

Thelymitra lucida

glistening sun-orchid

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by Peter Fehre

Scientific name: *Thelymitra lucida* Jeanes, *Muelleria* 19: 70 (2004)

Common name: glistening sun-orchid

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

Status: *Threatened Species Protection Act 1995*: **endangered**

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

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

Tasmanian Natural Resource Management regions: **South**

Tasmanian IBRA Bioregions (V6): **Southern Ranges**

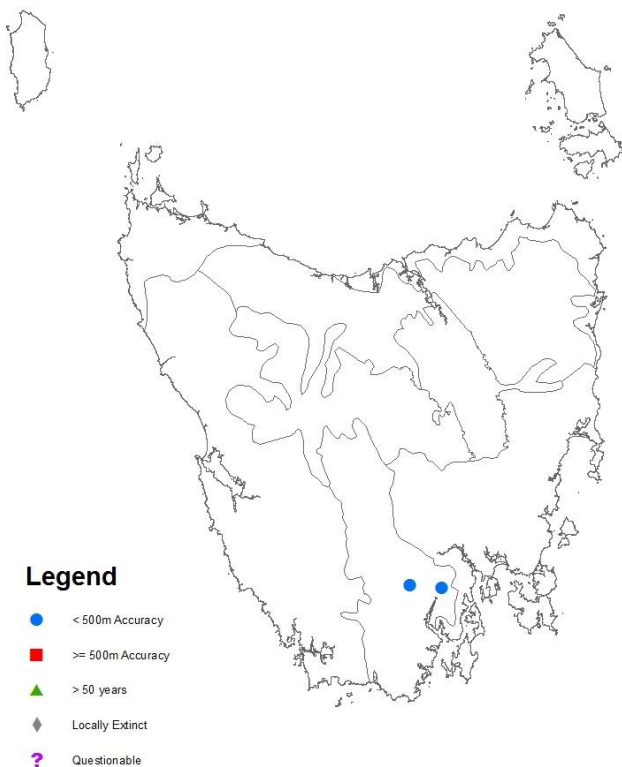


Figure 1. Distribution of *Thelymitra lucida* in Tasmania, showing IBRA bioregions (V6)



Plate 1. *Thelymitra lucida* from Lonnvale
(image by Peter Fehre)

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SUMMARY: *Thelymitra lucida* (glistening sun-orchid) is a deciduous terrestrial orchid known in Tasmania from two locations in the south of the State, with only two records, 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 individuals in total in Tasmania, putting the species at a high risk of local extinctions. The species grows in open forest and woodland with slightly impeded drainage. Likely threats to the known sites include losses through vegetation clearance or land management changes, competition from weeds, 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 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 lucida* has self-pollinating flowers that open tardily on hot days. 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 lucida* being one of 38 Tasmanian *Thelymitra* species (de Salas & Baker 2019), 11 of which are listed on Schedules of the Tasmanian *Threatened Species Protection Act 1995*.

The flowering of many sun-orchids is promoted by disturbance (Jones 2006). 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

Surveys for *Thelymitra lucida* should be undertaken during its peak flowering period, November and December, ideally in hot weather when its flowers are most likely to be open (Jeanes 2004, Jones 2006, Wapstra 2018). The two Tasmanian observations were made in November.

Description

Thelymitra lucida has a leaf that is 20 to 35 cm long and 5 to 12 mm wide. The leaf is linear, fleshy, and channelled. The green to purplish flower stems are 30 to 55 cm tall. The inflorescence usually consists of 1 to 7 flowers, which are 16 to 24 mm across, and dark blue. The often shortly pointed sepals and petals are 8 to 12 mm long and 4 to 7 mm wide. The column is 5 to 6 mm long and 2.5 to 3.5 mm wide and is blue to pinkish. The post-anther lobe (hooding the anthers) is 2.5 to 4 mm long, and 2 to 2.7 mm wide, tubular and inflated, the apex being deeply split into two lobes that are 1.2 to 1.6 mm long. It is dark purplish black with a yellow apex and the back surface is usually covered with a thin glistening bloom. The column arms are more or less straight and 1 to 1.5 mm long, with a toothbrush-like tuft of white or creamy yellow hairs that are 1 to 1.2 mm long.

