

# *Thelymitra mucida*

plum sun-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT



*Thelymitra mucida* flower from  
Wilson's Promontory, Victoria  
(image by Jeff Jeanes)

**Scientific name:** *Thelymitra mucida* Fitzg., *Gard. Chron.* 17: 495 (1882)

**Common name:** plum sun-orchid

**Group:** vascular plant, monocotyledon, family **Orchidaceae**

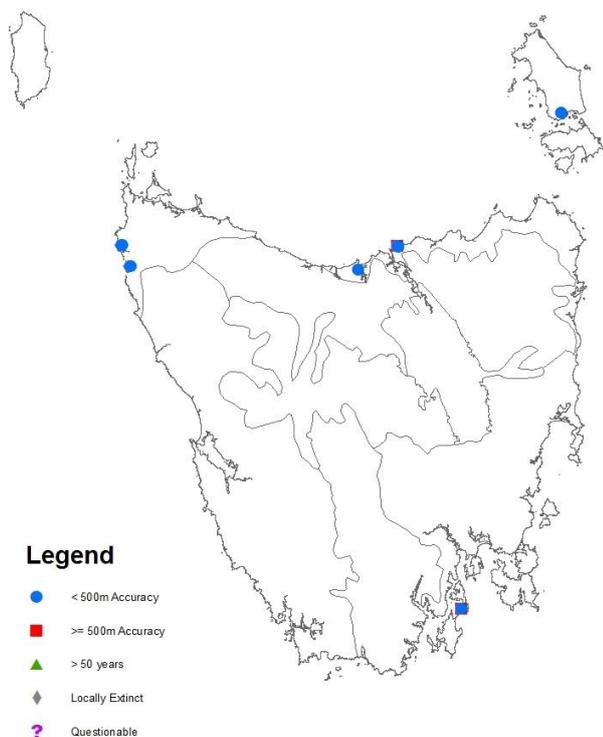
**Status:** *Threatened Species Protection Act 1995*: **rare (uplisting to endangered pending)**

*Environment Protection and Biodiversity Conservation Act 1999*: **Not Listed**

**Distribution:** Biogeographic origin: **not endemic to Tasmania**

Tasmanian NRM Regions: **Cradle Coast, North, South**

Tasmanian IBRA Bioregions (V6): **King, Flinders, South East**



**Figure 1.** Distribution of *Thelymitra mucida* in Tasmania, showing IBRA bioregions (V6)



**Plate 1.** *Thelymitra mucida* flower from Rubicon Sanctuary (Image by Phil Collier)

**SUMMARY:** *Thelymitra mucida* (plum sun-orchid) is a deciduous terrestrial orchid known in Tasmania from only six locations, despite numerous surveys in known and potential habitat. The species is typically rare and seldom collected and it is likely that the species occupies less than 1 ha and consists of fewer than 250 mature individuals in total in Tasmania, putting the species at a high risk of local extinctions from inadvertent or chance events. In Tasmania, recent collections indicate that the species is most strongly associated with winter-wet sedge heathlands at low elevations in near-coastal sites. Likely threats to the known sites include losses through vegetation clearance or land management changes, inappropriate fire or disturbance regimes and climate change.

#### IDENTIFICATION AND ECOLOGY

Species of *Thelymitra* are commonly called sun-orchids because the flowers of most species open only in warm to hot weather, particularly on bright, sunny days. *Thelymitra* species are perennial terrestrial orchids that die back after flowering to fleshy subterranean tubers. They are all spring or summer flowering. Most species have a single narrow basal leaf. Unlike most orchids, the labellum (lip) of the flower is generally similar in shape and size to the petals. Features of the column in the centre of the flower are important in identification. In all species the column has two arm-like projections that flank the anther (pollen holding structure).

Flowers of *Thelymitra* species are thought to mimic native irises and lilies, thus attracting a similar suite of pollinating insects, such as small native bees, that attempt to collect pollen and often bring about pollination (Jones et al. 1999). Jones (2006) notes that *Thelymitra mucida* has self-pollinating flowers that open tardily on hot days and may not open at all in cool seasons. The family Orchidaceae is characterised by a high speciation rate, particularly when self-pollination is involved, largely accounting for their often restricted distributions. There are currently 212 species in the family native to Tasmania, with *Thelymitra mucida* being one of 38 *Thelymitra* species (de Salas & Baker 2019), 11 of which are listed on Schedules of the

Tasmanian *Threatened Species Protection Act 1995*. Hybrids with *Thelymitra mucida* have been recorded (Backhouse et al. 2016).

