

**Advice to the Minister for the Environment, Heritage and the Arts  
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**

*Cyclodomorphus praealtus*

The species is commonly known as the Alpine She-oak 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 Alpine She-oak Skink. The nominator suggested listing in the critically endangered category of the list.

The Committee provides the following assessment of the appropriateness of the species' inclusion in the EPBC Act list of threatened species.

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 *Cyclodomorphus praealtus* (Alpine She-oak Skink) (Shea, 1995). Its previous scientific names include *Tiliqua casuarinae* and *Cyclodomorphus casuarinae*.

**5. Description**

The Alpine She-oak Skink is a medium-sized scincid lizard with a snout vent length up to 126 mm (Clemann, pers. comm., 2007) with smooth, overlapping scales and four distinct but short limbs, each with five fingers or toes. The tail is relatively short compared to species from coastal areas (Green and Osborne, 1994, p. 105). Dorsal colouration is olive green to reddish-brown, with dark edges to scales that form broken, wavy stripes and occasionally irregular, narrow bands (Wilson and Swan, 2008). The ventral surface is usually orange to reddish.

**6. National Context**

The Alpine She-oak Skink is endemic to New South Wales and Victoria. It is restricted to locations above 1500 m in the Australian Alps from Omeo Plain in the south to Kiandra in the north (Swan et al., 2004). It is located within the North East Victoria and Southern Rivers New South Wales Natural Resource Management Regions and the Australian Alps IBRA Bioregion.

This species is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988* and considered endangered on the *Advisory List of Threatened Vertebrate Fauna in Victoria – 2007*. The Alpine She-oak Skink is protected under the New South Wales *National Parks and Wildlife Act 1974*.

## **7. Relevant Biology/Ecology**

In Victoria, the Alpine She-oak Skink has only been recorded from alpine tussock grasslands, alpine heathland and alpine grassy heathland, usually above the tree line, although it does occur in grassy areas of very sparse Snow Gums (*Eucalyptus pauciflora*). In NSW, the species has only been observed in tussock grassland within the Kosciuszko region (Hunter, pers. comm., 2009). The species is not known to use heathlands, bogs, woodland and herbfields in the Kosciuszko region in NSW (Hunter, pers. comm., 2009). The species has not been observed in boulder fields or rocky outcrops despite considerable survey and research undertaken in Kosciuszko National Park (Hunter, pers. comm., 2009) and in Victorian alpine regions (Clemann, pers. comm., 2008). The Alpine She-oak Skink has a limited capacity for dispersal (Koumoundouros et al., 2009).

The topography in areas of known occurrence ranges from flat plains to rolling alpine hills and because of the cold climate, the species usually selects sunny aspects. A study of preserved museum specimens (Shea, 1995) recorded that pregnant females collected between early November and early March contained between two and nine embryos. The diet of the Alpine She-oak Skink is not known in the wild, but it is a generalist insect feeder in captivity. Predators include birds and elapid snakes, but the Alpine She-oak Skink is also preyed on by rats, foxes, cats and dogs.

## **8. Description of Threats**

The main current threats to the Alpine She-oak Skink are loss and degradation of habitat, wildfire and predation. Climate change and weeds are potential threats. Construction of dams is a past threat.

Wildfire is a current threat with direct loss of individuals and habitat loss and further degradation of habitat through subsequent vegetation succession. The species is known to retract from areas that have recently been burnt (Hunter, pers. comm., 2009b). Wildfire has the potential to eliminate the species if it occurs frequently enough (Green, pers. comm., 2008; Fitzgerald, pers. comm., 2009) and exacerbate habitat fragmentation (Fitzgerald, pers. comm., 2009).

Historically, large tracts of habitat have been lost as alpine resort villages have been constructed and expanded. Construction of dams has destroyed habitat that was almost certainly occupied by the species. Concurrent development of infrastructure such as roads, tracks and ski runs have also destroyed and fragmented habitat. Development of ski runs may have a greater than expected effect on habitat for Alpine She-oak Skinks, as it is more favourable to build ski runs in large, continuous grassy areas that provide a uniform surface. These large grassy areas are the optimal habitat of the Alpine She-oak Skink. This loss of habitat has reduced the area of occupancy of this species and probably isolated some populations.

Various other activities have led to a degradation of the species' habitat, including grazing and trampling by cattle, feral horses, deer and pigs and 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 grazing from Alpine National Parks has been beneficial to this species.

Predation by rats, foxes, cats and dogs is a current threat. These exotic predators are now present in alpine areas. The impact on the Alpine She-oak Skink of elevated levels of predation due to the introduction of exotic predators including rats, foxes, cats and dogs, has not been quantified, however it is reasonable to assume that these predators have a negative influence on the species, including direct loss of individuals.

A potential threat to the Alpine She-oak Skink is the invasion of Orange Hawkweed (*Hieracium aurantiacum*). Orange Hawkweed has invaded parts of Kosciuszko National Park, and has the capacity to spread and dominate in sub-alpine grassland areas (Williams and Holland, 2007). If not effectively controlled, this invasive weed has the capacity to greatly reduce the extent of suitable habitat for the Alpine She-oak Skink in Kosciuszko National Park (Hunter, pers. comm., 2009a).

