43 were counted in 2006 (Department of Primary Industries, Parks, Water and Environment data). However a survey in November 2008 revealed between 500 and 1000 mature individuals over an area of approximately 8.5 ha, basically comprising the entire airstrip, and an additional single individual beside the road around 240 m south of the airstrip (Department of Primary Industries, Parks, Water and Environment data).

It is likely that the species does not regularly emerge on an annual basis, responding only to events such as slashing and/or fire and it is unlikely to emerge in drought years. Jones & Rouse (2006) suggested that the area adjacent to the airstrip may contain more plants but noted that the vegetation had not been burnt or slashed for at least 10 years so is very dense meaning that an extension to the subpopulation is only likely to be detected after a disturbance event. The discovery of an individual on the road that cuts through this surrounding vegetation in 2008 strengthens this argument.

Jones & Rouse (2006) suggested that the species may possibly extend to northwestern parts of Tasmania and King Island but there is no supporting evidence of this. However, the broad vegetation type supporting *Prasophyllum atratum* 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 atratum* is recently described, there is only a low likelihood of the species having been overlooked in such surveys. Since 1975 *Prasophyllum atratum* was attributed to *Prasophyllum pyriforme*, a species well known to local orchid enthusiasts. Therefore given the limited habitat on Three Hummock Island, the survey history under the name *Prasophyllum pyriforme*, and the likelihood of specific habitat requirements, it seems unlikely that subpopulations of *Prasophyllum atratum* large enough to influence its conservation status will be discovered in the future.

RESERVATION STATUS

Prasophyllum atratum occurs wholly within the Three Hummock Island Nature Reserve.

CONSERVATION ASSESSMENT

Prasophyllum atratum was listed in 2008 as endangered on schedules of the Tasmanian *Threatened Species Protection Act 1995,* at the time of assessment meeting criterion D because of an extremely small total population and very restricted area of occupancy (fewer than 250 mature individuals, area of occupancy less than 1 hectare, and occurrence in 5 or fewer locations).

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Prasophyllum atratum occurs as a highly localised subpopulation adjacent to an airstrip. Because of its localised distribution, stochastic events can lead to extinction.

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.

Regular slashing and associated burning of the slash on the airstrip is likely to have been beneficial to the orchid to date by allowing regular emergence and setting of seed. Regular slashing and/or ecological burning will be required to maintain the subpopulation. There is a risk that monitoring and management resources will be insufficient in future years to maintain an appropriate disturbance regime to allow persistence of the species, both on and off the airstrip.

Risks also include not firing at the most appropriate time of year. Hot summer fires are generally most favourable for leek-orchids for stimulating emergence and flowering (Jones *et al.* 1999) and provision of recruitment niches. However, such a fire regime is unlikely to be practical due to safety and infrastructure protection concerns. The more likely repeated spring or autumn burning may lead to the decline of the subpopulation in the long term.

The vegetation adjacent to the airstrip has not been burnt for about 12 years and it is likely that any dormant orchids that may exist in the unburnt vegetation will decline through the atrophy of underground tubers without appropriate disturbance. It is likely that slashing alone will be sufficient to allow persistence of the subpopulation on the airstrip (provided that slashing is not conducted when plants will be physically damaged on a regular basis), though there may be insufficient resources to allow slashing in areas other than those required to maintain the airstrip. Plants may be smothered if slash is not removed.

Airstrip upgrades and maintenance: Activities to upgrade and maintain the airstrip on Three hummock Island could be detrimental to the species should the requirements of the species not be taken into consideration. In particular, there are frequent proposals to spray the airstrip to control the build up of moss on the airstrip. This is likely to be detrimental to the orchids by directly impacting on the plants or their mycorrhizal fungi.

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

Stochastic events: While stochastic events are by definition unpredictable, in this case, such events are most likely to be associated with airstrip activities. Potential stochastic events include plane crashes, fuel spills and localised use of chemicals.

MANAGEMENT STRATEGY

What has been done?

The airstrip has been upgraded to improve safety (by meeting CASA standards), making commercial visitation to the island feasible and allow more effective and economically feasible management of the island by the Parks & Wildlife Service (PWS). Vegetation had reclaimed part of the airstrip and the upgrade has involved returning the strip to its original dimensions by removing the vegetation through slashing and burning of the slash. Appropriate markers and a wind signalling device have also been installed.

The upgrade followed discussions between PWS, the Threatened Species Section (Department of Primary Industries, Parks, Water and Environment) and an airport consultant, in which site-specific management prescriptions were developed. These included removing moss on the runway by 'smudging' (with sectioned tyres chained in sequence) rather than by spraying with copper sulphate (as proposed) as this would be detrimental to *Prasophyllum atratum* (and other orchids) by killing associated mycorrhizal fungi.

It is intended that the works will increase the amount of habitat suitable for persistence and expansion of the orchid subpopulation. As such a second (smaller) runway is being restored solely to provide additional suitable habitat. Monitoring will be undertaken to gauge the response of the orchid to the works. In November 2008, plots were established and baseline data collected for this monitoring program.

In November 2008, seed and mycorrhizal fungi were collected from the subpopulation for long-term storage at the Tamanian Seed Conservation Centre.

Prasophyllum atratum was not formally included in the *Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (TSU 2006), although the plan did identify the Three Hummock Island subpopulation of *Prasophyllum pyriforme* (now considered to be *Prasophyllum atratum*) to be a priority population for recovery actions.

Management objectives

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

What is needed?

- develop a management plan to specifically address the ecological requirements of the Three Hummock Island subpopulation of *Prasophyllum atratum* (and possibly other threatened flora species associated with the airstrip);
- include requirements of the species in fire management plans for Three Hummock Island;
- provide an appropriate disturbance regime to maintain the subpopulation and provide recruitment opportunities in nearby areas of potential habitat, including airstrip maintenance activities and ecological burning and/or slashing of surrounding vegetation;
- monitor the Three Hummock Island subpopulation during the flowering season to determine impacts of upgrade and maintenance activities on the species and to inform future management;
- conduct extension surveys of potential habitat on Three Hummock and other Bass Strait islands during the two flowering seasons following disturbance events;
- 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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Permit: It is an offence to collect, disturb, damage or destroy this species unless under permit.