*Thelymitra* species may be out-competed as their habitat becomes dense over time in the absence of disturbance, preventing emergence, flowering and seed-set necessary for the replenishment of their underground tubers and recruitment from seed. Attrition of tubers may be expected following long periods in a dormant state during unfavourable conditions, compromising the long-term persistence of a species in an area (Jones et al. 1999). The flowering of many sun-orchids is enhanced by disturbance (Jones 2006, Collier & Garnett 2014). *Thelymitra mucida* responds positively to summer fires and the species can be found in disturbed areas such as slashed swamp margins, old quarries and tracks.

Orchids rely on associations with mycorrhizal fungi for germination and growth with disturbance affecting the species directly or indirectly by impacting on their mycorrhizal fungi (Jasinge et al. 2018).

#### Survey techniques

Most records of *Thelymitra mucida* on mainland Australia were made from mid-October to early December (*Atlas of Living Australia* accessed September 2018). In Tasmania surveys for *Thelymitra mucida* should be undertaken after recent disturbance during November, its peak flowering period, ideally in hot weather when its flowers are most likely to be open (Jeanes 2004, Jones 2006, Wapstra 2018).

#### Description

*Thelymitra mucida* has a leaf that is 10 to 30 cm long and 2 to 8 mm wide. The leaf is linear, channelled, fleshy and channelled. The slender flower stems are 18 to 55 cm tall. The inflorescence usually consists of 1 to 6 flowers, which are 14 to 22 mm across, and pale to dark blue or purplish, often with pink tones. The often shortly pointed sepals and petals are 6 to 12 mm long and 3 to 6.5 mm wide. The column is 4 to 6 mm long and 2.5 to 3.7 mm wide. The post-anther lobe (hooding the anthers) is 2.5 to 3.5 mm long and 1.5 to 2.5 mm wide, tubular and inflated, and is

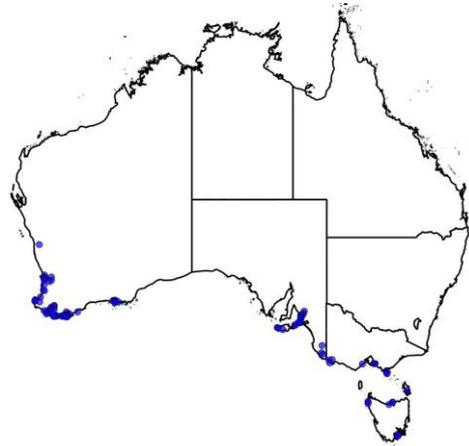
narrow at the base, widening abruptly towards the apex, the apex being deeply split into two lobes that are 1 to 2 mm long. It is purplish brown with a yellow apex, and the back surface is covered with a thick, sticky, secretion. The column arms are 1 to 2 mm long, with a toothbrush-like tuft of untidy bright yellow or cream course hairs.

[description based on Jeanes 2004, Jones 2006]

**Confusing species**

*Thelymitra mucida* is one of three *Thelymitra* species with the post-anther lobe often covered with a waxy or glistening bloom, the other species being *Thelymitra inflata* and *Thelymitra lucida*. It can be distinguished from these by a combination of characters including its pale to dark blue or purplish flowers, usually with strong pink colourations, the more or less wedge-shaped post-anther lobe, which is quite narrow at the base and widens abruptly above, and the hairs on the column arms, which are

usually bright yellow, few, sparse, relatively thick, long and untidy (Jeanes 2004, Jones 2006).



**Figure 2.** Distribution of *Thelymitra mucida* (*Atlas of Living Australia*, downloaded 14/10/2019)

**Table 1.** Population summary for *Thelymitra mucida* within Tasmania

	Subpopulation	Tenure	NRM Region *	1:25000 Mapsheet	Year (first)seen	Area occupied (ha)	Flowering plants (emerged plants)*
1	Arthur River Road near Bluff Hill turnoff	Arthur-Pieman Conservation Area	Cradle Coast	Bluff	2012 2010 2009 (2008)	0.001	7 70 9 6
2	Temma Road near Nelson Bay turnoff	Arthur-Pieman Conservation Area	Cradle Coast	Sundown	2017	0.0002	2
3	Rubicon Sanctuary*	covenanted private land	Cradle Coast	Port Sorell	2018 2017 2016 2015 2014 2013 2012 2011 (2010)	0.1 0.0001	0 (51) 6 (60) 13 (60) 0 (46) 3 (58) 0 (52) 1 (41) 16 (28) 1
4	Aerodrome Road, near Low Head	private land	North	Low Head	1992 (1971)	unknown	unknown
5	Reddins Creek, Flinders Island	private land	North	Fisher	1992	unknown	unknown
6	Bruny Island**	private land	South	Great Bay	1980 (1969)	status uncertain	

\* Plant numbers from monitoring results (Collier 2013, pers. comm. 2019), with one site burnt in 2009 and slashed in 2012, and the other site slashed in 2010. Both sites were burnt in 2015.

