

Nature Conservation (Baeuerlen's Gentian) Conservation Advice 2026

Notifiable instrument NI2026–460

made under the

Nature Conservation Act 2014, s 90C (Conservation advice)

1 Name of instrument

This instrument is the *Nature Conservation (Baeuerlen's Gentian) Conservation Advice 2026*.

2 Commencement

This instrument commences on the day after its notification day.

3 Conservation advice for Baeuerlen's Gentian

Schedule 1 sets out the conservation advice for the Baeuerlen's Gentian (*Gentiana baeuerlenii*).

4 Revocation

This instrument revokes the *Nature Conservation (Baeuerlen's Gentian) Conservation Advice 2019* (NI2019-708).

Simon Clulow
Chair, Scientific Committee
7 October 2026

Schedule 1

(see s 3)

CONSERVATION ADVICE

BAEUERLEN'S GENTIAN

Gentiana baeuerlenii

CONSERVATION STATUS

Baeuerlen's Gentian *Gentiana baeuerlenii* L.G.Adams, is recognised as threatened in the following jurisdictions:

National	Critically Endangered , <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ACT	Critically Endangered , <i>Nature Conservation Act 2014</i>
NSW	Endangered , <i>Biodiversity Conservation Act 2016</i>

ELIGIBILITY

Baeuerlen's Gentian is listed as Critically Endangered in the ACT Threatened Native Species List under IUCN Criterion B – B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v), Criterion C – C2a(i) and Criterion D – D1. The factors that make the Baeuerlen's Gentian eligible for listing are: the species' geographic distribution and number of locations are very restricted, the species is severely fragmented and continuing decline is observed and inferred in Extent of Occurrence (EOO), Area of Occupancy (AOO), area, extent and quality of habitat, number of locations and populations, and number of mature individuals (0–20) (DCCEEW 2026). Baeuerlen's Gentian is not currently known to be extant at any sites where the species was previously recorded. Although there are no known surviving individuals, the limited detectability of the species suggests it may be premature to infer extinction (Wilkins & Keith 2019) and further survey effort is needed to determine if the species is still extant.

DESCRIPTION AND ECOLOGY

Baeuerlen's Gentian is a small annual herb, standing 2–4 cm high. Each plant has 1–3 bell-shaped flowers that are greenish outside and blue-white inside (Flora and Fauna Committee 1996).

The ACT population has been recorded as flowering between autumn and early winter (March–June) and it appears to be an annual, dependent on seed regeneration (Act Government 2017).

