



Caladenia saggicola

sagg spider-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Matthew Larcombe

Scientific name: *Caladenia saggicola* D.L. Jones *Austral. Orch. Res* 3:39 (1998)

Common name: sagg spider-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: **South**

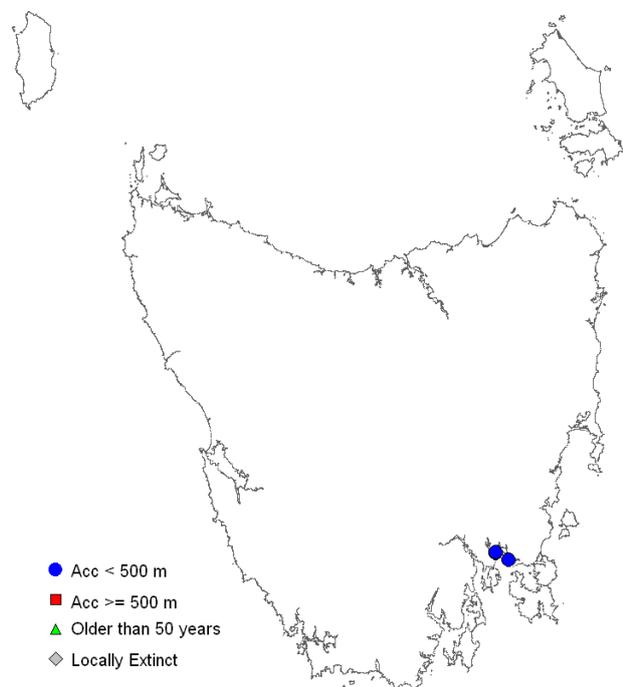


Figure 1. Distribution of *Caladenia saggicola*.



Plate 1. *Caladenia saggicola*
(image by Matthew Larcombe)

SUMMARY: *Caladenia saggicola* is a terrestrial orchid endemic to southern Tasmania. It is known from two subpopulations, one near Cambridge (with up to 450 plants) and the other at Dodges Ferry (3 plants). At the Cambridge site the species grows in *Eucalyptus viminalis* (white gum) woodland on deep sands, with a ground layer dominated by the graminoid *Lomandra longifolia* (sagg). The species is at risk from land clearance, an inappropriate fire regime and disturbance by rabbits, with a high risk of local extinctions due to the small size of the sites.

IDENTIFICATION AND ECOLOGY

Caladenia saggicola belongs to the large-flowered section of the genus *Caladenia*, the so-called 'spider-orchids' (Jones et al. 2001). Spider-orchids have large flowers with long tapered or filamentous segments. All *Caladenia* species are deciduous and die back after flowering to small subterranean tubers. Plants have a single narrow basal leaf that appears above ground in late autumn or early winter following rains.

Caladenia saggicola uses food deception to attract generalist pollinators, probably native bees (Lewis-Jones, pers. comm.). It reproduces from seed. The species has been reported to respond favourably to ground disturbance by animals (Jones et al. 1999), and is known to flower freely in the absence of fire.

Little is known about the mycorrhizae associated with this species. Studies have shown that below-ground mycorrhizal health affects *Caladenia* and other orchid species (Batty et al. 2006, Scade et al. 2006). Organic matter in soils and fire frequency influence mycorrhizae, which in turn may affect orchid establishment and expansion (Grant & Koch 2003).

Survey techniques

Caladenia saggicola can only be identified with certainty when flowering. The species flowers from September to October (Wapstra et al. 2012), the peak in flowering depending upon seasonal conditions.

Description

Caladenia saggicola has a single basal leaf which is densely hairy with a purple blotched base, 3 to 22 cm long and 4 to 11 mm wide. Plants are up

to 40 cm tall when in flower, with a wiry and densely hairy stalk bearing one or (rarely) two flowers. The flower is up to 70 mm across and is white to cream, with very pale reddish lines and tail-like extensions with dark grey to blackish tips (Plate 1). The dorsal sepal is 30 to 60 mm long and 2 to 3 mm wide, the lateral (lowermost) sepals 30 to 60 mm long and 3.5 to 5 mm wide, and the petals 27 to 50 mm long and 2 to 3.5 mm wide. The flowers have a labellum (lip) which is hinged at the base and bears rows of conspicuous, variously shaped and coloured protuberances (calli) on the upper surface. The labellum margins often also bear calli or may be deeply lobed or toothed. The labellum is white to cream, with dark reddish purple calli. The column behind the labellum is translucent with reddish markings (Jones 1998, Jones 2006, Jones et al. 1999).