[description based on Jeanes 2004, Jones 2006]

Confusing species

Thelymitra lucida is one of three *Thelymitra* species with the post-anther lobe often covered with a waxy or glistening bloom, the other species being *Thelymitra mucida* and *Thelymitra inflata*. It can be distinguished from *Thelymitra mucida* whose post-anther lobe shape is broadly v-notched and is narrowest at the base and widest towards the apex, and whose column arms have fewer, sparser and generally thicker,

Table 1. Population summary for *Thelymitra lucida* in Tasmania

	Subpopulation	Tenure	NRM region	1:25000 mapsheet	Year seen	Area occupied (ha)	Number of individuals
1	Huon Highway, Grove	road verge*	South	Longley	2001	unknown	unknown
2	Woolleys Road, Lonnale	private land	South	Lonnale	2012	unknown	unknown

*managed by the Department of State Growth

longer bright yellow hairs. It can be distinguished from *Thelymitra inflata* whose post-anther lobe is more inflated, and more deeply notched. It also usually grows in drier habitats and often flowers earlier than *Thelymitra lucida* (Jeanes 2004).

DISTRIBUTION AND HABITAT



Figure 2. Distribution of *Thelymitra lucida* (*Atlas of Living Australia*, downloaded 5/9/2018)

On mainland Australia, *Thelymitra lucida* occurs in Victoria (where it is listed on their Advisory List as endangered), and South Australia (Figure 2). In Tasmania, the species has been recorded from two locations in the south of the State, at Grove and near Lonnale (Figure 1, Table 1).

Thelymitra lucida grows in or near sedgy swamps on moist sandy or peaty soils, sometimes in standing water when in flower (Jeanes 2004). The Grove site occurs in heathy open forest/woodland on moist sandy loam. The Lonnale site is in sedgy/heathy (slashed) open eucalypt woodland.

POPULATION PARAMETERS

Estimates of relevant parameters used for the application of extinction risk criteria for *Thelymitra lucida* in Tasmania are shown below followed by justification of the estimates:

Number of subpopulations: <5 (2 known)

Number of locations: < 5 (2 known)

Extent of occurrence: < 5 km² (20 x 0.1 km)

Area of occupancy: < 1 ha

Area of occupancy (as per IUCN criteria): 8 km²

Number of mature individuals: < 250

Jeanes (2004) noted that *Thelymitra lucida* is extremely rare and seldom collected, perhaps a result of its highly localised distribution, tardiness in opening its flowers and likely short flowering period. 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). This presumption is based on follow-up surveys at least 10 times since the species was discovered at Grove in 2001 that failed to detect the species, despite the emergence of many other orchid species, including sun-orchids (Mark Wapstra pers. comm.).

Whilst *Thelymitra lucida* was only relatively recently described when the *Thelymitra pauciflora* complex was revised (Jeanes 2004), this is unlikely to have contributed to the paucity of records given that *Thelymitra lucida* was split from *Thelymitra mucida*, a species of interest given its listing as rare on State legislation since 1995. Also, *Thelymitra lucida* is distinctive because of its usually glistening bloom on a somewhat inflated post-anther lobe and as such is unlikely to have been overlooked.

Numerous surveys in potential habitat by orchid enthusiasts and impact assessment consultants have not resulted in the detection of new locations of *Thelymitra lucida* despite the detection of new locations, often significantly increasing the known range of many other *Thelymitra* species in recent decades.

The current status of both of the known sub-populations of *Thelymitra lucida* is uncertain suggesting that the species may be subject to a continuing decline. However, more data may be required to invoke a continuing decline for the formal assessment of extinction risk of the species.