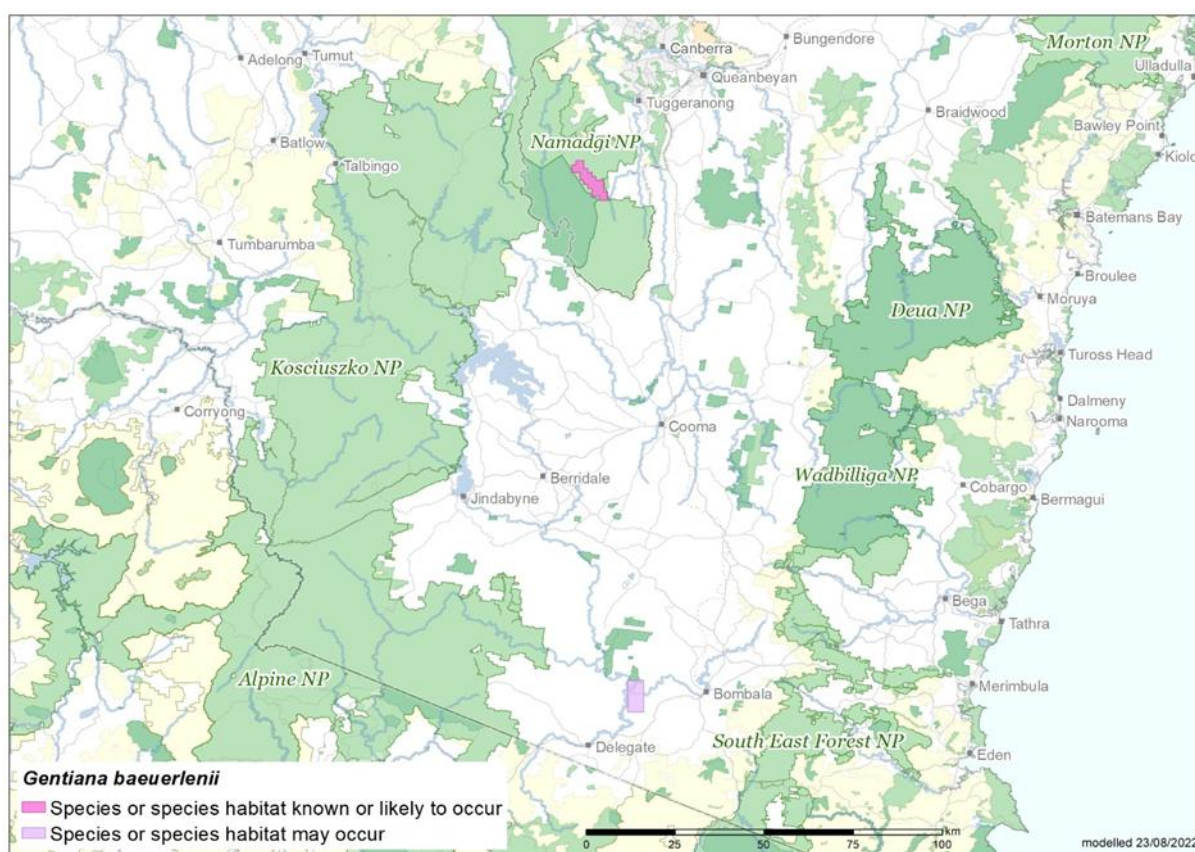


Baeuerlen's Gentian (ACT Government)

DISTRIBUTION AND HABITAT

Baeuerlen's Gentian was described from specimens found near Bombala (NSW) in 1887 where it is no longer extant. It was not observed again until 1991 when 20 plants were accidentally discovered in a moist grassland in the Orroral Valley (Namadgi National Park) reducing to less than 10 plants in 1994 (Flora and Fauna Committee 1996). This reduced to four plants in 1998, with annual surveys unsuccessful in locating any plants since then. This site was burnt in the bushfires in 2003 and the fire was severe in parts of the habitat and penetrated into the peat, which may have impacted any seeds in the soil seed bank (ACT Government 2017). The site was also burnt in the bushfires in 2019–20 and surveys in May 2020 found no plants even though there was initial recovery of much of the ground cover (J Seddon 2022. pers comm 19 July). Comparable sites with similar habitat nearby were also searched at this time, along with other swamps in the Southern Tablelands, but no plants were found (D Keith 2022. pers comm 15 July). Annual surveys from 2021 and 2024 also found no plants (F Grant 2022. pers comm 15 July 2022; E. Cook 2026. per comm 2 March), so the species has not been seen since 1998 (28 years). The known areas of historic habitat for the species are shown in Map 1.

Map 1: Modelled distribution of *Gentiana baeuerlenii*



Source: Base map Geoscience Australia; species distribution data [Species of National Environmental Significance](#) database.

The species occurs in the inter-tussock space of moist tussock grassland and sedgeland (*Poa labillardieri* and *Carex gaudichaudii*), possibly spring-fed. The site is on the lower slopes of a broad valley above a river and it is very unlikely the species exists anywhere else in the ACT (ACT Government 2017).

THREATS

The main identified threats in the ACT action plan (ACT Government 2017) include:

- unintended park management actions

- feral pig rooting
- insufficient understanding of species competition, grazing, trampling and fire.

Climate change and the resulting decreased rainfall in recent years, particularly in autumn and winter, may adversely impact this species as it is dependent on seepage areas remaining moist (OEH 2019). Also, increased frequency of extreme temperatures, droughts and fire danger weather, and changes in precipitation may have catastrophic consequences (DCCEEW 2026).

