

Action Statement

Flora and Fauna Guarantee Act 1988

No. 114

Alpine Water Skink *Eulamprus kosciuskoi*

Description and distribution

The Alpine Water Skink *Eulamprus kosciuskoi* (Kinghorn 1932) is a robust skink, with a body length of up to 80mm, that occurs in alpine and montane areas in south-eastern Australia. The dorsal colour is olive-brown, with black stripes along the centre and sides of the back, and a yellow-brown stripe along the dorso-lateral area; these stripes extend from the neck to the base of the tail. The upper flanks are black with a series of cream to yellow spots, becoming blotches on the tail, the lower flanks are white or cream to pale yellow, often with irregular vertical black barring. The underside is pale grey to yellow, with a few grey spots on the throat and occasional small black flecks on the chest and stomach. The presence of a dark vertebral stripe and the absence of pale grey blotches and mottling on the ventral surface (Cogger 2000) can be used to distinguish this species from the similar and often sympatric Southern Water Skink *E. tympanum*.

The Alpine Water Skink consists of at least two distinct forms: a southern form, restricted to alpine and sub-alpine areas (officially recorded above 1 300m, although the species may be present down to about 1 000m) of the Victorian and southern NSW Alps; and northern forms, occurring in disjunct montane sites on the New England plateau and the Barrington Tops in north-eastern NSW (Wilson & Knowles 1988). These forms may be distinct species, and the following discussion refers to the southern form unless otherwise noted.



Alpine Water Skink, *Eulamprus kosciuskoi*
(Image: © Graeme Gillespie)



Distribution in Victoria

+ before 1970, ■ since 1970

[source: *Atlas of Victorian Wildlife*, NRE 2000a]

The Alpine Water Skink inhabits sphagnum moss beds and adjacent wet heathlands along alpine and sub-alpine drainage lines. It is an active diurnal skink, and often enters water when disturbed.

It digs burrow systems into and under the sphagnum, and may also shelter under embedded logs and rocks (Jenkins and Bartell 1980, Ehmann 1992). These burrows probably provide a winter refuge whilst the area is covered by snow. The Alpine Water Skink is viviparous (live-bearing), mates in spring and produces an average litter of three (range 1-6) young in late summer (Greer 1989). Aggressive displays, fights and defence of territories occur between conspecific males; this species is more aggressive towards conspecifics than other members of the genus (Done & Heatwole 1977, Greer 1989).

In Victoria, the Alpine Water Skink has been recorded from Dinner Plain (P. Robertson *pers. comm.*), Davies Plain (where it is locally abundant), the Playgrounds, east of Mt Murphy, Rocky Plains in the Cobberas region, the Nunniong Plains and near Falls Creek on the Bogong High Plains (Atlas of Victorian Wildlife database); all of these sites are above 1300m above sea level. A single record originates from State forest, whilst all other records originate from the Alpine National Park. In NSW, the southern form is found in the Mt Kosciuszko region.

Originally nominated and listed as *Sphenomorphus kosciuskoi* (SAC 1992), the Alpine Water Skink is currently placed in the genus *Eulamprus* (Greer 1989, Cogger 2000, Hutchinson 1993).

Current conservation status

Victoria Critically Endangered (NRE 2000b)

The Alpine Water Skink has been listed as a threatened taxon under the **Flora and Fauna Guarantee Act 1988**. The Alpine Water Skink has a very restricted and disjunct distribution in Victoria; all known populations are isolated from each other by extensive areas of unsuitable habitat. It has highly specialised habitat requirements, being restricted to undisturbed sphagnum bog areas along drainage lines in treeless alpine plains and valleys. No information is available on population sizes.

Much of the alpine and sub-alpine area of Victoria has been surveyed for reptiles and, while further survey may locate additional populations, it is unlikely that this will result in a major range extension. Searching at Mt Hotham, for example, has failed to find this species (Coventry & Robertson 1980).

Because of its specific habitat requirements, the Alpine Water Skink is threatened by damage to drainage lines and their associated vegetation,

caused by grazing and trampling by cattle and feral horses (Coventry & Robertson 1980, Mansergh 1982). Severe habitat degradation due to trampling has been noted at numerous sites where the species occurs (Coventry and Robertson 1980, Mansergh 1982, R. Martin and M. Bramwell *pers. comm.*). Recreational activities, such as horse-riding, hiking, cross-country skiing and four-wheel driving, where they are uncontrolled or occur in unsuitable areas, are also potential threats to this habitat.

