

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this Conservation Advice on 01/04/2016.

Conservation Advice

Euphrasia eichleri

Bogong eyebright

Conservation Status

Euphrasia eichleri (Bogong eyebright) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as prior to the commencement of the EPBC Act, it was listed as Vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factors causing the subspecies to be eligible for listing in the Vulnerable category are its limited number of mature individuals (< 10 000) and its limited geographic distribution which is precarious for its survival based on the number of mature individuals in each subpopulation (< 1000).

The Bogong eyebright is listed as threatened under the *Victorian Flora and Fauna Guarantee Act 1988* and as Vulnerable under the non-statutory Advisory List of Rare or Threatened Plants in Victoria.

Description

The Bogong eyebright is a perennial, semi-parasitic herb growing to about 15 cm tall. Dense glandular hairs are present on branches, leaves, rachis, bracts and calyces. Leaves are broadly oblong or wedge-shaped, to about 16 mm x 7 mm, the margins exhibiting several pairs of long, narrow teeth. Flowers appear in summer and are tubular, to 15 mm wide, white or very pale purple with 3–5 fine purple stripes and yellow markings on lower lobes. Fruit is an ovoid capsule that is densely bristly in apical parts (Barker 1982; Walsh & Entwisle 1999). There have been no specific biological or ecological studies of the Bogong eyebright. The abundance of flowering plants may vary greatly between years (Carter & Walsh 2006).

Distribution

The Bogong eyebright is endemic to the alps of eastern Victoria. It is restricted to alpine and subalpine vegetation between the Bogong High Plains and Mt Bogong, and on the Dargo High Plains, from 1600–1860 m altitude (Walsh & Entwisle 1999), in the Australian Alps IBRA Bioregion (DEH 2000).

In 1998, 1134 plants in seven populations were found, at the following locations within the Alpine National Park (Carter & Walsh 2006):

- Cope Creek: 272 plants
- Cope Saddle Road: 114 plants
- Mt Nelse North – Nelse Saddle: 151 plants
- Mt Nelse South: 80 plants
- Upper Watchbed Creek: 29 plants

- Watchbed Creek: 467 plants
- Whiterock Creek: 21 plants

These populations are considered as 'important populations' for the long term survival of the species (DSE 2009).

Searches by N. Walsh in 2002 at all seven sites found no plants (Carter & Walsh 2006). However, monitoring by the former Victorian Government Department of Sustainability and Environment in February 2004 after the 2003 bushfires recorded 14 populations (DSE 2009). It is unclear whether this includes all populations listed above. Three populations were unburnt and 11 populations were burnt. Two populations were identified on Big River Fire Track, with each population containing approximately 100 plants. A population of approximately 200 plants at Quarz Ridge, Mt Bogong is considered an 'important population' (DSE 2009). All populations were considered small but regenerating well (Coates et al., 2004). Abundance prior to 1998 is not known (Carter & Walsh 2006).

Relevant Biology/Ecology

In Australia, the genus *Euphrasia* occurs frequently in environments where light levels are very high (Potts 1999).

The Bogong eyebright occurs in low open heath, grassland and *Sphagnum* bogs (Walsh & Entwisle 1999). Associated species include mountain woodruff (*Asperula gunnii*), alpine starbush (*Asterolasia trymalioides*), short-stem sedge (*Carex breviculmis*), *Celmisia asteliifolia* spp. agg., *Deyeuxia brachyathera*, spreading rope rush (*Empodisma minus*), burgan (*Kunzea ericoides*), scaly buttons (*Leptorhynchus squamatus*), *Leucopogon montanus*, *Luzula modesta*, Australian caraway (*Oreomyrrhis eriopoda*), carpet heath (*Pentachondra pumila*), *Pimelea alpina*, bog snow-grass (*Poa costiniana*), soft snowgrass (*Poa hiemata*), *Podolepis robusta*, *Ranunculus victoriensis* and *Trachymene humilis*. The Bogong eyebright has also been recorded from low open shrubland dominated by alpine orites (*Orites lancifolia*) (Barker 1982).

The effect of fire on alpine and subalpine *Euphrasia* species including Bogong eyebright is unknown (Carter & Walsh 2006; DSE 2009).

Threats

Table 1 – Threats impacting the Bogong eyebright in order of severity of risk, based on available evidence.

Threat factor	Threat type	Threat status	Evidence base
Fire			
Altered fire frequency / intensity	potential	current	In 2003, 11 populations were impacted by bushfires (DSE 2009). In 2004, all 11 populations were regenerating but noted as small (Coates et al., 2004). The threat of fire is inferred as the long term effect of fire on the species is unknown (Carter & Walsh 2006; DSE 2009).
Invasive species (including threats from grazing, trampling, predation)			
Grazing by	known	past	Grazing by cattle historically threatened the

cattle			species, particularly populations at Cope Creek and Cope Saddle Road. Grazing is currently excluded from the Alpine National Park (Carter & Walsh 2006).
Climate change			
Increased temperature and altered precipitation	potential	future	<i>Euphrasia</i> species may tolerate interannual climatic variation (J Morgan pers. comm. 2016) such as drought (DSE 2009). However, the long term capacity of <i>Euphrasia</i> species to tolerate and/or adapt to climatic factors such as increased temperature, altered precipitation and altered seasonality is unknown. Climate change is an inferred threat for Bogong eyebright (Carter & Walsh 2006; DSE 2009).

Conservation Actions

Conservation and Management priorities

Fire

- Develop an appropriate fire management regime for protection of key habitat including buffers to prevent wildfire or managed fire from impacting populations.
- Provide maps of population sites to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plan/s, risk register and/or operation maps.

Breeding, propagation and other *ex situ* conservation action

- Maintain the seed stored in the Victorian Conservation Seedbank.
- Develop effective propagation and cultivation techniques for an *ex situ* cultivation program.
- Establish cultivated plants *ex situ* for inclusion in living collections, to safeguard against any unforeseen destruction of wild populations.

Stakeholder Engagement

- Liaise with the Victorian Government Department of Environment, Land, Water and Planning (formerly the Department of Sustainability and Environment), Parks Victoria and the Royal Botanic Gardens.
- Erect appropriate conservation signs to educate the public about the species.
- Encourage formal links with local naturalist groups and interested individuals.

Survey and Monitoring priorities

- Design and implement a monitoring program or, if appropriate, support and enhance existing programs to more precisely assess population size, distribution, population structure, and recruitment.

- Monitor the progress of recovery, including the effectiveness of management actions and adapt them if and when necessary.
- Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/remnants.

Information and research priorities

- Investigate options for linking, enhancing or establishing additional populations.
- Undertake research to identify stimuli for recruitment and regeneration.
- Identify the effect of disturbance regimes on the species, in particular the effect of varying fire frequency and intensity.
- Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment.

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