MAJOR CONSERVATION OBJECTIVES

The overall objective of the action plan (ACT Government 2017) is to preserve Baeuerlen's Gentian in perpetuity in the wild across its natural geographic range in the ACT including the need to maintain natural evolutionary processes.

CONSERVATION PRIORITIES

The ACT is likely to contain the only remaining site of Baeuerlen's Gentian and its conservation is critical to the survival of the species. Due to the cryptic nature of this species and the small size of the site, management actions are directed towards maintaining existing conditions and ensuring activities located nearby do not adversely affect the site. Conservation actions identified in the ACT action plan (ACT Government 2017) include:

- protect the site in Namadgi National Park
- manage habitat to maintain suitability for the species (e.g., exclude disturbance by pigs)
- monitor site and effects of management actions
- manage adjacent grassland to facilitate expansion of populations.
- develop an *ex-situ* seed bank and/or tissue culture if the species can be found and germination occurs at suitable numbers
- research ecology, habitat and threats.

Future priorities identified in the 5-year report on the Action Plan (ACT Government 2024), in collaboration with the NSW NPWS and in the Commonwealth Conservation Advice (DCCEEW 2026) include to:

- develop a landscape-scale potential habitat map for the southern tablelands between ACT and the NSW "Quidong" property based on the habitat description (species composition, soils, topography, elevation, climatic features (Keith et al. 2018) and the location of springs) to identify areas suitable for further field search and surveys
- continue to undertake targeted surveys during flowering season in the Orroral Valley and potentially in the areas identified as suitable habitat for this species including Scabby Range Nature Reserve and Tantangara Reservoir as candidate locations (DCCEEW 2026)
- improve understanding of its population dynamics, ecology and specific habitat requirements to support management for conservation, if the species is rediscovered (Keith et al. 2018)
- continue to control feral pigs in Namadgi National Park
- undertake ecological restoration at the Orroral Valley site with the specific objectives to improve habitat quality and provide opportunities for *G. baeuerlenii* recruitment from seed (assuming a viable soil seedbank exists), building on past experience of land managers and ecologists at these sites (restoration should involve the development of a detailed project plan that includes monitoring and evaluation with key considerations for treatments such as erosion control and measures to improve local hydrology to maintain key structural dominants, weed and herbivore management)

- support research on the relationship between *G. baeuerlenii* and *G. bredboensis* to resolve taxonomic uncertainty
- collect seed and propagation of *G. bredboensis* if genetic studies show no genetic differentiation between *G. baeuerlenii* and *G. bredboensis*, conduct research into the life history and ecology of the species, if plants are found, including understanding the role of mycorrhiza as possible agents for germination/plant development, including determining seed bank longevity, factors controlling seed germination, pollinators, recruitment and seed dispersal.

CONSERVATION ISSUES

It is recommended that quantitative targets and resourcing requirements are clearly identified in any Action Plan or other related projects/programs relevant to this species. Broader conservation issues need to be considered in developing and implementing actions arising from this advice and the listing assessment (DCCEEW 2026).

Critical Habitat

The Commonwealth Conservation Advice (DCCEEW 2026) identifies that *Gentiana baeuerlenii* has historically been found in the Namadgi National Park, ACT and the Quidong area near Bombala, NSW. Due to the small geographic distribution, habitat critical to the survival of the species includes the area of occupancy of the species including any areas where the species was previously known to occur or is found to occur in the future, areas of similar habitat surrounding these populations (as these areas provide potential habitat for pollinators or biota essential to the continued existence of the species and enables the movement of pollinators between localities), and the local catchment for the surface/groundwater that maintains the habitat of the taxon and any areas of similar habitat (defined as moist tussock grassland and sedgeland) in areas where the species is likely to occur or may occur (pink areas in Map 1) may be habitat critical to the survival of the species, and surveys should be conducted to determine if the species is present. Any surveys for the species should be conducted in autumn and take into account the likelihood of detecting the species given its cryptic nature.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat under the EPBC Act.

