

## THREATENED SPECIES LISTING STATEMENT

### Shy susan, *Tetratheca gunnii*

Hook.f. 1855



#### Status

Tasmanian *Threatened Species Protection Act 1995*

.....endangered

Commonwealth *Endangered Species Protection Act 1999*

.....Critically Endangered



Wendy Potts



#### Description

Shy susan is a perennial herb with a straggling growth habit. It typically has between one and five (sometimes more) slender branches which are 15 to 50 cm long and tend to trail through associated plants. The leaves are less than 5.5 mm long and the petals are pale lilac to deep pink, generally less than 5 mm in length. The fruit is a compressed capsule with two to three sections and a sparse cover of gland-tipped hairs.

Shy susan belongs to the family Tremandraceae. The main feature distinguishing *Tetratheca gunnii* from other *Tetratheca* species is the shape of the anther tube. The tube terminates at the widest point and is shorter than that of other species. The foliage and flowers of *Tetratheca gunnii* are generally smaller than those of other *Tetratheca* species.

#### Distribution and Habitat

Shy susan is endemic to Tasmania and is restricted to an area of less than 25 km<sup>2</sup> in the foothills of the Dazzler Range near Beaconsfield. While the species

occupies only about 0.6 ha, its habitat is serpentine outcrops which occupy only 530 ha in this region. Serpentine soils are internationally recognised for supporting high levels of endemism i.e. species restricted to a particular area (Proctor and Woodell 1971, Kruckeberg 1984). As serpentine is often restricted in area, its associated endemics are often rare. In this case, the serpentine substrate supports a unique community that is dominated by black peppermint (*Eucalyptus amygdalina*) and black gum (*Eucalyptus ovata*) over a heathy understorey. The understorey is a mosaic of tall heath dominated by dazzler heath (*Epacris virgata*), low heath dominated by guinea flower (*Hibbertia riparia*) and rosy myrtle (*Baeckea ramosissima*), but may also be grassy.

#### Important Locations

The entire extent of serpentine geology in the Beaconsfield area is important habitat for shy susan.

## Threats, Limiting Factors and Management Issues

The ecology of shy susan is not clearly understood. Consequently, the reasons for its decline and what degree of decline may constitute a threat are not clear. The species is susceptible to the root rot fungus *Phytophthora cinnamomi*. Two populations are known to be infected resulting in the death of more than 10% of individuals between 1994 and 1998. Due to the occurrence of rich mineral deposits, mining activity is the most likely carrier of the fungus into shy susan habitat. Exploration, testing and mining activities need to be, and currently are conducted under strict hygiene controls. Existing infections remain a threat and need to be controlled where possible.

The potential for vegetation clearance on private land represents a major threat to 40% of shy susan habitat. One population occurs in an area that was largely cleared of timber early this century. However, it is not possible to assess the impact on shy susan because the original distribution of the species in the area is unknown.

Inappropriate fire regimes are also considered a threat to shy susan. If fire is too infrequent, the heathy understorey may suppress the species, eventually causing a decline in numbers. The response of the species to differing fire intensities is unknown. If fire is a cause of decline, the very small population could equally be the result of an absence of fire or the incidence of infrequent very hot fires.

The sparse distribution of very few individuals may be causing problems with the breeding success of shy susan. The species needs to cross-pollinate to successfully produce seed. Where individuals are sparse and difficult to detect, their pollinators may not be able to find them to transfer pollen from one plant to another. Less than 30 seeds have been produced from more than 5,000 flowers between 1994 and 1998.

### Mineral exploration and mining

The very restricted distribution of shy susan on the serpentine outcrops in a mineral rich geological formation has the potential to cause conflict with mineral exploration and mining. It is important that all shy susan sites are clearly identified and no activities occur which could adversely affect the species.

### *Phytophthora cinnamomi*

Because of the potentially valuable geological deposits, over many years mineral exploration has occurred and the area is criss-crossed with tracks

and evidence of other exploration activities. This has promoted the spread of the root rot fungus, *Phytophthora cinnamomi* that occurs sporadically in the area. Shy susan is known to be susceptible to the pathogen and management initiatives must aim at preventing the spread of *Phytophthora cinnamomi* into the few areas which are disease free.

### Timber harvesting

Shy susan is a natural forest understorey species. Conservation of the species must aim at maintaining the forest overstorey in the long term.

### Reproductive failure

Failure of shy susan to set seeds is an issue which needs to be addressed. The small population size and further fragmentation of populations may inhibit sexual reproduction. Further declines may worsen the situation. Efforts to increase overall population sizes and densities may help native bees as pollinators to improve seed productivity. If increasing plant density proves successful, a planting program will be undertaken.

