Image by Mark Clements

Prasophyllum secutum

northern leek-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: ***Prasophyllum secutum*** D.L.Jones, *Australian Orchid Research* 3: 113 (1998)

Common Name: northern 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**

Tasmanian NRM Region: **Cradle Coast, North**

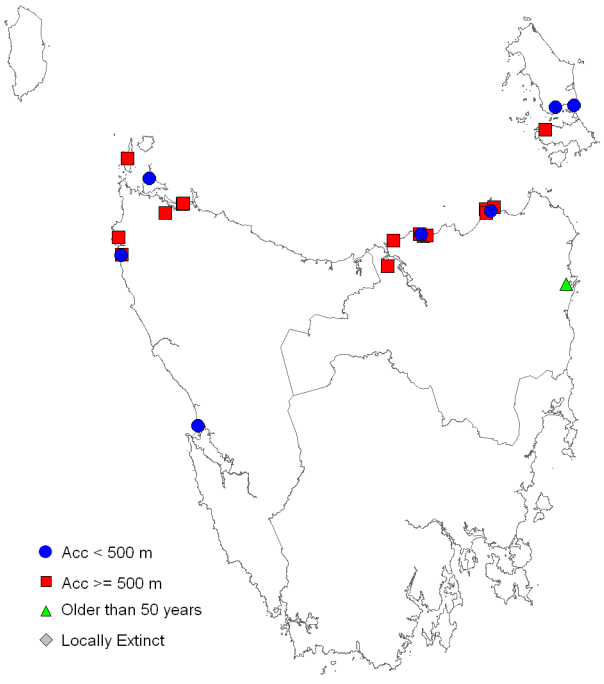

Figure 1. Distribution of *Prasophyllum secutum*, showing Natural Resource Management regions

Plate 1. *Prasophyllum secutum* (image by Mark Clements)

SUMMARY: *Prasophyllum secutum* is a terrestrial orchid endemic to Tasmania. It grows in densely shrubby stabilised dune swales and is known from about 18 scattered near-coastal occurrences in the State's north, some Bass Strait islands and an outlying site on the west coast. Location details for most sites are imprecise and coupled with the strong dependence of the species on fire to trigger emergence and good flowering, it is difficult to keep track of where the orchid is situated, and therefore difficult to prevent destruction of its habitat. Most subpopulations have not been detected since the late 1980s/early 1990s, with only two sightings since 1992. While abundance data is scant, the total population is estimated to be fewer than 500 plants occupying less than 10 ha, putting the species at risk from chance events, particularly for smaller subpopulations. Loss of habitat through historical clearing may explain the fragmented distribution of the species. The most important needs of the species are to prevent the destruction and degradation of known and potential habitat, and to promote recruitment through the management of its habitat using fire.

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. Some species may be prominent in disturbed sites such as slashed areas, or along track verges and road embankments (Jones et al. 1999). In the case of *Prasophyllum secutum*, the dependence on fire is very strong. The species seems to flower only after the dense vegetation of low-lying dune swales has been completely burnt off, making the species undetectable a few years after fire as the vegetation re-establishes. The opportunity for recruitment is therefore limited to short periods following fire.

Survey techniques

Flowers are required to identify *Prasophyllum secutum*. Apart from one record in late October all others have been in November. Given the strong dependence on fire to stimulate flowering, any survey effort should focus on sites burnt in the previous few years. Detecting this species is likely to be most successful when flowers are fully open but older flowers may still be identifiable, allowing the survey window to be extended for 1 to 2 weeks, depending on seasonal and local conditions. Collection of representative specimens and comparison to herbarium material or identification by a specialist is recommended.

Description

Prasophyllum secutum is a deciduous terrestrial orchid, 12 to 25 cm tall, with small, fleshy round or oval tubers. The leaf is erect, terete and pale to dark green, with a purple base. The leaf is 10 to 25 cm long and 3 to 4 mm wide. The free part of the leaf blade is erect to suberect, about 4 to 8 cm long and not usually withered at flowering. The inflorescence is a narrow moderately dense spike, 3.5 to 14 cm long, with 9 to 30 flowers. The flowers are 7 to 9 mm long and 4 to 5 mm wide. The flowers are light brown with a whitish labellum. The flowers do not open widely and are noted as being strongly fragrant. The ovary is projecting, broadly obovoid, 6 to 8 mm long and 3 to 4 mm wide, and green with dark ribs. The dorsal sepal is ovate-lanceolate, and 5 to 6 mm long and 2.5 to 2.8 mm wide. The lateral sepals

are narrowly linear-lanceolate, free from the base, erect to obliquely erect, and 6 to 7 mm long and 2 mm wide. The petals are narrowly oblong-ovate, 4.5 to 5.5 mm long and 1.3 mm wide, with a brown central line. The labellum is ovate-elliptical, 4.5 to 5.5 mm long and 3 mm wide. It is abruptly recurved at more than right angles near the middle, with the apex often protruding through the lateral sepals. The upper surface and margins of the labellum are covered with small elongate papillae, and the margins are slightly irregular. The callus is fleshy, green, broadly channelled, extending beyond the bend of the labellum, and is covered in small papillae. The column is about 1.5 mm long and 2 mm wide, with the appendages about as long as the anther.