The Grove subpopulation was reportedly from the edge of the Huon Highway, extending onto adjacent private land which has now had the understorey cleared and appears to no longer be suitable for the species. The road verge has been surveyed for *Thelymitra lucida* at least 10 times since the discovery of the species without success, and, while other sun orchids have emerged at the site since, the habitat has become denser over time and less conducive to emergence (Mark Wapstra pers. comm). As a result and considering the highly localised occurrences typical of the species, the total population is estimated to number fewer than 250 mature individuals and occupy less than 1 ha.

RESERVATION STATUS

Thelymitra lucida is not known from a formal reserve in Tasmania (Table 1).

CONSERVATION ASSESSMENT

Thelymitra lucida was listed as endangered in 2019 on Schedules of the Tasmanian *Threatened Species Protection Act 1995*, meeting the following criteria:

- D: Total population extremely small or area of occupancy restricted, and
1. total population estimated to number fewer than 250 mature individuals;
 2. total population with an area of occupancy less than 1 ha and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of

becoming extinct in a very short time period.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Thelymitra lucida is typically highly localised and within Tasmania has been recorded from just two 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 lucida* are discussed below:

Land clearing or changed management:

The extent of the Grove subpopulation has reportedly declined as a result of understorey clearing on private property (Mark Wapstra pers. comm.), and remaining habitat on the verge of the Huon Highway may be subject to degradation resulting from management of the road verge (e.g. extending the gravelled edge, drainage management). The apparently highly localised occurrences and short and spasmodic detection periods of *Thelymitra lucida* increase the risk of clearing or changed management practices in as yet undetected subpopulations and potential habitat.

Weeds: The Grove site occurs on a stretch of highway between Grove and Lower Longley along which a 1995 baseline survey found high densities of *Erica lusitanica*, blackberry, *Pinus radiata*, broom, thistles and dock, many of which proliferate in the sorts of moist sites that *Thelymitra lucida* inhabits. The species may be outcompeted by the weeds or suffer directly from weed management activities or indirectly by impacts of herbicides on its mycorrhizal fungi.

Inappropriate disturbance: *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 vegetation in the road verge at the Grove site has become

denser since discovery (Mark Wapstra pers. comm.). Slashing may be a preferred option to maintain habitat openness as the road verge site complicates the application of a favourable fire regime for *Thelymitra lucida*. Orchids at the Lonnvale site appear to have benefited from past clearing resulting in an orchid-rich sedgy/heathy vegetation maintained by slashing (Mark Wapstra pers. comm.). The results of Jasinge et al. (2018) suggest that it may be prudent to restrict planned burns in the habitat of *Thelymitra lucida* 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.

Climate change: The potential impact of climate change on *Thelymitra lucida* is difficult to quantify but it is likely that even minor shifts in average seasonal conditions may have an adverse impact on such a locally restricted species, 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.

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

Management objectives

The main objectives for the recovery of *Thelymitra lucida* are to relocate the species, prevent the loss or degradation of known subpopulations and potential habitat in their immediate vicinity, and increase the number of known subpopulations through survey.

What has been done?

The Grove site has been surveyed for *Thelymitra lucida* many times since the species was discovered.

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,
- ensure that roadside maintenance is compatible with the requirements of the species in the vicinity of the Grove subpopulation,
- include the Grove subpopulation as a priority site for monitoring and management in the Department of State Growth's Roadside Conservation Program,
- prevent the introduction and spread of weeds along the Huon Highway in the vicinity of the Grove subpopulation,
- determine the precise location of the Lonnvale site,
- conduct extension surveys radiating out from known sites,
- where possible, confirm the species identification of records of *Thelymitra mucida* and *Thelymitra holmesii* as some may belong to the more recently described *Thelymitra lucida*,
- 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,

- include the species in the next revision of the Recovery Plan for threatened Tasmanian orchids (Threatened Species Section 2017),
- collect seed for long-term conservation storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens.

REFERENCES

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View: www.naturalvaluesatlas.tas.gov.au
www.dpipwe.tas.gov.au/threatenedspecieslists
www.threatenedspecieslink.tas.gov.au/

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