## Conservation Assessment

### Population Estimate

Shy Susan was considered extinct (Leigh *et al.* 1984) until its rediscovery in 1986 (Brown *et al.* 1986). A population census in 1994 noted a severe decline during the eight years. Only 100 plants are currently known to survive distributed among nine populations with the largest supporting 32 individuals and the smallest only one.

### Reservation Status

Less than half of shy susan habitat occurs in a forest reserve. Most of the remaining populations and individuals occur on private land.

### Assessment Criteria

Shy susan meets the criteria for listing as endangered on the Tasmanian *Threatened Species Protection Act 1995* because

- there are less than 250 mature individuals in total
- it is severely restricted, extending over an area of less than 500 square kilometres and occupying less than 10 hectares
- there is a continuing decline

It qualifies as Critically Endangered using the 1994 IUCN (World Conservation Union) Red List criteria.

## Recovery Program

### Objectives

- Control the threat posed by *Phytophthora cinnamomi*. The chemical phosphonate may be used to protect threatened populations. Before widespread application, the correct dose will be determined in glasshouse experiments and trialed in the field.
- Increase the rate of seed production. Cuttings have been taken from the entire population for use in experimental pollination biology. Plants propagated from these cuttings will be used in trials to determine whether increasing plant density increases pollination success. If the density trials prove successful, the rate of seed production should be increased.
- Supplementary plantings will be carried out in the field to enhance the rate of seed production and restore a soil seed bank.

### Existing Management

About 50% of shy susan habitat is currently reserved in the Dans Hill Forest Reserve and managed by Forestry Tasmania. Access to this reserve is limited and the area lies within a *Phytophthora cinnamomi* management zone in which strict hygiene controls are implemented.

Field based phosphonate trials are being undertaken and monitored by Forestry Tasmania.

The number of individuals and the annual flowering and seed production is being monitored.

### Recovery Program Criteria

- Halt the decline in numbers caused by *Phytophthora cinnamomi* and protect the currently occupied shy susan habitat through the application of phosphonate.
- Increase the number of individuals to more than 250 mature plants in the wild. Restore a self-sustaining population.
- A Recovery Plan is being prepared for Shy Susan.

### Actions Needed

- Land management plans and land management agreements should be developed between the Parks and Wildlife Service and private landholders.
- Test the germination response of seed to fire and smoke.
- A fire management plan should be designed and implemented for the Dans Hill Forest Reserve.
- Map and monitor the distribution of *Phytophthora cinnamomi*.

- Phosphonate should be applied to shy susan populations in danger of infection with *Phytophthora cinnamomi*. If *Phytophthora cinnamomi* is suspected to occur in an area or population, a bulked soil sample of about 1kg from near the base of infected plants should be sent to the Senior Pathologist at Forestry Tasmania for analysis.
- Test population translocation and enhancement methods using nursery propagated stock.
- Determine the identity of the species' pollinator.
- Determine the effect of increased plant density on pollination success.

### Further Information

**Contact details:** Threatened Species Unit, Department of Primary Industries, Water and Environment, GPO Box 44 Hobart Tasmania Australia 7001. Ph (03) 6233 6556 fax (03) 6233 3477.

**Specialist Advice:** Phil Barker, Threatened Species Unit, Department of Primary Industries, Water and Environment

### Source Material

#### References

Barker, P.C.J. 1996. *Extension surveys and long-term monitoring plots for selected species threatened by Phytophthora cinnamomi*. Forestry Tasmania and ANCA, Hobart.

Barker, P.C.J. 1996. *Selecting viable populations of Threatened plants for conservation management*. Forestry Tasmania and ANCA, Hobart.

Brown, M.J., Bayly-Stark, H.J., Duncan, F. and Gibson, N. 1986. *Tetratheca gunnii* Hook. F. on Serpentine soils near Beaconsfield, Tasmania. *Royal Society of Tasmania*, 120, 33-38.

Kruckeberg, A.R. 1984. *California Ultramafics: Flora, vegetation, Geology, Soils and Management Problems*. Univ. Cal. Press: Berkeley.

Leigh, J, Boden, R. and Briggs, J. 1984. *Extinct and endangered plants of Australia*. Macmillan: Melbourne.

Procter, J. and Woodell, R.J. 1975. The ecology of ultramafic soils. *Adv. Ecol. Research*. 9, 255-366.

**Statement Prepared:** September 1998

**Prepared by:** Phil Barker and Karen Johnson

**Review Date:** 2003 or as new information is received.

**Cite as:** Threatened Species Unit 1998. Listing Statement Shy susan *Tetratheca gunnii*. Department of Primary Industries, Water and Environment, Tasmania.

**View:** <http://www.dpiwe.tas.gov.au>

& follow the links to Natural Environment, Threatened Species, then List of Threatened Species.

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