

**Advice to the Minister for Sustainability, Environment,
Water, Population and Communities
from the Threatened Species Scientific Committee (the Committee)
on Amendment to the list of Threatened Species under the
*Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)***

1. Name

Liopholis guthega

The species is commonly known as the Guthega Skink. It is in the Family Scincidae.

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list the Guthega Skink. The nominator suggested listing in the endangered category of the list.

This is the Committee's first consideration of the species under the EPBC Act.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **endangered**.

The highest category for which the species is eligible to be listed is **endangered**.

4. Taxonomy

The species is conventionally accepted as *Liopholis guthega* (Donnellan et al., 2002) (Guthega Skink) (Wilson and Swan, 2008). Its previous scientific names include *Egernia guthega* and *Egernia whitii*.

5. Description

The Guthega Skink is a medium-sized scincid lizard with a snout-vent length up to 111 mm (Donnellan et al., 2002). It is blackish-brown on the back and upper flanks with greyish-brown back and side stripes and numerous longitudinal rows of sharp, pale spots (Wilson and Swan, 2008). The colour pattern of juveniles is often more pronounced than that of adults, with more prominent spots (Wilson and Swan, 2008). The Guthega Skink is similar in appearance to *Egernia whitii* and *Egernia montana* but is distinguished by having a shorter tail and the presence of a blackish, upper side-stripe, overlain by two or three series of light grey or cream dots (Donnellan et al., 2002).

6. National Context

The Guthega Skink is endemic to New South Wales and Victoria. It is restricted to locations above 1600 m in the Australian Alps, in the vicinity of Mt Kosciuszko, NSW, and the Bogong High Plains, Victoria (Donnellan et al., 2002; Chapple et al., 2008). It is located within the North East Victoria and Southern Rivers New South Wales Natural Resource Management Regions and in the Australian Alps IBRA Bioregion.

The Guthega Skink is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988* and is considered critically endangered on the Advisory List of Threatened Vertebrate Fauna in Victoria, 2007. The species is protected under the NSW *National Parks and Wildlife Act 1974*.

7. Relevant Biology/Ecology

The Guthega Skink occurs between 1600 m and 2170 m – in the coldest (winter snow cover) and some of the wettest regions on mainland Australia (Green and Osborne, 1994; Donnellan et al., 2002; Green, 2010 pers. comm.). Preferred habitats are usually rocky or have sub-surface boulders hidden beneath soil or thick vegetation. The NSW distribution occurs where there is a granite substrate and decomposing granite soils (Green and Osborne, 1994). Individuals have been recorded in a range of vegetation types, including open *Eucalyptus pauciflora* (Snow Gum) woodland with grassy or shrubby understoreys, dry tussock grassland, and tall and short heath.

A review of the life history of all *Liopholis* and *Egernia* species suggests that the Guthega skink would take 3–4 years to reach sexual maturity and have a lifespan of at least 8–10 years (Chapple, 2003). The Guthega Skink mates in late spring or early summer and gives birth to three or four live young in February–March (Green and Osborne, 1994; Donnellan et al., 2002). Otherwise the breeding system and breeding success of the Guthega Skink is largely unknown (Chapple, 2009 pers. comm.).

The social structure and dispersion of the Guthega Skink is poorly known, but they are known to be colonial, and live in warren systems. It is likely that adults have considerable site fidelity frequenting a familiar burrow network and basking and foraging areas. Consequently, home ranges are likely to be small.

The diet of the Guthega Skink is likely to be dominated by invertebrates, which are taken opportunistically, with some plant material likely to be included (Clemann, 2007 pers. comm.).

The species' ecological role is not clear, although it is a predator of small invertebrates, and is likely to be prey for a variety of vertebrate species, including elapid snakes and birds.

8. Description of Threats

The main current threats to the Guthega Skink are loss and degradation of habitat, predation and wildfire. The impacts of climate change and weeds are potential threats.

Historically, large tracts of suitable habitat have been lost as dams and alpine resort villages have been constructed and expanded. Concurrent development of infrastructure such as roads, tracks and ski runs have also destroyed, fragmented or modified habitat. This impact is most pronounced in and around the dams and alpine villages and ski fields, although roads and tracks occur throughout the area of occupancy of the species. The effect on the Guthega Skink of loss of habitat is almost certainly a reduction in the extent of occurrence of the species, and probably isolation of some populations (Clemann, 2007 pers. comm.).

Degradation of the species' habitat has resulted from grazing and trampling by cattle, feral horses, deer and pigs and the grooming of ski runs. This degradation of habitat can extirpate the species from an area, or it can subdivide formerly continuous populations. The removal of cattle grazing from Alpine national parks has been beneficial for this species (Clemann, 2007 pers. comm.).

Predation by foxes (*Vulpes vulpes*) and cats (*Felis catus*) is a current threat. The impact on the Guthega skink of elevated levels of predation due to the introduction of exotic predators has not been quantified. It is likely that these predators have a negative influence on the species, including direct loss of individuals and changes in lizard behaviour that have a negative impact on populations. These changes in behaviour, and their costs to lizards, such as a loss of body condition (e.g. loss of body condition can have a negative impact on a population's breeding success, particularly in cold climates), are amplified by habitat loss and degradation. Continuing developments in alpine resorts and ongoing grooming of ski runs enhances exotic predator access and may further reduce Guthega Skink habitat and increase skink exposure to predators in occupied habitats.

