

Threatened Species Assessment

Perameles gunnii Eastern Barred Bandicoot

Taxonomy

Perameles gunnii J. Gray, 1838

The unnamed mainland taxon is considered to warrant subspecific status by Robinson (1991), however, this conclusion was thrown into doubt by recent, more highly-resolving genetic techniques (Andrew Weekes pers. com.)

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* (SAC 1991).

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

Proposed conservation status

Endangered in Victoria

Criterion B2ab(iii)

Species Information

Description and Life History

The Eastern Barred Bandicoot is a small, 'rabbit-sized', ground dwelling terrestrial marsupial of the Peramelidae family. It is approximately 300 mm in length (body) with a 110 mm long tail. On average, Eastern Barred Bandicoots weigh approximately 800 g, but individuals may weigh up to 1100 g. They are insectivorous and have high fecundity. The fur is grey-brown to buff above, somewhat paler on the sides and pale grey to white below, with three or four pale bars on the hindquarters (giving rise to the common name) (Brown 1989; Seebeck 1979).

The Eastern Barred Bandicoot occurs mostly in grasslands and grassy woodlands, especially near watercourses and where soil moisture is high, and where a range of habitats may abut (notably including dense cover for refuge and open areas for foraging). It is terrestrial and nocturnal, sheltering during the day in grass-lined nests in dense vegetation or other cover. Home range size varies between sites, habitats and years. Home ranges are partly overlapping, and occupy 2-6 ha for females and 4-13 ha for males (Jenkins 1998; Mallick et al. 2000).

Reproduction can occur throughout the year, but may be depressed during extended low rainfall periods (Hill et al. 2010). Under favourable conditions, the Eastern Barred Bandicoot is highly fecund, with females able to produce up to 4-5 litters per year, each of 1-5 young (Seebeck 1979).

Generation Length

The generation length of the Eastern Barred Bandicoot is estimated to be 1 to 2 years, according to Woinarski et al. (2012). Sexual maturity is reached at 3-5 months for females and 5-6 months for males (Dufty 1995, Mallick et al. 2000 cited in Woinarski et al. 2012). Longevity in the wild is typically 2-3 years.

Distribution

The Eastern Barred Bandicoot is restricted to south-eastern Australia. In Tasmania, it is found in the east and north of the state (Mallick et al. 1997). On the Australian mainland, the taxon once occurred from near Melbourne through southwestern Victoria to the far south-eastern corner of South Australia, occupying a total range of about

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three million hectares (Seebeck 1979; Brown 1989). Within Victoria its distribution was encompassed by the Victorian Volcanic Plains IBRA bioregion (sensu DEH 2000). Since European settlement, however, the taxon has undergone a widespread, sustained and catastrophic decline in range and abundance on the mainland. The mainland subspecies is now considered extinct in the wild. Reintroductions have been attempted at multiple locations within the taxon's former range in south-western Victoria. Five reintroduced populations are currently extant and producing the second generation of viable offspring.

Habitat

On mainland Australia, the original habitat of the Eastern Barred Bandicoot was probably native perennial tussock grasslands and grassy woodlands, particularly along watercourses (Brown 1989; Dufty 1994; Seebeck 1979). The taxon requires structurally complex habitats with dense cover for nesting adjacent to more open areas suitable for feeding (Cook 2001; Dufty 1991).

However, the last known remaining wild mainland population occurred in highly modified habitats such as tree plantations, farmland, gardens and parklands: areas often dominated by weed species such as Gorse (*Ulex europaeus*) and Sharp Rush (*Juncus acutus* subsp. *acutus*) (Brown 1989; Dufty 1994).

Threats

The last remaining wild population of the mainland Eastern Barred Bandicoot occurred in and around the city of Hamilton in south-western Victoria. The last confirmed sighting was in 2002; this population is now considered extinct. due to habitat loss, predation by feral animals, mainly fox and cats, loss of genetic diversity and small population size. The translocated sites rely on predator exclusion and management of macropod populations for habitat quality.