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

Confusing species

Prasophyllum secutum is most similar to *Prasophyllum favonium* but can be distinguished from that species by its longer flowering spike, smaller strongly fragrant flowers and its whitish labellum (Jones 1998, Jones et al. 1999). The two species may co-occur in the Tiger Flat and Bottle Flat area in northwestern Tasmania.

DISTRIBUTION AND HABITAT

Prasophyllum secutum is endemic to Tasmania, where it has a disjunct distribution in coastal and near-coastal areas of the State's north, including islands in Bass Strait (Figure 1). The species occurs in dense coastal scrub in the swales of stabilised sand dunes and at least one site (Anthony Beach) is subject to periodic inundation in wet years. Soils are typically white to grey sands and sandy loams. The elevation range of recorded sites is from near sea level to about 30 m above sea level.

POPULATION PARAMETERS

Prasophyllum secutum is known in Tasmania from about 18 subpopulations (Table 1), but there is very little information available on most subpopulations, and many have not been observed for several decades (some since the 1800s). The species linear range is 333 km and extent of occurrence about 33,000 km^2 (the majority of which is unsuitable habitat). These figures do not take into account the historical sites cited in Jones (1998) (Table 1). The Georges Bay occurrence is likely to be extinct and would represent a significant range extension if found to be extant (Figure 1). Given the collector and date details, the 'near Stone Cottage' site is likely to be in the Circular Head region, possibly from the Anthony Beach area where the species was seen in the 1990s.

Reliable data for the area of occupancy exists only for two subpopulations (Table 1), with 200 to 250 plants in an area of 3.5 to 5 ha for these two locations. It is unlikely other subpopulations occupy substantially larger areas than these, and it is estimated that the total area of occupancy is in the order of 6 to 10 ha. There are few estimates of abundance (Table 1). Jones (1998) noted that the species may be 'locally common…and abundant only after fire'. The two most recent records for the species indicate locally low population densities, with three and five plants on Cape Barren Island and Robbins Island in 2007 and 2008, respectively. Most sites are believed to comprise relatively few plants (10 to 30), even after fire. It is unlikely that the total population would exceed 500 mature plants.

The distribution of *Prasophyllum secutum* in Tasmania suggests that it may well be present at further sites. However, discovery is likely to be serendipitous rather than as a result of targeted surveys given the often highly localised occurrences coupled with the brief detection window following fire.

RESERVATION STATUS

Prasophyllum secutum has been recorded from Arthur-Pieman Conservation Area, Hunter Island Conservation Area, Logan Lagoon Conservation Area, Ocean Beach Conservation Area, Strzelecki National Park and Waterhouse Conservation Area.

CONSERVATION ASSESSMENT

Prasophyllum secutum was listed as vulnerable on the Tasmanian *Threatened Species Protect Act 1995*

Table 1. Population summary for *Prasophyllum secutum*

	Subpopulation	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of individuals
1	Southwest of Logan Lagoon	Logan Lagoon Conservation Area	North	Fisher	1992	unknown	unknown
2	Reddins Creek	Strzelecki National Park	North	Fisher	1992	unknown	unknown
3	Prickly Bottom Flats, Cape Barren Island	Aboriginal Land Council of Tasmania	North	Anderson	2007	unknown	3
4	Waterhouse Point	Waterhouse Conservation Area	North	Waterhouse	1989 (1980)	unknown	unknown
5	South Croppies Point Road	Waterhouse Conservation Area	North	Waterhouse	1983	unknown	unknown
6	Lulworth	Crown land	North	Tam O'Shanter	1990 (1989)	2–3	100–150
7	Weymouth Road	Crown land	North	Weymouth	1990	unknown	unknown
8	near Long Flat, Aerodrome Road *	private land	North	Low Head	1971	unknown	unknown
9	Anthony Beach	private land	Cradle Coast	Stanley	1992 (1990)	1.5–2	100
10	near Mella, west of Smithton	private land	Cradle Coast	Mella	1992	unknown	unknown
11	Robbins Island	private land	Cradle Coast	Robbins	2008	0.0001	5
12	Hunter Island	Hunter Island Conservation Area	Cradle Coast	Cuvier	1975	unknown	unknown
13	Jim Crowe Scrub	Arthur-Pieman Conservation Area	Cradle Coast	Bluff	1992	unknown	unknown
14	Tiger Flat/ Bottle Flat	Arthur-Pieman Conservation Area	Cradle Coast	Sundown	1990	unknown	unknown
15	Lake Strahan	Ocean Beach Conservation Area	Cradle Coast	Henty	1992	unknown	unknown
16	near Beaconsfield	unknown	North	Beaconsfield?	1968	unknown	unknown
17	Georges Bay *	unknown	North	unknown	late1800s/ early1900s	possibly locally extinct	
18	'near Stone Cottage' *	unknown	Cradle Coast?	unknown	1837	unknown	unknown

