

THREATENED SPECIES LISTING STATEMENT



Shy eyebright, *Euphrasia fragosa*

W.R.Barker 1996

Status

Tasmanian *Threatened Species Protection Act 1995*

.....Endangered

Commonwealth *Environment Protection and Biodiversity*

Conservation Act 1999.....Critically Endangered



Wendy Potts



Description

Shy eyebright is a short lived perennial herb surviving up to 1 to 3 years and is reliant on recruitment from seed. Populations may be transient and dependent on gap creating disturbance such as fire to stimulate germination of soil stored seed. Shy eyebright is difficult to find unless in flower. Peak flowering occurs in November to December but some flowers can generally be found at other times, particularly in autumn. The flowers are largely self-pollinated. Eyebrights are semi-parasitic, forming attachments to roots of surrounding vegetation.

Shy eyebright bears up to 10 slender, relatively fragile branches, occasionally more. Branching occurs above ground level and plants are generally no more than 25 to 30 cm in height. The leaves are

green, sometimes reddened in parts, and occur in opposite pairs with alternate pairs arising from the stem at right angles to each other. The leaves just below the first flower are about 5 to 10 mm long and 3 to 5 mm wide, with usually no more than 3 teeth on the distal half. The leaves appear semi-succulent and the underside has characteristic patches of glands typical of most eyebrights.

The branches terminate in an inflorescence consisting of up to about 10 pairs of flowers arranged similarly to the leaves. The flowers consist of a hood of two fused petals and a skirt of three fused petals. The petals are mauve, fading to white in the throat, with prominent deep purple lines extending from the throat and a yellow spot just beneath the anthers. Shy eyebright flowers are

relatively small and squat for Tasmanian eyebrights being about 9 mm long and 7 mm wide.

Shy eyebright belongs to the family Scrophulariaceae and is in the group of eyebrights with lined petals and which lack hairs about the point of attachment of the anthers. *Euphrasia fragosa* can be distinguished from *Euphrasia semipicta* by its smaller flowers. It can be distinguished from *Euphrasia striata* by branching above ground level and its smaller flowers and lowland habitat. The species was known as

Euphrasia sp. 'Southport' prior to its formal description in 1996.

Distribution and Habitat

Shy eyebright is endemic to Tasmania and the three known populations at Southport and Bruny Island are separated by the port of Southport and the D'Entrecasteaux Channel. The populations extend over an area of 20.5 square kilometres and occupy a total of only 0.11 hectares. Shy eyebright is a lowland eyebright, found in coastal areas in heathy, grassy or sedgy open woodland or at the forest edge.

Important Locations

Locality	1:25,000 mapsheet	Year last seen	Area (ha)	Number of mature plants
Lady Bay Road to Rossel Point –2 sites Private land near Southport	Partridge	1999	0.08	100 (200 seen in good year)
Mt Bleak, Labillardiere Peninsula South Bruny National Park	Partridge	2001	0.034	30 (220 seen in good year)
Southport Lagoon Southport Lagoon Conservation Area	Leprena	1999	0.0004	up to 14

Threats, Limiting Factors and Management Issues

Shy eyebright, being a relatively short-lived species (1 to 3 years), is reliant on recruitment from seed for population persistence. Due to a requirement for light for germination, recruitment from seed is dependent on open habitat with patches of bare ground. It also requires relatively high moisture levels in spring to allow seedlings to establish and form parasitic root attachments with surrounding vegetation. Unless in very exposed areas, openness in lowland eyebright habitats is generally dependent on disturbance such as fire or vehicle or animal tracks. Such disturbance dependent species are prone to large fluctuations in numbers due to fluctuations in openness in their habitat. Populations can be transient surviving only as seed in the soil. However, when confined to the soil seed bank, species have an increased risk of extinction as they rely on conditions suitable for germination as well as conditions favourable for seedling survival. Soil stored seed may require specific germination cues compared with freshly shed seed and it is possible that new populations will emerge after fire.

The main population near Southport occurs in two main patches on private land. It is found along 4WD or cattle tracks in very open woodland with a heathy/grassy understorey. The area has been subdivided and is for sale. The population is at risk of a change in land use likely once the blocks have sold. The grazing regime to date has been light but

sufficient to allow population persistence by maintaining openness.

The Mt Bleak population was first discovered in 1986 and as the surrounding vegetation has become denser, the population has now become restricted to the wheel ruts of a 4WD/walking track. It was found in 3 patches along the track but has since become restricted to the larger wetter patch on the southeastern slope. The track in this patch was bypassed in 1999 to avoid losses from trampling and 4WD activity. This was deemed necessary as the track is used by vehicles for search and rescue purposes and policing of poachers, and foot traffic has increased with the recent proclamation of the area as a National Park. However, in order to maintain the population, openness will need to be controlled. Despite a decrease in plant numbers due to the extreme dry conditions in the previous two summers, seedlings have established in small patches that were slashed near seed producing plants. The patches were kept small (approximately 30 x 50 cm) as larger patches would tend to dry out and increase grazing pressure from native animals.

