

Flora & Fauna Guarantee Action Statement

#35

This Action Statement was first published in 1993 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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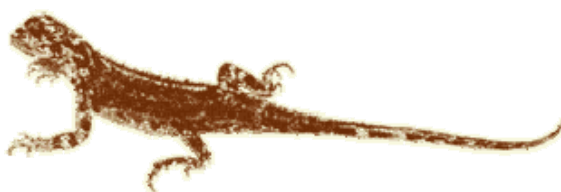
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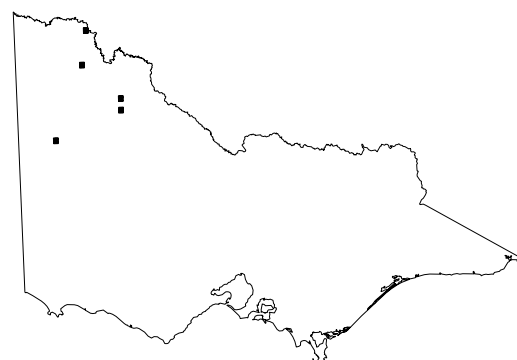
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Southern Lined Earless Dragon

Tympanocryptis lineata lineata



Southern Lined Earless Dragon
(*Tympanocryptis lineata lineata*)



Distribution in Victoria (DSE 2002)

Description and Distribution

The Southern Lined Earless Dragon (*Tympanocryptis lineata pinguicollis*) belongs to the reptile family Agamidae, the dragon lizards. Dragon lizards are characterised by having small, rough scales that usually do not overlap and well developed limbs; they are often fast moving. The genus *Tympanocryptis* differs from other dragon lizards because the tympanum, or ear opening, is covered by skin and not visible, hence the common name of earless dragons for members of this genus.

The Southern Lined Earless Dragon is a small lizard, about 150 mm total length, with a snout-vent length of about 55 mm. The upper pattern is a light grey and brown mottling, with a series of pale longitudinal stripes. From above the lizard appears to have three longitudinal stripes with five brown transverse bars between nape and hips. The under surface is white, sometimes with fine dark speckling, and there is occasionally a yellow flush on the chin and neck. There is a short row of small spines on the nape of the neck. This pattern

of markings is found in some of the other subspecies of the Lined Earless Dragon (*Tympanocryptis lineata*).

The Southern Lined Earless Dragon has been distinguished from the other subspecies of the Lined Earless Dragon on the basis of the relative widths of the neck and head (Mitchell 1948). The subspecies *pinguicollis* is stouter, and has a thick neck, broader than the head, with a short row of small spines. Mitchell (1948) proposed that the thicker neck, tail and body of the Southern Lined Earless Dragon was caused by the building up of fat bodies in response to the colder prevailing conditions and as an aid to tide it over the long winter.

An early account of this animal by McCoy (1889) notes that at first glance it resembles the young of the Tree Dragon (*Amphibolurus muricatus*) 'so much as to be easily mistaken for it'.

The Southern Lined Earless Dragon is oviparous (egg laying). The egg-laying site is unknown, although most dragon lizards lay their eggs in a specially constructed nest burrow (Greer 1989).

The species is known to go into torpor during the winter months.

There have been five sightings of this taxon between 1988 and 1990: one from the upper reaches of the Merri Creek north of Donnybrook, one on the Jackson Creek at Holden Flora Reserve and three sightings at the Little River Gorge, west of Werribee (Atlas of Victorian Wildlife, DCE).

All sightings and records of this species in southern Victoria have been from areas of rocky native tussock grassland where tree and shrub cover is sparse or absent. The recent sightings have all been from open stands of Kangaroo Grass (*Themeda* spp.) plains grassland on exposed stony crests and rocky stream escarpment (Beardsell pers. comm.). At each site where this species was observed there was an open tussock grassland of Kangaroo Grass, Red-leg Grass and Silky Blue-grass with embedded rocks (Beardsell pers. comm.). These areas were uncultivated and ungrazed or lightly grazed paddocks in broadacre farmland.

The most recent observation of the Southern Lined Earless Dragon (in the ACT) was of an individual found in a short burrow under a rock in sparse native grassland studded with rocks (W. Osborne pers. comm.). The native grassland was dominated by Spear Grass (*Stipa geniculata*) with some Kangaroo Grass. The grassland was in a broken sward, crossed by sheep tracks and lightly to moderately grazed. It appears likely that the Southern Lined Earless Dragon prefers sparse native grasslands.

Conservation Status

Current Status

DCE (1991)	Endangered
SAC	Threatened

The Southern Lined Earless Dragon has been listed as a threatened taxon on Schedule 2 of the Flora and Fauna Guarantee Act 1988.