NRM region = Natural Resource Management region; * cited by Jones (1998)

in 2002, and uplisted to endangered in 2008, meeting the following criteria:

- B. Area of occupancy estimated to be less than 10 hectares, and there are extreme fluctuations in the number of mature individuals and a continuing decline inferred in the area, extent and/or quality of habitat, number of locations and number of mature individuals;
- C. Total population estimated to number fewer than 2500 mature individuals, with no subpopulation with more than 250 individuals, and a continuing decline inferred in the area, extent and/or quality of habitat, number of locations and number of mature individuals.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Due to the limited amount of information on most subpopulations of *Prasophyllum secutum*, it is difficult to assess specific threats and develop management strategies. However, the threats to the species are similar to those faced by many threatened orchid species with widespread and fragmented distributions and usually low population numbers. The risk to the species is exacerbated by the dependence on mycorrhizal fungi, which may make the species susceptible to additional factors.

Land clearing: Much of the favoured coastal heath habitat of *Prasophyllum secutum* on the north coast of mainland Tasmania has been destroyed or degraded by agriculture and coastal development. Many of the non-reserved occurrences are now in remnant vegetation. Clearing and pasture development is an ongoing threat. The potential for the inadvertent loss of habitat is high for undetected occurrences or occurrences with imprecise location details given that the species may only be detectable for up to a few years following high intensity fire which stimulates flowering, allowing the species to be detected.

Inappropriate disturbance: The flowering of *Prasophyllum secutum* is closely linked to high intensity summer fires, which denudes the low-lying stabilised dune swales of competing vegetation for a period of a few years, allowing the species to emerge, flower and set seed. While the species possesses 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 the species (Jones et al. 1999). The longevity of tubers is not known but it is assumed to be comparable with the natural fire frequency of near-coastal vegetation (perhaps 6 to 15 years). The relatively high abundance of plants at Anthony Beach when seen in the 1990s had been attributed to burning in a mosaic fashion at irregular intervals allowing recruitment from seed. Grazing by stock (cattle) is likely to present a risk to some subpopulations on non-reserved land. The subpopulation at Lulworth is at risk, being immediately adjacent to an old, now abandoned and very weedy rubbish tip, in an area of sandy coastal heath subject to use by 4WD vehicles, digging for sand, and rubbish dumping.

Stochastic events: The widespread and disjunct distribution of the species provides a degree of security to the population as a whole. However, the small size of subpopulations exposes them to a risk of extinction due to chance events.

Climate change: It is possible that even minor shifts in average seasonal conditions may have an adverse impact on locally restricted species such as *Prasophyllum secutum*, especially if supporting vegetation is affected or disturbance regimes are altered, or changed rainfall patterns compromise recruitment after fire events.

MANAGEMENT STRATEGY

Management objectives

The main objectives for the management of *Prasophyllum secutum* are to relocate subpopulations not seen since the 1990s, increase the number of known subpopulations through survey, protect known habitat and manage habitat to promote recruitment.

What has been done?

Management planning: *Prasophyllum secutum* was included in the *Flora Recovery Plan: Threatened Tasmanian Orchids 2006–2010* (Threatened Species Unit 2006). The Recovery Plan is in the process of being revised.

Survey: Extensive searches for the species in the Waterhouse area prior to 2008 failed to relocate the species.

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- 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;

- develop management agreements with private landowners and public land managers;
- implement the *Threatened Tasmanian Orchids Recovery Plan* and incorporate the management requirements of the species into relevant reserve management plans and fire management plans;
- attempt to relocate sites with imprecise location details or that have not been seen since the 1990s:
- undertake extension surveys based on known sites, radiating out into potential habitat, especially after major fire events in near-coastal sites;
- undertake regular demographic monitoring at a selection of subpopulations to better understand management requirements to promote recruitment and to determine the possible impacts of climate change;
- collect seed and associated mycorrhizal fungi for long-term storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens, Hobart.

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