Climate Change

Climate change impacts are inevitable and will affect the likelihood of persistence, within the ACT, of many species. Amongst the most vulnerable in this regard are those species that occupy highly fragmented habitat with highly restricted distributions, such as the Baeuerlen's Gentian. Capacity must be developed to model the impact on the Baeuerlen's Gentian and its habitat under likely climate change scenarios if we are to anticipate and manage the impacts of climate change. This will require a combination of research and the development of in-house capacity for the collection of relevant data and its application in climate change modelling.

Population Viability

With a threatened species, such as the Baeuerlen's Gentian, the question often raised is whether the species is viable into the future. That is, have the populations declined in abundance and become fragmented to such an extent and has the genetic diversity of the species declined to such an extent that the species no longer has the capacity to rebound should conditions improve or to respond to management intervention. Such an assessment may need to be made in the case of the Baeuerlen's Gentian if it is found, and if it is determined that the species is not viable, to explore more intensive options for bringing the species to a position where it has the potential to recover.

Jurisdictional Collaboration

The location of the species habitat in Namadgi National Park and in south-eastern NSW requires the development of any policies and action/recovery plans to be discussed between relevant jurisdictional entities.

Ngunnawal Community Engagement

The ACT Government should actively facilitate, the inclusion of the Ngunnawal people in the conservation of this species and its habitat as part of Ngunnawal Country. Reference to the draft Cultural Resource Management Plan (ACT Government in prep.) would be useful to inform culturally appropriate resource management including of native species that aligns with achieving conservation outcomes for the species.

OTHER RELEVANT ADVICE, PLANS OR PRESCRIPTIONS

- ACT Native Grassland Conservation Strategy (ACT Government 2017)
- Commonwealth Conservation Advice — Baeuerlen's Gentian (DCCEEW 2026)
- Conservator Translocation Guidelines (ACT Government 2018)

LISTING BACKGROUND

The Baeuerlen's Gentian was listed in the ACT as an Endangered species on 15 April 1996 in accordance with section 21 of the *Nature Conservation Act 1980*. At that time, the Flora and Fauna Committee (now the Scientific Committee) concluded that the assessment satisfied the following criteria:

- 1.1 Species is known or suspected to occur in the ACT region and is already recognised as endangered or presumed extinct in an authoritative international or national listing.
- 1.2 Species is observed, estimated, inferred or suspected to be at risk of premature extinction in the ACT region in the near future, as demonstrated by:
 - 1.2.6 Extremely small population.

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

The species was reassessed and listed as Critically Endangered under the EPBC Act on 6 February 2026. In response, the ACT Scientific Committee recommended the Baeuerlen's Gentian be transferred to the Critically Endangered category in the ACT Threatened Native Species List under the *Nature Conservation Act 2014*, to align with the EPBC Act listing.

ACTION PLAN DECISION

The ACT Scientific Committee recommends that the Minister for the Environment should make the decision to continue the current action plan (ACT Government 2017a) for the species in the ACT under the *Nature Conservation Act 2014*.

All known habitat on ACT-owned land is within Namadgi National Park. A national recovery plan is not required for the species as the Commonwealth Conservation Advice for the species will guide priority conservation actions, mitigate against key threats, enable potential recovery and provide a foundation for further planning (DCCEEW 2026) through well-established existing mechanisms between the NSW and the ACT governments.