Reasons for Conservation Status

Very little is known of the current distribution and abundance of the Southern Lined Earless Dragon. Anecdotal evidence (McCoy 1889, Wilson & Knowles 1988) suggests that the taxon was formerly not uncommon on the basalt plains north and west of Melbourne. Jenkins & Bartell (1980), because of the paucity of records, considered the taxon extremely rare in the southern highlands. In Victoria in the last two decades there have been very few records, all at three sites immediately to the west of Melbourne. Given the very limited amount of available habitat, much of which is highly fragmented and disturbed, the Southern Lined Earless Dragon must be regarded as highly endangered, perhaps with extinction imminent. The decline of the Southern Lined Earless Dragon is not well documented, but is most probably related to the extensive destruction and modification of its native grassland habitat. Since European settlement almost all of Victoria's native grasslands have been greatly altered (Stuwe 1986) by grazing and pasture improvement, clearing for crops and urban development, the application of

pesticides, fertilisers and irrigation waters and the removal of rocks for gardens. In the western region of Melbourne, an area from which there have been a number of records of the Southern Lined Earless Dragon, only one per cent of the original grassland remains and of this, three-quarters is on private land (McDougall 1987). Less than 2 km² of native grassland is in conservation reserves.

Threats

The substantial loss and modification of this habitat has had a major detrimental impact on many grassland-dependent species of flora and fauna. It is probably largely responsible for the apparent decline in the range and abundance of the Southern Lined Earless Dragon. A number of sites from which this taxon has been recorded (e.g. from the Melbourne area in the C19th and from Geelong in the 1960s) are now in urban areas and the natural habitats have been eliminated. Many species of flora and fauna inhabiting grasslands have undergone similar marked declines in range and abundance. Species such as the Eastern Barred Bandicoot (*Perameles gunnii*), Plains-wanderer (*Pedionomus torquatus*), Australian Bustard (*Ardeotis australis*), Striped Legless Lizard (*Delma impar*), and Sunshine Diuris (*Diuris fragrantissima*) have disappeared from the grasslands near Melbourne or are extremely rare.

The habitat of this taxon is itself threatened. The western basalt plains grassland community has been listed under Schedule 2 of the Flora and Fauna Guarantee Act 1988.

Taxonomic Issues

The taxonomic status of the Southern Lined Earless Dragon is of scientific interest. There is some doubt as to whether the characteristics (e.g. relative widths of head and neck) used to distinguish this subspecies from others of the Lined Earless Dragon group are consistent. This would require obtaining additional measurements from more individuals. However, regardless of its taxonomic status, the conservation of this taxon is highly desirable as it represents the most southerly range of an otherwise arid zone species, and is totally isolated. The species is at least vulnerable in Victoria (DCE 1991). In its final recommendations, the Scientific Advisory Committee (1991) determined that the Southern Lined Earless Dragon is:

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

Major Conservation Objective

The major conservation objective is to ensure that the Southern Lined Earless Dragon can survive, flourish and maintain its potential for evolutionary development in the wild. Determination of the critical habitat is a necessary step in developing and refining the management program to achieve this objective.

The conservation target is to maintain or establish a minimum of five areas of suitable native grassland habitat, each supporting a viable population of Southern Lined Earless Dragons, with a total population size of not less than 1000 individuals.

The areas must be so placed that the maintenance of any genetic variation within the taxon is maintained. Where possible, these areas should be linked by habitat corridors. The conservation program must also include contingencies to prepare for catastrophes such as loss of the taxon at one or more sites, and the need to translocate animals to suitable sites should any become available.

Management Issues

Ecological Issues Specific to the Taxon

There is little biological information on this subspecies. Jenkins & Bartell (1980) reported that the Lined Earless Dragon is diurnal and wholly ground dwelling, and that the diet is principally insects and other terrestrial invertebrates. Beardsell (pers. comm.) observed an individual Southern Lined Earless Dragon feeding on ants, grasshoppers, flies and a moth. McCoy (1889) reported the Southern Lined Earless Dragon as never climbing trees or bushes like the Tree Dragon 'but inhabiting stony plains and retreating into small holes in the ground when alarmed'. The Lined Earless Dragon is extremely wary, and will readily take cover if disturbed. It has a 'flight distance' (the minimum distance at which it will flee if disturbed) of about 50 metres (Robertson pers. comm.), making it very difficult to detect.