Species in alpine areas are especially adapted to a limited suite of climatic conditions, and fauna, such as the Alpine She-oak Skink, depend upon specific vegetation structure. Changes to climate, and vegetation change as a response to climate change, are likely to have a distinct and negative impact on alpine biota, including the Alpine She-oak Skink. Changes in vegetation structure, as a response to climate change, will include upslope migration of shrubs and heaths currently found at lower elevations, consequently overtaking tussock grassland which the species depends on. Furthermore, as it already occurs on an alpine plateau, this species will have little scope for upslope migration in response to a warming climate. It is suspected that upslope migration of tussock grasslands will not occur or not be at a rate fast enough to provide habitat for the Alpine She-oak Skink at higher altitudes, due to nutrient poor skeletal soils which are not be able to support vegetation such as tussock grasses. Any impacts of climate change on the Alpine She-oak Skink will affect this species across its geographic range.

## **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 Alpine She-oak Skink. No reliable data are available with which to estimate the total population size. The Alpine She-oak Skink is known from approximately 10 populations in Victoria and New South Wales. Monitoring of the species in Victoria suggests that local abundance can be highly variable, with variations perhaps related to factors that have not yet been quantified, such as habitat quality, grazing and fire history, and predation pressure.

Both the extent and quality of the Alpine She-oak Skink's habitat are in decline. Large amounts of habitat, relative to that available and suitable for the species, have been lost to development of ski resorts and related infrastructure in alpine areas. Construction of dams has destroyed habitat that was almost certainly occupied by the species. Cattle grazing and feral horses have caused loss and trampling of vegetation, degrading habitat for the Alpine She-oak Skink throughout much of its range. Population size is inferred to have reduced due to this decline in quality of habitat but there are no quantitative data to confirm this.

The Alpine She-oak Skink may have experienced a decline and this decline may continue due to current and potential threats, including loss and degradation of habitat, wildfire, predation, weeds and climate change. However, there are no quantitative data to confirm this.

There are insufficient quantitative data available to judge whether the species has undergone, is suspected to have undergone or is likely to undergo a reduction in numbers. 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 maximum area of potential habitat for the Alpine She-oak Skink has been estimated to be no more than 440 km<sup>2</sup> (ERIN, 2009), in sub-alpine and alpine grasslands above 1500 m in the Australian Alps from Omeo Plain in the south, to Kiandra in the north (Swan et al., 2004), although much of this area is not considered suitable habitat for the species. The species has specific habitat requirements, occurring in alpine grasslands across its range, and in alpine heathland and alpine grassy heathland in Victoria. These habitats generally have a disjunct occurrence and are within a matrix of other alpine and sub-alpine habitats in which the Alpine She-oak Skink is not known to occur. Within some known locations of occurrence, the species' distribution is further fragmented by ski resort buildings and/or groomed ski slopes, roads and tracks. Given its narrow habitat requirements it has a limited capacity for dispersal. There are limited data with which to estimate the area of occupancy, however, due to the species' specific habitat requirements, it is probably less than 100 km<sup>2</sup>.

The species' distribution is severely fragmented as all known populations are isolated. These sites are separated by distances that exceed the presumed dispersal capacity of the species. Koumoundouros (2008) suggests that the three Victorian populations should be considered a discrete Evolutionarily Significant Unit compared to the New South Wales population. Koumoundouros and colleagues (2009) further showed that each of the four known populations are limited to specific 'sky islands' and that there is no current inter-population gene flow.

The Committee judges that the species has a restricted geographic distribution which is precarious for its survival due to severely fragmented populations, dispersal limitations and current and potential threats from loss and degradation of habitat, wildfire, predation, weeds and climate change. 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 Alpine She-oak Skink has declined and will continue to decline due to a range of threats including loss and degradation of habitat, wildfire, predation, weeds and climate change. As noted under Criterion 2, the species has at least a restricted geographic distribution which is precarious for its survival. However, attempts to determine population size using mark-recapture rates have not been successful (Clemann, pers. comm., 2008) and it is not known if the total number of mature individuals is limited to any particular degree. 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**

Attempts to determine population size of the Alpine She-oak Skink using mark-recapture rates have not been successful (Clemann, pers. comm., 2008) and it is not known if the total number of mature individuals is limited to any particular degree.

Therefore, there are insufficient data available to estimate whether or not the total number of mature individuals is extremely low, very low, low or not 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 insufficient 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 accepts that there may have been a decline in the number of mature individuals and that this decline is likely to continue, but notes that there are insufficient data to judge the extent of the decline. The Committee also notes that population size of the Alpine She-oak is unknown. However, the area of occupancy is estimated to be less than 100 km<sup>2</sup>, which the Committee judges is a restricted geographic distribution that is precarious for the survival of the species given ongoing and potential threats (loss and degradation of habitat, wildfire predation, weeds and climate change), its fragmented population and its limited capacity 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 this species. The Alpine She-oak Skink faces ongoing and potential threats of loss and degradation of habitat, wildfire, predation, weeds and habitat reduction due to climate change combined with a restricted geographic distribution which is considered precarious for its survival. This species requires multi-jurisdictional management actions that could be better achieved with a recovery plan in place.

## 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:

*Cyclodomorphus praealtus*

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

Associate Professor Robert J.S. Beeton *AM FEIANZ*

Chair

Threatened Species Scientific Committee

### 13. References cited in the advice

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