REFERENCES

- ACT Government 2017. *ACT Native Grassland Conservation Strategy and Action Plans*. ACT Government, Canberra. <https://www.legislation.act.gov.au/View/di/2017-288/current/PDF/2017-288.PDF>
- ACT Government 2018. *Nature Conservation (Translocation of Native Flora and Fauna) Conservator Guidelines*. Department of Environment, Planning and Sustainable Development, Canberra. <https://www.legislation.act.gov.au/ni/2017-650/>
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- Canberra.naturemapr.org (CNM) 2019. *Canberra Nature Map*. Accessed 14 August 2019 from: <https://canberra.naturemapr.org/Community/Species/Sightings/3294?ViewMode=Detail>
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- Environment ACT 2004. *Recovery Plan for a sub-alpine herb (Gentiana baeuerlenii)*. Environment ACT, Canberra.
- Flora and Fauna Committee 1996. *Recommendation for Declaration of an Endangered Species – Gentiana baeuerlenii*. ACT Government, Canberra.
- Keith D, Stephens R, Doyle C and Pellow B 2018. *Priority Research Action Outcomes Report – Baeuerlen's Gentian*. Unpublished report as part of the Data deficient Species Research Grants Program. NSW Environmental Trust and NSW Government, Sydney.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2026. *Conservation Advice for Gentiana baeuerlenii (Baeuerlen's Gentian)*. Department of Climate Change, Energy, the Environment and Water, Canberra. <http://www.environment.gov.au/biodiversity/threatened/species/pubs/12001-conservation-advice-06022026.pdf>
- Wilkins K and Keith DA 2019. *SOS Data Deficient Species: Targeted survey results and management recommendations for Gentiana baeuerlenii* L.G.Adams. Centre for Ecosystem Science, University of New South Wales, Sydney.

FURTHER INFORMATION

Further information on the species or other threatened species and ecological communities can be obtained from the Environment, Planning and Sustainable Development Directorate (EPSDD).
Phone: (02) 132281, EPSDD Website: <https://www.environment.act.gov.au/nature-conservation>

ATTACHMENT A: LISTING ASSESSMENT ([DCCEEW 2026](#))

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Threatened Species Scientific Committee finalised this assessment on 18 June 2024.

Attachment A: Listing Assessment for *Gentiana baeuerlenii*

Reason for assessment

The bushfires that burnt more than 10.3 million hectares across southern and eastern Australia in 2019–20 severely impacted native wildlife and their habitat, plants and ecosystems. This created an urgent need for hundreds of species and ecological communities (ECs) to be assessed against EPBC Act criteria for threatened listing status, so that the recovery and future resilience of fire-affected species and ECs could be supported by statutory protection commensurate with their post-fire status, and to ensure EPBC Act lists are as current and accurate as possible, helping improve environmental resilience and preparedness for future fire events.

As part of the Australian Government's bushfire response the Department engaged scientific experts to deliver a number of Species Expert Assessment Plans (SEAPs) for groups of fire-affected and non-fire affected species and ECs, to enable hundreds of species and ECs to be assessed against EPBC Act criteria for threatened listing status and improve the currency of EPBC Act lists in a timely manner.

This assessment follows evaluation of the conservation status of Baeuerlen's gentian through the SEAP project.

Assessment of eligibility for listing

This assessment uses the criteria set out in the [EPBC Regulations \(pdf 397 KB\)](#). The thresholds used correspond with those in the [IUCN Red List criteria](#) except where noted in Criterion 4, sub-criterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 3 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria. The definition of each of the parameters follows the [Guidelines for Using the IUCN Red List Categories and Criteria](#).