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%

<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>	<p>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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Evidence:

Ineligible under Criterion A

The past population reduction does not meet the threshold for eligibility under criterion A2, and the future population reduction does not meet the threshold for eligibility under criterion A3.

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 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
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 Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 284 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas. This figure included sites of recent translocations. Any populations that were established five or more years ago and have produced viable offspring can be included in this assessment.

The taxon is estimated to be severely fragmented, and is estimated to have a continuing decline in area, extent and quality of habitat. The Eastern Barred Bandicoot requires structurally complex habitats with dense cover for nesting, adjacent to more open areas suitable for feeding (Cook 2001; Dufty 1991), such as native perennial tussock grasslands and grassy woodlands. Those habitats are subject to continuing decline.

There are multiple, small isolated subpopulations that are all at risk from predation, in the absence of ongoing management, such that there is increased extinction risk and no probability of natural recolonisation should subpopulations become extinct.

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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 inferred that there are 788 to 1,123 mature individuals, but other thresholds under this criterion have not been met.

Criterion D. Very small or restricted populations		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 km ² or number of locations ≤ 5

Evidence:

Eligible under criterion D2 as Vulnerable

The taxon is estimated to be very restricted.

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

References

Brown, P.R., (1989). Management Plan for the Conservation of the Eastern Barred Bandicoot, *Perameles gunnii*, in Victoria. *Arthur Rylah Institute for Environmental Research Technical Report Series No. 63*.

DEH (2000). Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of Environment and Heritage, Canberra



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

Dufty, A.C. (1991). Some population characteristics of *Perameles gunnii* in Victoria. *Wildlife Research* 18: 355-366.

Dufty, A.C. (1994). Population demography of the Eastern Barred Bandicoot (*Perameles gunnii*) at Hamilton, Victoria. *Wildlife Research* 21: 445-457.

Hill, R. and Coetsee, A. (2018). National Recovery Plan for the Mainland Eastern Barred Bandicoot *Perameles gunnii* (unnamed subspecies). Department of Environment, Land, Water and Planning, Melbourne.

Jenkins, S.L. (1998). The ecology, life history and conservation of the Eastern Barred Bandicoot *Perameles gunnii* in a reintroduced population. MSc Thesis, Monash University.

Mallick, S. A., Driessen, M. M. and Hocking G. (1997). Population indices for the eastern barred bandicoot. *The Journal of Wildlife Management* 61:1378-1383.

Mallick, S.A., Driessen, M.M. and Hocking, G.J. (2000). Demography and home range of the eastern barred bandicoot (*Perameles gunnii*) in south-eastern Tasmania. *Wildlife Research* 27: 103-115.

Robinson, N.A., Sherwin, W.B. and Brown, P.R. (1991). A note on the status of the Eastern Barred Bandicoot, *Perameles gunnii*, in Tasmania. *Wildlife Research* 18: 451-457.

Scarlett, N.H., Wallbrink, S.J. and McDougall, K. (1992). *Field Guide to Victoria's Native Grasslands*. Victoria Press: South Melbourne.

SAC (1991). Flora and Fauna Guarantee Scientific Advisory Committee: Final Recommendation on a Nomination for Listing. Nomination No. 49 *Perameles gunnii*

Seebeck, J.H., (1979) Status of the Barred Bandicoot, *Perameles gunnii*, in Victoria: with a note on husbandry of a captive colony. *Australian Wildlife Research* 6: 255-264.

Seebeck, J.H., Bennett, A.F. and Dufty, A.C. (1990). Status, distribution, and biogeography of the Eastern Barred Bandicoot, *Perameles gunnii* in Victoria. Pp.21-32 In Clark, T.W. and Seebeck, J.H. (eds) *Management and Conservation of Small Populations*. Chicago Zoological Society, Brookfield, Illinois.

Woinarski J., Burbidge A. and Harrison P. (2012) *The Action Plan for Australian Mammals 2012*. CSIRO Publishing.