\*\* There are specimens from 1969 and 1971 from Bruny Island, and a record (but no supporting specimen) from 1980, which falls near the airstrip (the recognised most likely location of the Bruny Island collections of *Thelymitra mucida*) – these records are taken to be from the same location i.e. the airstrip.

## DISTRIBUTION AND HABITAT

*Thelymitra mucida* occurs in Western Australia, South Australia, Victoria and Tasmania (Figure 2). In Tasmania, the species has been recorded from West Coast near Bluff Hill and Nelson Bay, Port Sorell, Low Head, Flinders Island and on Bruny Island (Figure 1, Table 1).

On the mainland, *Thelymitra mucida* occurs in moist to wet depressions, swamp margins and other low-lying sites in coastal and near-coastal heathland, heathy forest and shrubland in dark sandy or peaty soils, usually below about 50 m elevation (Jones & Clements 1998, Jones et al. 1999, Jones 2006). In Tasmania, recent collections indicate that the species is most strongly associated with winter-wet sedgy heathlands at low elevations in near-coastal sites.

## POPULATION ESTIMATE

*Number of subpopulations* <10 (6 known)

*Number of locations* < 10 (6 known)

*Extent of occurrence* ~48,000 km<sup>2</sup>

*Area of occupancy* < 1 ha

*Area of occupancy (as per IUCN criteria)* = 24 km<sup>2</sup>

*No. of mature individuals* < 250 (sum of maximum count of plants with flowers at each site = 88)

Jeanes (2004) noted that *Thelymitra mucida* is common and widespread in Western Australia. However, it is rare and seldom collected in the Eastern States, perhaps a result of its highly localised distribution (Jones 2006), tardiness in opening its flowers, likely short flowering period and tendency to flower only in response to disturbance. Also, it may be that the species relies on an exacting set of circumstances such as disturbance at a specific time of year combined with adequate moisture levels to emerge and flower (see Jasinge et al. 2018). It is unlikely to be overlooked when in flower because of its distinctive bloom on the post anther lobe.

Jeanes (2004) noted that the Bruny Island occurrence was rather doubtful because its identity was determined from a single, poorly preserved, fragmentary specimen. The Bruny Island airstrip site is a well-known native orchid hotspot yet *Thelymitra mucida* has not been

sighted there despite numerous surveys by orchid enthusiasts since the species was last seen in 1980. It is feared that habitat at the site may no longer be suitable as the swampy edge of the airstrip favoured by the species is no longer present (Mark Wapstra pers. comm.). The current status of another two subpopulations is uncertain given that they have not been seen since the early 1990s. However, more data may be required to invoke a continuing decline for the formal assessment of extinction risk of the species. There may be a continuing decline in the area, extent and/or quality of habitat given the presumed loss of preferred habitat at the Bruny Island site, and inappropriate disturbance at the Arthur River Road site which is on the road edge used by trucks and other vehicles as a turning circle and for seasonal placement of bee hives, and is subject to rubbish and garden waste dumping.

The number of subpopulations is estimated to be no more than 10 as, although several new subpopulations have been discovered in recent years in the north of the State increasing the likelihood that more will be found, the current status of half of the recorded subpopulations is uncertain. For many terrestrial orchids such as *Thelymitra mucida*, not all mature plants will flower every year, and some occurrences may not emerge and flower until their habitat is opened up by disturbance such as fire or if climatic conditions are unfavourable, making it difficult to estimate the total number of mature individuals. A substitute measure considered suitable for such species is the sum of the maximum number of flowering plants seen at each site over a number of years. As such and considering the highly localised occurrences typical of the species and the uncertain status of half of the known subpopulations, the total population is estimated to number fewer than 250 mature individuals and occupy less than 1 ha (Table 1).

## RESERVATION STATUS

*Thelymitra mucida* occurs in the Arthur-Pieman Conservation Area and on one private property in an area covered by a conservation covenant

under the Tasmanian *Nature Conservation Act 2002* (Table 1).

