Threatened Species Assessment

Echiopsis curta
Bardick

Taxonomy

Echiopsis curta (Schlegel, 1837)

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1995).

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

Proposed conservation status

Endangered in Victoria

Criteria A2bce+3ce+4ce; B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

The Bardick is a short, stout snake with a broad head, distinct from the neck. It has olive grey, brown to rich reddish brown non-glossy scales. The lips and head may be scattered with white flecks. The average length is 40cm, though it can reach a total length of 70cm. This snake is venomous, and although it is usually not considered dangerous to humans it can be very defensive when disturbed. It is a partly nocturnal taxon which shelters under fallen timber and rocks, in leaf litter and dense, matted vegetation and in spinifex hummocks and sometimes basks near clumps of spinifex. It is most frequently encountered crossing sandy tracks on warm evenings. It primarily eats lizards (including skinks, dragons and geckoes) but also small mammals, birds and frogs. The taxon bears live young and litters of between eight and ten have been recorded.

Generation Length

The generation length of the Bardick is inferred to be 3 to 7 years. This is based on other elapid species such as *Acanthophis antarcticus* and *Hoplocephalus* spp., which can live for 10 or more years, at least in captivity (Greer encyclopedia). For this taxon, a maximum longevity in the wild is also assumed to be around 10 years.

Distribution

This taxon occurs in three regions, all in the semi-arid regions of southern Australia. These are in south western Western Australia, the Eyre Peninsula in South Australia and in the mallee regions of eastern South Australia, north western Victoria and south western NSW.

Habitat

The taxon inhabits hummock grasslands and mallee areas on sandy or loamy soils and is usually associated with run-off slopes and drainage from local rises. It is particularly common in areas of spinifex.

Threats

Threats include habitat clearance, in particular, clearing of mallee areas containing spinifex but also removal of fallen timber and other ground cover used for shelter; and fire frequency, which directly affects the amount of cover provided and the alteration of fire frequency may reduce the availability of suitable habitat and food species.

Predation by foxes is possible given the feeding habits and activity times of the Bardick. The habitat is damaged by heavy grazing and trampling by domestic stock, feral goats, rabbits and pigs, and by loss of leaf litter, which provides shelter and foraging habitat.

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:

Eligible under Criterion A2 as Endangered

The population reduction over the past 9 to 21 years is inferred to be 50 to 75%, based on (b), (c) and (e) above.

Inferring from apparent declines from Coventry's (1996) trapping between 1979 and 1981 to that of Clemann (starting 2015), and data from between 1985-1987 (Robertson et al. 1988) compared to 2002-2009 (Robertson et al. 2012), it is probable that this taxon has declined considerably in the last couple of decades.

The causes of the reduction may not have ceased, be understood or be reversible.

Eligible under Criterion A3 as Endangered

The population reduction over the next 9 to 21 years is inferred to be 20 to 60%, based on (b), (c) and (e) above.

The probable reasons for past declines (inappropriate fire regimes, and likely predation by feral predators) continue, so further reductions are probable.

Eligible under Criterion A4 as Endangered

The population reduction over any 9 to 21 year period, including both past and future, is inferred to be 20 to 85% (midpoint 55%), based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Inferring from apparent declines from Coventry's (1996) trapping between 1979 and 1981 to that of Clemann (starting 2015), and data from between 1985-1987 (Robertson et al. 1988) compared to 2002-2009 (Robertson et al. 2012), it is probable that this taxon has declined considerably in the last couple of decades, and this decline (and the threats driving it) is likely to continue.

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 B as Endangered

The Area of Occupancy (AoO) is estimated to be 76 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

Even within the three disjunct National Parks (Murray-Sunset, Wyperfeld and Little Desert), the taxon's distribution is now likely to be severely fragmented due to inappropriate fire regimes. Clemann (unpublished data) recorded Bardicks around Chinaman Well and along Milmed Rock Track in 2017. It is probable that the taxon persists in the Little Desert, although the most recent records from there are 2002 and 2004. Populations in other parts of the Big Desert and the Murray - Sunset NP have not been confirmed for some time, and the recent fire history in these areas gives cause for serious concern about these populations.

There are likely to be three locations (supporting up to 5 subpopulations) subject to similar but varying threats. Even if five subpopulations remain, all are threatened by inappropriate fire regimes.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above. The probable reasons for past declines (inappropriate fire regimes, and likely predation by feral predators) continue, so further reductions are probable.

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:

Ineligible under Criterion C

It is suspected that there are 100 to 1,000 mature individuals, but this qualifier is too weak to meet this criterion.

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 D2 as Vulnerable

The taxon is inferred to be very restricted.

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

References

Clemann et al. (2017). Survey for the threatened Masters' Snake in the Chinaman Well area of the Big Desert, north-western Victoria. Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning.

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Coventry, A. J. (1996). The herpetofauna of the Chinaman Well area of the Big Desert, Victoria. *Proc. Royal Soc. Vic*.108:107-120.

DSE (2013) *Advisory List of Threatened Vertebrate Fauna in Victoria 2013*. Department of Sustainability and Environment, Melbourne

Greer, A.E. (2004). *Encyclopedia of Australian Reptiles.* Australian Museum Online http://www.amonline.net.au/herpetology/research/encyclopedia.pdf Version date: 7 June 2005.

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