Confusing species

Caladenia saggicola is superficially similar to *Caladenia anthracina* and *Caladenia patersonii* but can be distinguished from these species by its whiter flowers and paler and less prominent markings (Jones et al. 1999). *Caladenia patersonii* has larger flowers with wider, tail-like extensions.

DISTRIBUTION AND HABITAT

Caladenia saggicola is endemic to southern Tasmania. The species is known from two sites, one near Cambridge and the other about 10 km to the southeast at Dodges Ferry (Figure 1).

At the Cambridge site the species grows amongst white gum woodland with a ground layer dominated by sagg on well-drained, grey sandy loams (Plate 2). Habitat at Dodges Ferry consists of woodland dominated by sheoak (*Allocasuarina verticillata*) and white gum on yellow to grey sandy loams over Triassic sandstone.

The altitude of the known sites is 5–15 m above sea level, and the mean annual rainfall about 500 mm.

Table 1. Population summary for *Caladenia saggicola*

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	Cambridge	Private property	South	Carlton	2016 (1994)	c. 7	Up to 500
2	Dodges Ferry	Council reserve	South	Carlton	2016 2012 (2007)	0.001	1 3

NRM region = Natural Resource Management region



Plate 2. Habitat at the Cambridge site, Sept 2009 (image by Richard Schahinger)

RESERVATION STATUS

Caladenia saggicola is not formally reserved.

POPULATION PARAMETERS

The Cambridge subpopulation supports up to about 500 flowering plants in any given year. Plant numbers are known to fluctuate considerably from year to year: annual counts over the period 2007–2016 revealed 180, 120, 440, 120, 300, 375, 270, 430, 60 and 500 flowering plants, respectively, the ‘high’ figures in 2009 and 2016 coming after a very wet late autumn and early winter following years of drought. The Dodges Ferry subpopulation was discovered in 2007, with only three plants seen to date (Table 1).

The species has a linear range of 9.9 km, extent of occurrence of 1.9 km² (much of which is sea), and an area of occupancy of about 7 ha (Table 1).

It is considered unlikely that *Caladenia saggicola* will be found beyond the immediate vicinity of the known sites, as targeted searches of apparently suitable habitat by DPIPWE personnel and orchid enthusiasts have been unsuccessful. Suitable habitat occurs on land adjacent to the Cambridge site at Hobart Airport. However, the habitat is overgrown and the orchids, if present, are unlikely to become apparent without a fire.

CONSERVATION ASSESSMENT

Caladenia saggicola was listed as endangered on the Tasmanian *Threatened Species Protection Act 1995* in 2001. It meets the following criteria:

- area of occupancy less than 10 hectares;
- known to exist at no more than 5 locations;
- extreme fluctuations in the number of mature individuals.

THREATS AND LIMITING FACTORS

Clearance: The species’ habitat is likely to have been severely fragmented by past clearing. The Dodges Ferry site occurs directly opposite the Seven Mile Beach sand spit, which prior to clearing/conversion to pine-plantation would have provided a continuous habitat corridor from the Cambridge site. There is now very little suitable habitat remaining in the vicinity of the two known subpopulations. Loss of habitat in the Cambridge area as a result of residential and/or commercial development remains a threat to any potential subpopulations.

Caladenia saggicola is afforded some protection from clearing through the forest practices

system, with a Forest Practices Plan required for the clearing of any trees in habitat containing threatened species or threatened vegetation communities. The Cambridge subpopulation occurs in *Eucalyptus viminalis* – *Eucalyptus globulus* coastal forest and woodland (Harris & Kitchener 2005), a vegetation community listed as threatened under the Tasmanian *Nature Conservation Act 2002*. The current landowners of the main site are sympathetic to and appreciate the conservation needs of *Prasophyllum milfordense*. However, if the property were to change into less conservation-minded hands there is a risk of inappropriate management or even clearance.

The Dodges Ferry subpopulation is also at risk of being cleared, a consequence of pressure to reduce the risk of fire to nearby housing.