The congeneric Southern Water Skink is widespread within the distribution of, and often sympatric with, the Alpine Water Skink. Disturbance that alters the structure or water flow of the sphagnum bogs may allow a competitive interaction between these two species that may exclude the Alpine Water Skink, or reduce its numbers. Consequently, the major threat to the Alpine Water Skink has been identified as deterioration or reduction of its specialised habitat (alpine sphagnum bogs) by:

- grazing and/or trampling by cattle,
- grazing and/or trampling by wild horses,
- damage to vegetation by recreational activities such as horse-riding, hiking, skiing, or four-wheel driving, and
- potential offsite effects of grazing, such as changes in water quality or flow due to processes such as damming of streams and the construction of drains or the expansion of dams in skink habitat

In its final recommendation, the Scientific Advisory Committee (SAC 1992) determined that the Alpine Water Skink is:

- significantly prone to future threats which are likely to result in extinction; and
- very rare in terms of abundance or distribution.

Major conservation objective

The major conservation objective for the Alpine Water Skink is to ensure that the species survives, flourishes and maintains its potential for evolutionary development in the wild. Whilst our knowledge of the ecology of this species is poor, the threats to its habitat are clear and can be managed to prevent further deterioration. Management should proceed and be further refined when results of proposed research become available. Consequently, the major conservation objectives are to:

- ensure that all known localities of the Alpine Water Skink in the conservation reserve system in the Victorian Alps are protected within special protection management zones within these reserves,

- manage the habitat of the Alpine Water Skink within these special protection management zones in the conservation reserve system to avoid habitat deterioration and consequent population decline,
- exclude degrading processes, such as cattle grazing, trampling by feral horses and damage caused by recreational activities, from the habitat of the Alpine Water Skink,
- investigate and implement methods to rehabilitate and restore degraded habitat,
- ensure that management of any populations found to occur outside the reserve system takes account of the ecological requirements of the Alpine Water Skink, and
- undertake survey and research to accurately determine the distribution, population size, and habitat requirements of the Alpine Water Skink, and use the knowledge so gained to refine management strategies for the habitat of the species.

Management issues

Ecological issues specific to the taxon

The moss bed and wet heathland habitats on drainage lines in which the Alpine Water Skink occurs are sensitive to physical damage to the vegetation and soil, and to alterations of hydrology. Widespread physical damage to such areas is most frequently caused by wild horse and cattle grazing, and continued grazing in these areas is incompatible with conservation. The number of wild horses perceived to occur in the alpine region is likely to be a considerable under-estimation (R. Martin *pers. comm.*).

Damage from recreational activities usually occurs where tracks are poorly located or inadequately constructed, or where recreational users stray off tracks or traverse areas that do not have tracks. This can be a particular problem at times of shallow or patchy snow cover that is inadequate to protect plants, and sometimes the soil below, but is enough to allow skiing. Skiers do not normally keep to defined tracks in open plains and, even if they did, the locations of constructed tracks are hidden beneath the snow. In patchy snow, skiers may have access to larger snow patches by walking across intervening snow-free areas, where they can cause considerable damage.

Changes to hydrology may also degrade the Alpine Water Skink's habitat, through processes such as flooding and silting of streamside vegetation. A range of activities, including diversion of water along poorly placed or eroded tracks or damming of rivers and streams, can cause these changes.

Little is known about the population ecology of the Alpine Water Skink. In highland areas the closely related and broadly sympatric Southern Water Skink is a long-lived and slow-growing lizard, females of which exhibit late maturity (3-4 years) and do not breed every year (Schwarzkopf 1993). It is likely that the Alpine Water Skink has a similar life history. As such, recruitment rates may be very low, and populations may take a long time to recover following a reduction in numbers. Research into the demography of the Alpine Water Skink is needed.

The impact of feral predators such as cats and foxes has not been quantified, however observations of foxes in some alpine areas has shown that they prey on a range of reptile species, including the Alpine Water Skink (R. Martin *pers. comm.*).

Wider conservation issues

Management to conserve the Alpine Water Skink will also aid in the conservation of the vegetation of alpine and sub-alpine drainage lines and of other associated fauna. The Alpine Bog Community and the Fen (Bog Pool) Community, both of which provide habitat for the Alpine Water Skink, have been listed under the **Flora and Fauna Guarantee Act 1988**, as has the sympatric Alpine Bog Skink *Pseudemoia cryodroma*, which is classified as Vulnerable in Victoria (NRE 2000b), and Alpine She-oak Skink *Cyclodomorphus praealtus*, classified as Endangered in Victoria. Similarly, soil erosion and vegetation damage and disturbance in the alpine regions of Victoria caused by cattle grazing is listed under the **Flora and Fauna Guarantee Act 1988**. The Alpine Tree Frog *Litoria verreauxii alpina*, which has been recommended for listing (SAC 2000) and is classified as 'Critically Endangered' in Victoria (NRE 2000b) and 'Vulnerable' nationally (ANZECC 1999), occupies similar alpine habitats to the Alpine Water Skink, and is probably subject to the same threatening processes. The amelioration of threats to the Alpine Water Skink is likely to benefit all of the species and communities listed above.