The most likely catastrophic threat to the Guthega Skink is wildfire. The relative importance of this process has not been quantified, but is potentially of great importance to the species. Large

fires in the Australian Alps are not considered common, but two such fires have occurred in the past seven years (2003 and 2007), affecting much of the species' range in Victoria (Clemann, 2009 pers. comm.). In NSW a known colony at Smiggin Holes was eradicated by the 2003 alpine fires (Green, 2010 pers. comm.). If wildfire degradation of habitat continues, a concurrent reduction in the numbers and geographic extent of the Guthega Skink is almost certain. Predicted climate change is likely to increase fire frequency and severity in this region.

As an alpine endemic the Guthega skink is likely to be physiologically adapted to living in cold alpine conditions. The predicted warmer temperatures due to climate change are likely to present a physiological challenge to the Guthega Skink (Chapple, 2009 pers. comm.). Vegetation changes as a response to climate change may reduce available habitat for the Guthega Skink. An emerging threat resulting from climate change is the altitudinal movement of native species not previously regarded as resident above 1500 m. For example, known skink predators such as kookaburras have become regular subalpine residents in the past decade (Green and Pickering, 2002). Any impacts of climate change on the Guthega Skink will affect the species across its geographic distribution.

9. Public Consultation

The information used in this assessment was made available for public exhibition and comment for 30 business days. No comments were received.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **endangered** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

There are insufficient data to determine historic or current population trends for the Guthega Skink. The species is known from only two alpine-subalpine areas in Australia and its habitat has been reduced by historic dam and ski resort construction and development of associated infrastructure and ongoing ski resort development. The quality of the Guthega Skink's habitat has been impacted by grazing by cattle and continues to be impacted by feral horses, pigs and deer. The skinks are also likely to be predated upon by feral cats and foxes. A population decline is inferred due to the decline in quality and extent of habitat and the continuing impacts of feral species through habitat degradation and predation.

It is likely that the species has undergone a reduction in range and is likely to decline in the future, however there are insufficient quantitative data available to judge whether these declines would be at least substantial. Therefore, as the species has not been demonstrated to have met any of the elements of Criterion 1, it is not eligible for listing in any category under this criterion.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

The Guthega Skink is only known from two areas in the Australian Alps and these are both above 1600 metres. There are no quantitative data that indicate declines in the extent of occurrence of this species. Based on known distribution data, the extent of occurrence of the Guthega Skink is estimated to be less than 5000 km², which the Committee considers to be a restricted geographic distribution.

As outlined under Criterion 1, there are several actual and potential threats to the species, including ski resort development, infrastructure maintenance, predation and increased fire

occurrence as a result of climate change that are likely to lead to a future reduction in the species' extent of occurrence. The Guthega Skink's habitat is fragmented and occurs on 'sky islands'. The survival of the species under significant warming may be affected due to limited ability to disperse. Given the species' habitat requirements, its limited dispersal potential and the described ongoing threats, the Committee considers the species' geographic distribution to be precarious for its survival.

The Committee considers that the species has a restricted geographic distribution, which is precarious for the survival of the species due to ongoing threats. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 2 to make it **eligible** for listing as **endangered**.

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either

(a) evidence suggests that the number will continue to decline at a particular rate; or

(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

As discussed under Criterion 1, it can be inferred that the population of the Guthega Skink has declined and will continue to decline due to a range of threats, including loss and degradation of habitat, predation, wildfire and climate change, although there are insufficient data to estimate a particular rate of decline. As noted under Criterion 2, the species has a very restricted geographical distribution which is precarious for its survival.

However, there are no data available to estimate whether the total number of mature individuals is very low, low, limited, or not limited. Therefore, as the species has not been demonstrated to have met this required element of Criterion 3, it is not eligible for listing in any category under this criterion.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

While surveys have been conducted to determine locations where the Guthega Skink occurs, there are no data available on the species' population size (Clemann, 2009 pers. comm.)

There are no data available to estimate whether or not the total number of mature individuals is extremely low, very low, or low. Therefore, as the species has not been demonstrated to have met this required element of Criterion 4, it is not eligible for listing in any category under this criterion.

Criterion 5: Probability of extinction in the wild that is at least

(a) 50% in the immediate future; or

(b) 20% in the near future; or

(c) 10% in the medium-term future

There are no data available to estimate a probability of extinction of the species in the wild over a relevant timeframe. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Conservation Status

The Committee notes that the population size of the Guthega Skink is unknown. However, the extent of occurrence is estimated to be less than 5000 km², which the Committee judges is a restricted geographic distribution. The Committee also considers that its geographic distribution is precarious for the survival of the species given historic, ongoing and potential threats, its fragmented population and its limited opportunity for dispersal. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **endangered**.

The highest category for which the species is eligible to be listed is **endangered**.

Recovery Plan

The committee considers that there should be a recovery plan for the Guthega Skink. A recovery plan is recommended for this species as it occurs in disjunct populations across two states and will require a high level of support by key stakeholders and coordination between different land managers and across jurisdictional boundaries. It is recommended that the recovery plan for this species be prepared as part of an overall recovery plan for alpine reptiles (including the listed species *Cyclodomorphus praealtus* (Alpine She-oak Skink)), or as part of a multi-species regional plan.

12. Recommendations

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the endangered category:

Liopholis guthega

- (ii) The Committee recommends that there should be a recovery plan for this species.

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Chair
Threatened Species Scientific Committee

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