Table 3 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	0–20	0	>20	No plants have been sighted since 1998, although the species may persist in the soil seed bank, may be cryptic in growth, or occur in areas of suitable habitat nearby. In 1991, 20 plants were seen in Namadgi National Park. It was resurveyed in 1994 (11 plants sighted), 1997 (one plant sighted), and 1998 (four plants sighted). Surveys in known and potential habitat since 1998 have failed to locate any plants (ACT Government 2004; Wilkins & Keith 2019). In NSW, the species was last sighted in the late 1800s (NPWS 2001).
Trend	Declining			Plant numbers were already low and have declined and no plants have been sighted since 1998.
Generation time (years)	1	1	1	The species is an annual herb. The longevity of the soil seed bank is unknown.
Extent of occurrence	4	0	8	EOO was calculated by fitting a minimum convex polygon around all confirmed records as per IUCN guidelines (IUCN Standards & Petitions Committee 2024). The estimate used in the assessment assumes the species may persist at the Namadgi site in the soil seed bank or in nearby suitable habitat. The minimum estimate assumes the species is no longer extant. The maximum estimate includes all previously known sites. In both the estimate used in this assessment and the maximum plausible value, the estimate of EOO is lower than AOO and has therefore been made to equal AOO as per IUCN Guidelines (IUCN Standards & Petitions Committee 2024).
Trend	Contracting			The species was last seen in Namadgi National Park in 1998 and has not been seen since, suggesting a contraction in the species' EOO, although it is possible it persists in the soil seed bank or in nearby suitable habitat.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Area of Occupancy	4	0	8	AOO was calculated using a 2 x 2 km grid as per IUCN guidelines (IUCN Standards & Petitions Committee 2024). Minimum estimate is for no extant sites. Maximum estimate is all previously known sites. Estimate used in the assessment only includes the site where plants were last seen in 1998.
AOO is a standardised spatial measure of the risk of extinction, that represents the area of suitable habitat known, inferred or projected to be currently occupied by the taxon. It is estimated using a 2 x 2 km grid to enable comparison with the criteria thresholds. The resolution (grid size) that maximizes the correlation between AOO and extinction risk is determined more by the spatial scale of threats than by the spatial scale at which AOO is estimated or shape of the taxon's distribution. It is not a fine-scale estimate of the actual area occupied. In some cases, AOO is the smallest area essential at any stage to the survival of existing subpopulations of a taxon (such as breeding sites for migratory species).				
Trend	Contracting			The species was last seen in Namadgi National Park in 1998 and has not been seen since, suggesting a contraction in the species' AOO, although it is possible it persists in the soil seed bank or in nearby suitable habitat.
Number of subpopulations	1	0	2	Only ever known from two subpopulations. One from NSW was last sighted in the late 1800s (NPWS 2001). The second from Namadgi National Park ACT has not been seen since 1998 despite regular searches. However, given the species' cryptic nature, it is possible that the species persists in the soil seed bank or in nearby suitable habitat.
Trend	Declining			The species was last seen in Namadgi in 1998 and has not been seen since, suggesting a decline in the number of subpopulations, although it is possible it persists in the soil seed bank or in nearby suitable habitat.
Basis of assessment of subpopulation number	Only ever known from two subpopulations. One from NSW was last sighted in the late 1800s (NPWS 2001). The second from Namadgi National Park ACT has not been seen since 1998.			
No. locations	1	0	2	A range of threats (grazing, climate change, weeds) can affect the last known site at Namadgi National Park, giving one location. The maximum plausible estimate assumes both known sites remain extant, and each would constitute a separate location.
Trend	Declining			The species was last seen in Namadgi National Park in 1998 and has not been seen since, suggesting a decline in the number of locations, although it is possible it persists in the soil seed bank or in nearby suitable habitat.
Basis of assessment of location number	A range of threats (grazing, climate change, weeds) can affect the last known site at Namadgi National Park, giving one location. Upper bound assumes both known sites remain, and each would constitute a separate location.			
Fragmentation	Severely fragmented. The ACT subpopulation was only ever known to consist of few individuals and was probably too small to be viable. The two known subpopulations were too distantly located from each other for there to be any dispersal between subpopulations, although other subpopulations may exist in suitable habitat in the region.			
Fluctuations	It is not known if the species undergoes extreme fluctuations. However, as an annual herb, it may be prone to extreme fluctuations in the number of mature individuals if there is inter-annual variation in recruitment success, for example due to seasonable variability.			