The small population near Southport Lagoon occurs in a frequently burnt area. It has declined despite the habitat not becoming overgrown and has not been seen since early 1999 despite monitoring. The decline may be due to dry conditions, particularly in the last 2 years. Conditions that are required for the establishment of the population from soil stored seed are currently being investigated.

Reports of eyebrights near Cape Bruny (David Ziegeler, Greg Jordan pers. comm.) are likely to be this species. However the reports have not been able to be confirmed despite searches at flowering time. Areas near Cape Bruny were fired frequently until the early 1990s and the eyebrights may reappear following fire.

With few populations in a restricted area and a reliance on high moisture levels for seedling establishment, the species is at risk of becoming extinct if current climate change trends (warmer and drier summers) continue.

Conservation Assessment

Population Estimate

There are only three known shy eyebright populations despite dedicated surveys at flowering time when plants are relatively easy to find. Reports of eyebrights, likely to belong to this species, near Cape Bruny have not been verified despite searches and they may not reappear until after the area is burnt. The small population at Southport Lagoon had 14 flowering plants in 1996 but no plants have emerged since early 1999. The larger Southport and Mt Bleak populations appear to have been relatively steady in numbers of mature individuals (about 100 and about 30 respectively) until the high rainfall in the spring and summer of 1995/1996 which resulted in a large increase (to 200 and 220 respectively). The increase in numbers was due to improved seedling survival rates but the range of the population did not change. Numbers have declined since, demonstrating the large fluctuations in numbers exhibited in populations from year to year. Preliminary results indicate that the number of seedlings at Mt Bleak has increased due to the slashing of small patches to increase habitat openness near flowering plants.

Reservation Status

Shy eyebright occurs in the South Bruny National Park. It is also afforded some protection by occurring in the Southport Lagoon Conservation Area.

Assessment Criteria

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

- there are typically 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
- it occurs in 5 or less populations
- there is a continuing decline

- there are extreme fluctuations in the number of mature individuals

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

Recovery Program

Objectives

- prevent the loss or degradation of known populations
- increase numbers through habitat management and survey

Existing Management

Shy eyebright is included in the Recovery Plan for threatened Tasmanian lowland *Euphrasia* species. Implementation of the plan commenced in 1997 and dedicated surveys for the species have been made. Populations have been monitored regularly and small scale slashing is being used on Mt Bleak in the vicinity of seed producing plants in an attempt to increase population size. Draft management plans have been prepared for the South Bruny National Park and the Southport Lagoon Conservation Area.

Actions Needed

- verify reports of populations and search suitable areas for new populations, particularly in recently burnt areas
- continue slashing of small patches near flowering plants to promote the recruitment of seedlings on Mt Bleak
- further investigate fire ecology and consider a trial burn at Mt Bleak in order to extend the range of the population beyond the wheel ruts of the track
- provide management advice to new landowners/managers should blocks on which the Southport population occurs be sold
- monitor known populations for threats, declines and results of habitat management actions
- establish a mechanism to ensure management intervention when required

Information Needed

- determine whether there are any more populations in existence
- investigate the role of fire in stimulating germination from soil stored seed

Management Advice

For the land owner/land manager

- if possible, maintain light cattle grazing pressure

- consider burning if vegetation is becoming overgrown, taking care to allow plants to seed before taking action
- continue slashing small patches near flowering plants to encourage recruitment from seed
- consider some form of long-term protection, e.g. private nature reserve, management agreement, covenant, etc

For everyone

- search for new populations in November to December when the plants are in full flower, particularly in recently burnt areas
- help us to monitor known populations, particularly at flowering time

Further Information

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Source Material

References

Barker, W.R. 1982. Taxonomic studies in *Euphrasia* L. (Scrophulariaceae). A revised infrageneric classification, and a revision of the genus in Australia *J. Adelaide Bot. Gard.* 5:1-304.

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Potts, W.C. 1997. *The conservation biology of threatened lowland Euphrasia taxa in south-eastern Tasmania.* Report to Environment Australia for Endangered Species Unit Project number 428. Parks and Wildlife Service, Department of Environment and Land Management, Hobart.

Potts, W.C. 2000. *Recovery Plan for Threatened Tasmanian Lowland Euphrasia Species.* Department of Primary Industries, Water and Environment, Hobart.

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