#### CONSERVATION ASSESSMENT

*Thelymitra mucida* was listed as rare on schedules of the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being, having been determined to occur in 20 or less 10 x 10 km Australian Map Grid squares in Tasmania (FAC 1994). The species is in the process of being uplisted to endangered following reassessment of the conservation status of the species in 2019, the species meeting the following criterion:

D: Total population extremely small or area of occupancy restricted, and

1. total population estimated to number fewer than 250 mature individuals.

#### THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

*Thelymitra mucida* is typically highly localised and within Tasmania, has been recorded from just six sites, making the species vulnerable to inadvertent destruction and stochastic events. This is exacerbated by the reliance of the species on mycorrhizal fungi which also have their own requirements and tolerances. The main threats to *Thelymitra mucida* are discussed below:

**Land clearing or changed management:** Historically, significant areas of potential habitat have been cleared and this may explain the disjunct contemporary distribution of the species. The future of the Bruny Island airstrip is under consideration, risking future changes to management that may be unfavourable to native orchids. The highly localised occurrences and short and spasmodic detection periods of *Thelymitra mucida* increase the risk of clearing or changed management practices in as yet undetected subpopulations and potential habitat.

**Inappropriate disturbance:** While fire may promote emergence and flowering, the results of Jasinge et al. (2018) suggest that it may be prudent to restrict planned burns in the habitat of *Thelymitra mucida* to dry periods in the

absence of emergence of the species to lessen the impact on associated mycorrhizal fungi. If the species emerges it would be prudent to time burns to immediately following seed release, though if climatic conditions are too dangerous for burning, slashing may be a preferable disturbance to reduce competition. The Arthur River Road occurrence is at risk from continued disturbance from vehicles, including trucks associated with the nearby placement of beehives, and dumping of rubbish and garden waste.

**Climate change:** It is likely that even minor shifts in average seasonal conditions may have an adverse impact on such a locally restricted species as *Thelymitra mucida*, especially if other ecological factors such as appropriate fire or disturbance regimes are absent. The risk is exacerbated by impacts to the mycorrhizal fungi upon which the species relies. In particular, the preference of the species for moist habitats makes it susceptible to changed rainfall patterns leading to the drier growing conditions associated with climate change in Tasmania leading to a decrease in emergence and flowering and attrition of tubers in the long term.

**Stochastic events:** The small and highly localised occurrences of the species mean that the risk of inadvertent destruction due to chance events is high, particularly for as yet undetected sites given the short and apparently spasmodic detection periods.

#### MANAGEMENT STRATEGY

##### What has been done?

The Rubicon Sanctuary was acquired by the Tasmanian Land Conservancy's (ILC) Revolving Fund, in particular to protect the significant variety of orchids, many of which are threatened, at the site. The site was covenanted and on sold to owners that instigated a fire or slashing regime to favour the orchids, resulting in the discovery of *Thelymitra mucida* which has been included in a long term intensive monitoring program to determine the response to disturbance (Collier & Garnett

2014). The property has now been gifted back to the TLC which it will retain.

Members of Wildcare's Threatened Plants Tasmania group have surveyed potential habitat for the species resulting in the discovery of three subpopulations of *Thelymitra mucida*. The Bruny Island site has been searched numerous times by orchid specialists and enthusiasts, and while these surveys have detected several species of *Thelymitra*, no additional sightings of *Thelymitra mucida* have been noted.

*Thelymitra mucida* was formally included in the Recovery Plan for threatened Tasmanian orchids (Threatened Species Section 2017) with a priority noted for the need for baseline surveys.

### Management objectives

The main objectives for the recovery of *Thelymitra mucida* are to prevent the loss or degradation of known subpopulations and potential habitat in their immediate vicinity, determine the status of subpopulations at sites where the species has not been recorded since the 1990s, and increase the number of known subpopulations through survey.

### 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;
- erect barriers to protect the Arthur River Road site from damage from vehicles and rubbish dumping;
- determine the precise extent and condition of known subpopulations;
- conduct extension surveys radiating out from known sites;

- monitor known sites regularly for emergence and threats;
- in the absence of emergence of the species, implement burns or slash to reduce competition if sites become overgrown, or when fuel reduction burns are needed, restrict any planned burns to dry periods;
- if the species has emerged, restrict planned fuel reduction burns to immediately following seed release, or slash when plants have died down to reduce fuel loads or reduce competition if needed;
- implement the Recovery Plan for threatened Tasmanian orchids (Threatened Species Section 2017) and include the species in any revision of the plan;
- collect seed for long-term conservation storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens.

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