Criterion 1 Population size reduction

Reduction in total numbers (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%
A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased. A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible. A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) <i>cannot be used for A3</i>] A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible. Based on any of the following (a) direct observation [except A3] (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat (d) actual or potential levels of exploitation (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites			

Criterion 1 evidence

Insufficient data to determine eligibility

No plants have been sighted since 1998. At the one recorded site in NSW, the species was last sighted in the late 1800s (NPWS 2001). In Namadgi National Park, ACT, the species declined from 20 plants in 1991 to four plants in 1998. Surveys since 1998 have failed to locate any plants (ACT Government 2004; Wilkins & Keith 2019; J Seddon 2022. pers comm 19 July; F Grant 2022. pers comm 15 July). Generation length is one year as the species is an annual. There are no data from the last 10 years or over the last three generations (3 years) to assess population decline.

The Committee considers that there is insufficient information to determine the eligibility of Baeuerlen's gentian for listing in any category under this Criterion.

Criterion 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy

	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km ²	< 5000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2000 km ²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Criterion 2 evidence

Eligible under Criterion 2 B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v) for listing as Critically Endangered

Both Extent of Occurrence (EOO) (4 km²) and Area of Occupancy (AOO) (4 km²) meet the thresholds for Critically Endangered. EOO was calculated by fitting a minimum convex polygon around all confirmed records as per IUCN guidelines (IUCN Standards & Petitions Committee 2024), and AOO was calculated using a 2 x 2 km grid as per IUCN guidelines (IUCN 2022). The estimate of EOO is lower than AOO and has therefore been made to equal AOO as per IUCN Guidelines (IUCN Standards & Petitions Committee 2024).

In addition to these thresholds, at least two of the following three conditions must be met.

Severely fragmented and number of locations

The species is severely fragmented. The ACT subpopulation was only ever known to consist of few individuals and was probably too small to be viable. The two known subpopulations were too distantly located from each other for there to be any dispersal between subpopulations, although other subpopulations may exist in suitable habitat in the region.

There is one threat-based location. The species was only ever known from two subpopulations, the first from NSW last sighted in the late 1800s, and the second from Namadgi National Park, ACT which has not been seen since 1998. A range of threats (grazing, climate change, weeds) can affect the site where the species was last recorded at Namadgi National Park.

Continuing decline

Baeuerlen's gentian has only even been known from two subpopulations. The NSW subpopulation was last sighted in the late 1800s and the Namadgi National Park (ACT) subpopulation has not been seen since 1998 despite repeated surveys, suggesting a contraction in the species' EOO, AOO, number of subpopulations and locations and number of mature individuals. Given the species' cryptic nature, it is possible it persists in the soil seed bank or in nearby suitable habitat.

The species' disjunct distribution may be due to loss and modification of suitable habitat which has been taking place due to land clearing and pasture improvement (including fertiliser application). Wilkins and Keith (2019) found only eight of the 34 sites examined for suitable habitat for the species remained sufficiently intact to be potential habitat, indicating a likely decrease in the amount of suitable habitat available to the species. Furthermore, at the Orroral Valley, Namadgi National Park site, Wilkins and Keith (2019) found the fencing to protect the habitat from grazing was in disrepair, while at other potential habitat sites, active sheep and cattle grazing was a problem. Stock grazing can kill plants and damage habitat due to the hard hooved nature of stock impacting the regeneration of the species and leading to an overall decline in habitat quality, if not managed accordingly. Feral pigs, capable of uprooting plants and damaging habitat, are also expected to occur in Namadgi National Park. Invasion of competing and smothering exotic plants such as large tussock species (for example, serrated tussock) as well as native woody plants, and the associated inappropriate use of herbicide to manage weeds (NPWS 2001) are also threats to the species.

In addition, climate change impacts such as increased frequency and severity of drought and rainfall reduction, particularly in autumn and winter, are also expected to affect site hydrology and moisture levels (Table 1). This in turn is likely to negatively impact the moist seepage areas the species prefers, leading to a decline in habitat quality. Projected temperature changes may also affect the species' persistence by altering germination patterns, but this requires further investigation. While the impact of fire on the species is unknown, severe fires may burn peat, kill all the seed bank, make the habitat unsuitable by altering soil hydrology and chemistry, and promote invasion by weeds and native species including woody plants from nearby areas. The interaction of increasing drought and fire would also reduce species' resilience via slower rates of maturation, lower fecundity and exposure to desiccation, leading to reduced reproduction and survival.

