

# THREATENED SPECIES SCIENTIFIC COMMITTEE

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

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The Minister's delegate approved this conservation advice on 01/10/2015

## Conservation Advice *Gentiana baeuerlenii*

Baeuerlen's gentian

### Conservation Status

*Gentiana baeuerlenii* (Baeuerlen's gentian) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as Endangered as, prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factors that are the cause of the species being eligible for listing in the Endangered category are its small population size with a very low total number of mature individuals, and restricted area of occupancy.

### Description

Baeuerlen's gentian is an annual herb less than 4 cm tall, usually with several stems branching from near the base of the plant (OEH, 2012). The species is autumn-flowering (March-April) (Adams, 1996) with 1-3 flowers per plant (NSW NPWS, 2001). Single, small, bell-shaped flowers, green on the outside and pale-blue inside, are produced at the ends of the stems (OEH, 2012). The germination requirements for the species are poorly known (Environment ACT, 2004).

### Distribution

Baeuerlen's gentian is currently known from one location, in the Orroral Valley, Namadgi National Park, ACT. It was rediscovered by chance after it was believed to be extinct, having previously been described from the Quedong area near Bombala NSW, from specimens found there in 1887. When found in the Orroral Valley in 1991, the site contained 20 plants. It was resurveyed in 1994 (11 plants), 1997 (one plant), and 1998 (four plants). Annual surveys since 1998 have failed to locate any plants (Environment ACT, 2004).

The species occurs in the inter-tussock space of moist tussock grassland and sedgeland (*Poa labillardieri* and *Carex gaudichaudii*) associated with ground water, possibly spring-fed. The area is probably a relict grassland opening once surrounded by open woodland. The site is on the lower slopes of a broad valley, above a river and lower valley floor (Environment ACT, 2004).

Given the general remoteness of the area where the species has been collected and the diminutive habitat of this easily overlooked plant, it is possible that the species is still extant and suitable habitat should continue to be surveyed for the species (Adams and Williams, 1988).

The habitat requirements and the disturbance regime that would underpin the persistence of this herb are poorly known.

The orchid, *Spiranthes sinensis*, the herb, *Ranunculus pimpinellifolius* and the grass *Hemarthria uncinata* were found in association with Baeuerlen's gentian and this group of more widespread species may be indicators for other potential sites (Environment ACT, 2004).

### Threats

Baeuerlen's gentian is very small in stature and requires an open habitat for its survival. Baeuerlen's gentian may have been more widespread than documented historically and suitable habitat was lost through land clearing, pasture improvement and grazing, particularly in times of

drought. Its habitat may also have been trampled, especially when adjoining areas dried out (ACT Government, 1997).

The main threats to the survival of this species include modification of habitat that results in change to vegetation cover and competition. This may include change in grazing regime, pasture improvement (including fertiliser application) within catchments, invasion of competing and smothering plants such as large tussock species (eg serrated tussock (*Nassella trichotoma*)), and change to hydrology and moisture levels.

Other threats include inappropriate weed management including herbicide use (NSW NPWS, 2001); and damage to the soil caused by pigs through rooting for food. It is not clear whether grazing animals such as kangaroos may also pose a threat to the survival of any remaining plants, or whether such grazing may benefit the species by keeping competing grass tussocks and other plant growth short and open (Environment ACT, 2004).

Climate change and the resulting reductions in rainfall during recent years, particularly in autumn and winter, in the areas where this species has been recorded is likely to have had an adverse impact on this species which is dependent on seepage areas remaining moist (OEH, 2012).

The Orroral Valley site was fenced in 2002 to minimise feral pig (*Sus scrofa*) damage. The fence has been considered to be effective for pig management, as pigs have never been discovered within the fence. Annual feral pig control is undertaken in the whole of Namadgi National Park including Orroral Valley (Kitchin, 2010). Grass has grown across the site and a burn in the area is being considered in adjacent areas of similar habitat (ESDD, 2013; Kitchin, 2010), however, there is a lack of fire ecology research for the species (Department of the Environment, 2015).

Given that the species has not been found at the Orroral Valley site for some years, an evaluation of the most appropriate management regime for the site may need to be undertaken, with a view to providing the species with the optimum chance to re-emerge and if so, recover.

## **Conservation and Management Actions**

### Survey and monitoring

- Monitor the site of the known population of Baeuerlen's gentian in the Orroral Valley on an annual basis (Environment ACT, 2004) to determine the presence of the species. If the species is found, investigate and put into place the most appropriate actions necessary for the conservation and recovery of the species.
- Surveys for Baeuerlen's gentian should continue to be undertaken in suitable habitats (bog margins) on the southern tablelands of NSW and the ACT. If the species re-emerges, ex situ conservation and an in situ threat assessment should be undertaken (Department of the Environment, 2015).

### Information and research priorities

- Investigate the habitat conditions of other *Gentiana* species (eg *G. bredboensis* and *G. wingecarribiensis*) and their management for conservation and recovery, and consider lessons that can be learned from those in developing optimum management regimes for this species. This could include consideration of appropriate fire management.
- Depending on the extent of regeneration of the species if it re-emerges, investigate options for conservation of genetic variation. This could include researching genetic diversity and reproduction requirements to maximise genetic variation during flowering and pollination events.
- Using opportunities from any extant populations of the species and its congeners, research the species' germination biology and responses to fire, herbivore activity and cover of other groundlayer vegetation to ensure that disturbance and grazing regimes are managed appropriately for the species.

### Habitat loss disturbance and modifications

- Using information from above, manage the Orroral Valley site to maintain appropriate sward structure. This may include trimming of the tussock grass during the non-flowering season and

removal of cut grass by raking, to avoid build-up of plant litter too thick for growth and regeneration of Baeuerlen's gentian (Environment ACT, 2004).

- Avoidance of the use of herbicide, both within and in the vicinity of the Orroral Valley site, where there is any possibility of it affecting the species (Environment ACT, 2004).
- Ensuring that activities which could alter drainage, such as track development, are not allowed near the Orroral Valley site (Environment ACT, 2004).

#### Invasive species (including threats from grazing, trampling, predation)

- Check the Orroral Valley site for invasive weeds (eg serrated tussock (*Nassella trichotoma*)) on an appropriately regular basis and remove as necessary, using methods that are non-detrimental to Baeuerlen's gentian.
- Control feral pigs within, and in the vicinity of the Orroral Valley through an annual baiting program (Kitchin, 2010).
- Ensure ongoing maintenance of the pig exclusion fence continues, subject to an evaluation of the most appropriate management regime for the species.

#### **Stakeholder Management**

- Ensure that field workers, interested naturalists and conservation groups are aware of the presence of the species to increase the potential that any other existing populations are identified (Environment ACT, 2004) in the vicinity, and adapt actions as necessary if the species is found.
- Liaise with the relevant NSW state government agency regarding the potential presence of Baeuerlen's gentian in that state (Environment ACT, 2004), and adapt actions as necessary if the species is found.

#### **References cited in the advice**

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