Fire and drought: It is presumed that fire is required to maintain habitat suitable for *Caladenia saggicola*. A prolonged lack of fire may lead to the formation of a dense understorey, with a deleterious impact on the species. Prior to European settlement the species' habitat is likely to have experienced irregular hot summer fires. Since European settlement, the Cambridge site has been burned irregularly as a part of the property management (property owner, pers. comm.).

Low numbers of flowering plants were observed following two different fuel reduction burns at the Cambridge site in the 1990s. This has been attributed to the timing of the burns, as lower than average rainfall occurred for the following two seasons. Drought following fire may limit recruitment and reduce plant health, resulting in plant mortality.

Rabbit grazing and other browsers: Rabbits pose an ongoing threat to the species, occurring in high numbers at both sites. The owners of the Cambridge site have observed rabbits digging up orchid tubers during dry seasons. While diggings may help to maintain an open habitat suitable for growth or germination of *Caladenia saggicola*, the destructive impacts of rabbits are likely to result in a net loss of plants over time, as observed by other researchers (Scade et al. 2006). The impacts of native browsers, such as brushtail possums and bandicoots are unknown. Fencing to reduce rabbit grazing and other browsing in dry years or at specific times of the year was considered

necessary to prevent a decline in this subpopulation.

Stochastic risk: Due to the small restricted nature of both subpopulations the species is considered to be at risk from unforeseen human activities or chance events. The Dodges Ferry subpopulation may not be viable in the longer term given that it is very small (3 plants) and occurs in a very small remnant (0.15 ha) surrounded by roads and residential development.

Climate change: *Caladenia saggicola* occurs at sites of naturally low rainfall; however, even minor shifts in average seasonal conditions have the potential to exacerbate the species' precarious position.

MANAGEMENT STRATEGIES

The main objectives for the recovery of *Caladenia saggicola* are to prevent the inadvertent destruction of the known subpopulations and promote conditions for its successful recruitment.

What has been done?

Recovery Plan: *Caladenia saggicola* is addressed in the *Threatened Tasmanian Orchid Flora Recovery Plan 2006–2010* (Threatened Species Section 2006) and also in the *Draft Flora Recovery Plan: Tasmanian Threatened Orchid* (Threatened Species Section 2017).

Fencing: A rabbit-proof fence enclosing about 2 ha of prime habitat was erected at the Cambridge site in 2007 to afford the species' densest occurrences some protection.

Fire management: A fire management plan was developed for the Cambridge site in 2008 with the aim of promoting suitable habitat for the species. The first of a series of proposed burns was conducted in April 2009, with a 5.8 ha area burnt successfully and according to prescription; colonisation of this area by the species was recorded in 2011. Further burns were undertaken in April 2013 and April 2015 with the assistance of the Tasmanian Fire Service's Cambridge crew

Pollinator research: An Honours project was developed in 2008 by DPIPWE's Threatened Species Section and the University of Tasmania to investigate the pollination syndromes used by *Caladenia saggicola*. Contrary to anecdotal

suggestions, it was shown that the species is food deceptive, not sexually deceptive (Lewis-Jones, pers. comm.).

Seed collection: Seed and mycorrhizal fungi were collected in 2008 as part of the Millennium Seed Bank Project; germination testing has been conducted at the Royal Tasmanian Botanical Gardens (Hobart) with an ex situ holding of flowering plants established in 2016.

Survey & Monitoring: Extension surveys of around 50 ha of suitable habitat in the vicinity of both subpopulations were conducted in 2008. A demographic transect was established at the Cambridge site in 2009 by DPIPWE's Threatened Species Section. The transect has been re-scored annually with the assistance of volunteers with the Wildcare group Threatened Plants Tasmania, and the extent of the population mapped (Table 1).

What is needed?

The following management actions are proposed for *Caladenia saggicola*:

- pursue increased security through vegetation management agreements or conservation covenants;
- monitor subpopulations for fluctuations in abundance, especially after fire or changed management in order to monitor the effectiveness of actions and to inform future management needs.
- finalise the *Recovery Plan for Tasmanian Threatened Orchids* and implement actions as appropriate;
- 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 areas of potential habitat;
- continue to implement the fire management plan for the Cambridge site;
- consider selective vegetation removal at the Dodges Ferry site to reduce the risk of fire to adjacent housing and hence pressure on the species' habitat through fuel reduction burning;

- maintain an ex situ holding at the Royal Tasmanian Botanic Gardens;
- search for new subpopulations in suitable habitat in the vicinity of known sites.

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