Therefore, continuing decline is observed and inferred in (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; and (v) number of mature individuals.

Extreme fluctuations

It is not known if the species undergoes extreme fluctuations. However, as an annual herb, it may be prone to extreme fluctuations in the number of mature individuals if there is inter-annual variation in recruitment success, for example due to seasonable variability.

Conclusion

The Committee considers that the species' geographic distribution (EOO and AOO) is very restricted, the geographic distribution is severely fragmented, the number of locations is very restricted and continuing decline is observed and inferred in EOO, AOO, area, extent and quality of habitat, number of locations or subpopulations and number of mature individuals.

Therefore, Baeuerlen's gentian has met the relevant elements of Criterion 2 to make it eligible for listing as Critically Endangered.

Criterion 3 Population size and decline

	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generations (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1000
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence

Eligible under Criterion 3 C2a(i) for listing as Critically Endangered

The estimated total number of mature individuals of this species is 0–20 (very low). No plants have been sighted since 1998. In 1991, 20 plants were seen in Namadgi National Park. It was resurveyed in 1994 (11 plants sighted), 1997 (one plant sighted), and 1998 (four plants sighted). Surveys in known and potential habitat since 1998 have failed to locate any plants (ACT Government 2004; Wilkins & Keith 2019). In NSW, the species was last sighted in the late 1800s (NPWS 2001).

C1. Rate of continuing decline

In Namadgi National Park, the species declined from 20 plants in 1991 to four plants in 1998. Surveys since 1998 have failed to locate any plants (ACT Government 2004; Wilkins and Keith 2019; J Seddon 2022. pers comm 19 July). Generation length is one year as the species is an annual herb. There are no data from the last 10 years or over the last three generations (3 years) to assess decline.

C2. Continuing decline and subpopulation abundance

There is an observed and inferred continuing decline in the number of mature individuals (see Criterion 2 evidence). In addition, the geographic distribution is precarious for the survival of the species because:

(a)(i) the number of mature individuals in each subpopulation is <50.

Extreme fluctuations

It is not known if the species undergoes extreme fluctuations. However, as an annual herb, it may be prone to extreme fluctuations in the number of mature individuals if there is inter-annual variation in recruitment success, for example due to seasonable variability.

Conclusion

The Committee considers that the estimated total number of mature individuals of Baeuerlen's gentian is very low. There is an observed and inferred continuing decline and the geographic distribution is precarious for the survival of the species because the number of mature individuals in each subpopulation is <50. Therefore, Baeuerlen's gentian has met the relevant elements of Criterion 3 to make it eligible for listing as Critically Endangered.

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1000
D2.¹ Only applies to the Vulnerable category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to Critically Endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km ² or number of locations ≤ 5

¹ The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the [common assessment method](#).

Criterion 4 evidence

Eligible under Criterion 4 D for listing as Critically Endangered

The number of known mature individuals of this species is 0–20 (extremely low), therefore, Baeuerlen's gentian has met the relevant elements of Criterion 4 to make it eligible for listing as D Critically Endangered.

The number of locations for the species is under five and the EOO is very restricted (Table 3), and there are several serious plausible threats to the species (Table 1). The species therefore may meet the relevant elements of Criterion 4 to make it eligible for listing as D2 Vulnerable.

Criterion 5 Quantitative analysis

	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Criterion 5 evidence

Insufficient data to determine eligibility

Population viability analysis has not been undertaken. Therefore, there is insufficient information to determine the eligibility of Baeuerlen's gentian for listing in any category under this Criterion.

Adequacy of survey

The survey effort has been considered adequate and there is sufficient scientific evidence to support the assessment.

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 30 business days between 6 September and 30 October 2023. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process and provided to the Minister for the Environment with the Committee's advice.