The Lined Earless Dragon is widely distributed across Australia, occurring in all mainland states and territories, generally inhabiting semi-arid and arid zones (Wilson & Knowles 1988). The Southern Lined Earless Dragon is the most southerly occurring of five subspecies of the Lined Earless Dragon. It is probably a remnant from a previous arid period (Robertson pers. comm.). One other subspecies, *Tympanocryptis lineata lineata*, occurs in mallee country in north-western Victoria. This subspecies is also threatened, being regarded as vulnerable (DCE 1990) in this state. The Southern Lined Earless Dragon is unusual among earless dragons by inhabiting grasslands of the basalt plains and grassy woodlands of the southern highlands of Victoria and New South Wales (Jenkins & Bartells 1980, Wilson & Knowles 1988). Within this distribution the taxon appears to be rare: the few records offer little information for accurate determination of distribution and abundance. Most records are from the basalt plains in southern Victoria. There are a small number, mostly historical, from outside this area: Rutherglen in north-eastern Victoria (Lucas & Frost 1894); Cooma in NSW (two Australian Museum specimens, Mitchell 1948); and the ACT (Jenkins & Bartell 1980, Osborne pers. comm.). The most recent of these records is a sighting of a female in August 1991 near Canberra (Osborne pers. comm.). McCoy (1889) referred to the Southern Lined Earless Dragon as 'not very uncommon at Essendon and plains near Sunbury, and to the north of Melbourne'. The last specimen collected was in 1967, a road-killed animal from west of Melbourne now lodged with the Museum of Victoria. There are records from the Geelong area in the 1960s, one from the bank of the Moorabool River and one near where the Ballarat railway line crosses the Princess Highway (P. Robertson pers.

comm.). There is also a record from Rockbank in 1968 (Robson 1968).

Apart from the fact that the preferred habitat appears to be sparse native grasslands, there is very little information on the biological requirements of the Southern Lined Earless Dragon with which to formulate conservation strategies. Beardsell (in press) has detailed the management issues for each of the sites where the taxon has recently been recorded. However there are a number of general issues which may have an impact on the conservation of the Southern Lined Earless Dragon.

The continuing habitat destruction and degradation pose the greatest threat to the taxon's survival. Clearing, ploughing, ripping, mining and widespread rock removal severely degrade areas of suitable habitat. Many areas of suitable habitat have been cleared of surface rock, cultivated and sown with dense pasture grasses and crops which are now unsuitable habitat for this lizard and all other threatened species of grassland wildlife. Urban expansion is also contributing to the loss of habitat.

Grazing possibly also poses a survival threat by changing the floristics of vegetation systems, generally reducing the diversity of native plants and increasing the cover and numbers of exotic plants. Intensive grazing can also reduce the total plant cover and lead to erosion. The combined effects of grazing- removal and degradation of ground vegetation, trampling and destruction of the litter layer, soil compaction and soil erosion-all reduce the available food resources. Removing low vegetation also removes shelter sites and increases the risk from predators.

Overgrazing by rabbits is a particular problem in the grasslands west of Melbourne. The site along the Jackson Creek at Diggers Rest within the Holden Flora Reserve (Beardsell in press) is badly affected by this. Subdividing broadacre farms into smaller farmlets is leading to increased grazing pressures on native grasslands.

Using chemicals to improve pastures and to control crop pests is also a threat to this taxon. Fertilisers favour the establishment of exotic plants because native plants are mostly adapted to low nutrient levels. Fertilisers may promote the exotics to the extent that they form dense stands which exclude native grasses. This may create habitat which is unsuitable for the Southern Lined Earless Dragon. Herbicides, often used to control grass growth as a fuel reduction method in fire control operations, usually promote the establishment of exotic grasses to the detriment of the native flora. Using them to control pasture pests may affect the invertebrates that make up the lizard's diet, thereby reducing the abundance of prey. Pesticides may also affect the lizards themselves.

Organophosphates have been shown to pose a threat to some Victorian skinks (Gray 1982).

Fire, particularly changed fire regimes, may have an impact on the Southern Lined Earless Dragon. Prior to European settlement native grasslands were often burnt by Aborigines (Nicholson 1981). In more recent times low intensity fires have been used regularly in fire prevention. This type of fire has been shown to remove the low vegetation and litter layer, depriving ground-dwelling species like this lizard of cover and food resources.

Introduced predators such as the Red Fox (*Vulpes vulpes*) and Cat (*Felis domesticus*) may prey on the Southern Lined Earless Dragon and pose a threat to its survival.

A major problem in managing the remaining populations of this lizard is the size and shape of the habitat remnants. The three known sites (Little River Gorge, Jacksons Creek at Diggers Rest and the Merri Creek at Bald Hill) are all small, narrow corridors, with a high edge to area ratio. This makes them particularly vulnerable to 'edge effects', including invasion by weeds, introduced herbivores and predators, drift from fertilisers and chemicals, grazing by stock, and increased susceptibility to fires and fire prevention works (Bennett 1990). An example of the vulnerability of small, narrow reserves is provided by the Bald Hill site. In the time since the lizard was first recorded at this site it has been heavily grazed by sheep (*Ovis aries*), which has dramatically reduced the grass cover.

Fragmentation of any remaining populations is a major problem, as the taxon is now unlikely to colonise new areas or to exchange genetic material amongst subpopulations.

