Threatened Species Assessment

Tympanocryptis pinguicolla
Grassland Earless Dragon

Taxonomy

Tympanocryptis pinguicolla Mitchell, 1948

A recent paper (Melville et al. 2019) showed that *Tympanocryptis pinguicolla* is a different species to populations hitherto considered conspecific in the ACT and NSW. This means that the *T. pinguicolla* from Victoria, which was historically known in the vicinity of Melbourne and Geelong only, is endemic to Victoria. The last substantiated record of this species in Victoria was in 1969 (Robertson and Coventry 2019).

Current conservation status

Listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* as *Tympanocryptis lineata pinguicolla* (SAC 1991).

Categorised as Critically endangered in the 2013 Advisory list of threatened vertebrate fauna in Victoria (DSE 2013).

Proposed conservation status

Critically Endangered in Australia

Criteria B2ab(i,ii,iii,iv,v); C2a(i,ii); D

It is plausible that this taxon is now extinct, although it is possible that it might persist in one or more tiny remnants on the Volcanic Plains of Victoria. If it is not extinct, it satisfies almost every criterion for Critically Endangered. If extinct, this will probably be the first reptile extinction on the Australian mainland since the arrival of European people.

Species Information

Description and Life History

The Grassland Earless Dragon is a small (5-7 g, ~5 cm SVL), pale grey to reddish-brown agamid lizard which lacks an external ear opening and functional ear drum.

Little is known of the life history of the Grassland Earless Dragon, as the last confirmed record was in 1969, and no specific studies were conducted on extant populations. Consequently, aside from scant observations on habitat use from old literature (see below), most of the life history information published about this taxon (usually in field guides) has been derived from what is now known to be congeneric taxa in New South Wales and the Australian Capital Territory (Robertson and Coventry 2019). Such information includes that the taxon is or was oviparous, diurnal, heliothermic and probably short-lived. Its diet likely consisted of small invertebrates. Congeneric species are largely annual in life cycle, probably dying within approximately one year of birth, although some individuals survive into a second year, and they have been kept alive in captivity for in excess of 5 years (Coventry and Robertson 2019). Congeneric females produce 3 to 6 eggs in late spring or early summer, usually laid in invertebrate burrows; the eggs hatch in late summer after an incubation period of 9 to 12 weeks (Robertson and Coventry 2019).

In his *Prodromus of the Zoology of Victoria* (Decade XIX, as '*Tympanocryptis lineata*'), Frederick McCoy (1889, cited in Robertson and Coventry 2019, and referring to the Victorian species *T. pinguicolla*, as now recognised)

noted: "The habits of this lizard are ...never ascending trees or bushes..., but inhabiting stony plains and retreating into small holes, like those of the Trap-door Spider, in the ground when alarmed."

Generation Length

The generation length of Grassland Earless Dragon is inferred to be 1 to 3 years. Small terrestrial agamids typically have short lifespans.

Distribution

There have been historical records from basalt plains grassland from north of Melbourne (Essendon and near Sunbury) to around Geelong (Robertson and Coventry 2019). Indications from the literature in the late 19th and early 20th centuries indicate that the taxon was relatively common in suitable habitat around Melbourne and Geelong in those periods. Comments included:

Lucas and Frost (1894): "often met with under loose basalt boulders" (p. 50).

Kershaw (1927): "It is not uncommon along the banks of the Saltwater River (= Maribyrnong River), and on the open basalt plains to the north of Melbourne" (p. 342.).

French Jr and Tovey (1912): "...and several small lizards, *Tympanocryptis lineata* (= *pinguicolla*), were also noticed" (on Coode Island, Melbourne, p. 5).

However, the last confirmed record of this lizard was in 1969 in North Geelong (Pescott 1969). Claimed records exist from 1988 and 1990 to the north and west of Melbourne (Victorian Biodiversity Atlas VBA), but efforts to immediately substantiate these records with intensive surveys failed to confirm the taxon's presence (Peter Robertson pers. comm.), as have surveys in these areas more recently (Clemann 2003, Clemann et al. 2013, Biosis 2013, Hobby and Peterson 2018).

Habitat

The Grassland Earless Dragon is a native grassland specialist inhabiting natural temperate grasslands of the lowland plains.

Threats

Potential habitat for the taxon continues to be cleared, primarily for residential development. If any populations are extant, it is probable that they are declining due to unmitigated threats such as predation by exotic species, weed invasion, land clearing and climate change.

IUCN Criteria

Criterion A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered	Endangered	Vulnerable
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) cannot be used for A3*]

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

Evidence:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A. Ten years ago the species may have already been extinct. If it still persists any extant population(s) must be in an extremely precarious position and at very high risk of extinction.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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			

Evidence:

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 12 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. This figure is only relevant if the taxon still survives.

The taxon is estimated to be severely fragmented. If the taxon is not extinct, it is possible and perhaps probable that if any further sites were lost recolonisation would be impossible.

It is estimated to have a continuing decline in (i), (ii), (iii), (iv) and (v) above.

Criterion C. Small Population size and decline				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals				

Evidence:

Eligible under Criterion C2 as Critically Endangered

It is estimated that there are 0 to 50 mature individuals. It is plausible that this taxon is now extinct, although it is possible that it might persist in one or more tiny remnants on the Volcanic Plains of Victoria. If extinct, this will probably be the first reptile extinction on the Australian mainland since the arrival of European people.

The number of mature individuals is estimated to continue to decline, the number of mature individuals in each subpopulation is 50 or fewer and the percentage of mature individuals in one subpopulation is 90-100 %.

Criterion D. Very small or restricted population			
	Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)	< 50	< 250	< 1,000
D2 Only applies to the VU 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: AoO < 20 km2 or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 0 to 50 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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