Previous management action

There have been a number of general surveys in the Victorian alps which have recorded the Alpine Water Skink. The *Atlas of Victorian Wildlife* database (as of April 2000) has 71 records of the species collected between 1975 and 1999.

The Alpine Bog Community and the Fen (Bog Pool) Community, both of which provide habitat for the Alpine Water Skink, have been listed under the **Flora and Fauna Guarantee Act 1988**. Soil erosion and vegetation damage and disturbance in the alpine regions of Victoria caused by cattle grazing

has been listed as a potentially threatening process under Schedule 3 of the Flora and Fauna Guarantee Act.

The realignment and reconstruction of the four-wheel drive track along the Playgrounds to avoid wet areas and enhance vegetation conservation has reduced damage to habitat of the Alpine Water Skink. A proposed fence around bog areas at the Playgrounds to prevent degradation by cattle grazing and trampling will also protect Alpine Water Skink habitat.

A number of sites where the Alpine Water Skink is known to occur (Mt Cope area, Davies Plain, east of Mt Murphy and the Playgrounds) have been designated Special Protection Zones in the Alpine National Park. Where research, survey or monitoring indicates that grazing is having an adverse effect on environmental values, exclusion of stock, or reduction of stocking levels or of grazing intensity may be adopted.

Intended management actions

Site Management and Habitat Protection

1. Manage areas within the Alpine National Park where the Alpine Water Skink occurs for protection of the species' habitat. Identify such areas within the Alpine National Park Management Plan.

Responsibility: Parks Victoria

2. If the species is found to occur in State forest, sites will be protected by appropriate zoning and prescriptions.

Responsibility: NRE (Forests Service)

All sites at which the Alpine Water Skink occurs:

3. Where the impact of trampling by cattle and/or wild horses is found to be affecting populations of Alpine Water Skink, implement actions, in liaison with affected parties (e.g. cattle graziers), to mitigate this impact. Such actions may include fencing of the habitat, lowering of cattle stocking rates, or encouraging graziers to ensure that stock avoid the habitat of the species;

Responsibility: Parks Victoria

4. Relocate or improve any poorly located or constructed tracks to prevent damage to habitat;

Responsibility: Parks Victoria

5. Locate and clearly mark ski trails so as to avoid Alpine Water Skink habitat, and establish and clearly mark off-limit areas for hikers and skiers;

Responsibility: Parks Victoria

6. Use signs and extension materials to inform cross-country skiers of the negative environmental effects of some skiing activities at times of poor snow cover;

Responsibility: Parks Victoria

7. Restore degraded or deteriorated habitat;

Responsibility: Parks Victoria

8. Commence or intensify feral predator controls around localities from which the Alpine Water Skink has been recorded;

Responsibility: Parks Victoria

Liaison

9. Ensure consultation is undertaken with stakeholders (e.g. cattle graziers, recreational users) in regard to the measures taken to protect Alpine Water Skink and its habitat.

Responsibility: Parks Victoria

Education

10. Develop interpretive material to explain habitat protection measures and enhance co-operation with recreational users. Information to be available at park offices, ski resort offices, and perhaps on site at areas of Alpine Water Skink habitat.

Responsibility: Parks Victoria

Research

11. Facilitate and undertake research and survey as follows:

- Investigate the potential interaction between the Alpine Water Skink and the Southern Water Skink, particularly with regard to their respective habitat requirements and abilities to utilise degraded habitat to determine the latter species' potential to exclude the Alpine Water Skink from degraded habitat, or reduce its numbers.
- Survey suitable habitat specifically for Alpine Water Skink populations, to accurately determine the distribution and population sizes of the species in Victoria.
- Collect data on the demography and habitat requirements of Alpine Water Skink populations.
- Investigate further the impact of cattle and feral horse grazing and trampling on the habitat of the species;
- Investigate optimal methods to rehabilitate and restore degraded habitat.
- Use the knowledge acquired during this research (actions 9 to 11) to refine management

strategies for the Alpine Water Skink and its habitat.

- Monitor populations in areas where habitat rehabilitation has been conducted, to assess the success of rehabilitation works.
- Model the distribution and extent of available habitat under an enhanced greenhouse effect scenario, and, if possible, use this information to plan for continued provision of suitable habitat.

Responsibility: NRE (Parks, Flora and Fauna Division), Parks Victoria

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Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

This Action Statement was prepared under section 19 of the Flora and Fauna Guarantee Act 1988 under delegation from Chloe Munro, Secretary, Department of Natural Resources and Environment, December 2001.

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Published by the Department of Sustainability and Environment, Victoria. 8 Nicholson Street, East Melbourne, Victoria 3002 Australia

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ISSN 1448-9902