Wider Conservation Issues

The conservation of all threatened grasslands flora and fauna, including the Southern Lined Earless Dragon, depends on maintaining suitable native grassland—one of the most threatened ecosystems in Victoria. The plight of this taxon is shared by a number of grassland species of flora and fauna, including the Eastern Barred Bandicoot, Plains-wanderer, Striped Legless Lizard and Sunshine Diuris.

Reserving and managing native grasslands for the conservation of this taxon is likely to benefit other indigenous grassland flora and fauna species. But retaining light grazing as a management tool for maintaining the sparse open grassland habitat that this taxon appears to prefer may not be so beneficial for other species. While the conservation of the Southern Lined Earless Dragon must be the priority at any sites where it still occurs, an ecological rather than a single species approach to management is highly desirable to maximise the conservation benefits for all species.

Social and Economic Issues

There are likely to be major social and economic obstacles to achieving the conservation objectives, given the high proportion of remaining native grasslands under private ownership and the increasing pressure on these areas from agricultural activities and expanding urban and industrial development. Additional areas of land have to be set aside and managed in specific ways to meet the conservation objective. This designated land use will generally preclude housing and industrial development, and restrict agriculture and recreation. However this social cost needs to be put in perspective: already more than 95% of Victoria's native grasslands have been destroyed or substantially altered through such activities.

The only locations where the taxon has been sighted recently are close to Melbourne, on or adjacent to sites where industrial and residential development is likely and

property values are therefore high. However, since there are few native grassland remnants left, protecting these sites for conservation would have little impact on the total amount of land available for residential or industrial subdivision around Melbourne. The social costs of the conservation program can be minimised through coordinated planning and management agreements. For example, there should be scope within the planning system for developing mechanisms (e.g. offsets, land exchange, re-zoning) to protect important habitat with minimal disadvantage to landowners and developers.

Land purchase will be more expensive. If cooperative agreements or planning arrangements cannot be implemented and land purchase is the only option, additional sources of funding will be required to ensure the conservation of the Southern Lined Earless Dragon at these sites.

Protecting Southern Lined Earless Dragon populations on farmland may be an issue. If present in such areas, the taxon is likely to persist only in native grasslands which have been lightly grazed and fertilised and still have rocky cover. If suitable habitat is identified on farming land, few opportunities will be lost if landholders maintain the current management practices and do not increase grazing and fertiliser application, or remove rocks.

These practices should be promoted through the Land for Wildlife Scheme and, wherever possible, long-term protection should be sought through conservation covenants.

Management Action

Previous Management Action

There has been no previous management action apart from field surveys carried out by CNR staff.

Intended Management Action

Management guidelines should be prepared with the landowners to minimise grazing pressure until long-term site preparation measures are developed.

Planning

- Develop management guidelines for the Holden Flora Reserve.
- Prepare a Critical Habitat determination for the Southern Lined Earless Dragon (Wildlife Section, Flora and Fauna Branch-FFB).

Research and monitoring

- Determine the extent of the known populations and attempt to locate new ones (FFB, Melbourne Region).
- Determine the habitat management requirements of the taxon (FFB).
- Define and map suitable habitat and identify it on the ground with land managers (FFB, Melbourne Region).

Habitat conservation

Protect sites at which the Southern Lined Earless Dragon occurs on public land through appropriate land management, and on private land through extension (Land for Wildlife) and covenants.

Extension

Provide identification information to all DCE staff likely to work in habitat areas and produce extension material to interested landholders and the public (Wildlife Section, Melbourne Region).

Other Desirable Management Action

Explore avenues for acquiring areas of private land where the Southern Lined Earless Dragon is known to occur. Acquiring the Bald Hill site is consistent with the Action Plan for Remnant Grasslands and Grassy Woodlands of the Melbourne area (DCE 1990).

Legislative Powers Operating

Legislation

Wildlife Act 1975: controls research, management and taking of protected wildlife.

Flora and Fauna Guarantee Act 1988: provides for the protection of flora and fauna in Victoria and the declaration of critical habitat if so designated.

Planning and Environment Act 1987: provides, through the State section of all planning schemes, protection of native vegetation.

Licence/Permit Conditions

A permit for live trapping will only be issued by the Manager, Flora and Fauna, if the proposed work falls within the framework of this action statement.

Consultation and Community Participation

Consultation with landowners will be important for the conservation of the Southern Lined Earless Dragon since nearly all known sites and potential habitat are on private land or on stream frontages leased by landholders.

Community participation in locating potential sites and reporting possible sightings would also help, considering how few sites are known and how few sightings there have been.

Implementation, Evaluation and Review

The Regional Managers, Melbourne and Geelong, of the Department of Conservation and Natural Resources will be responsible for co-ordinating the implementation of the Action Statement and monitoring the effectiveness of actions taken.

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Management

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Biology

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Compilers

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Further information

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>

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