Threatened Species Assessment

Dasyornis brachypterus
Eastern Bristlebird

Taxonomy

Dasyornis brachypterus

The Eastern Bristlebird is confined to three regions in south-eastern Australia. Recent genetic investigations (Roberts et al. 2011) have concluded that there are four distinct populations or management units: one northern, two central and one southern, which will be discussed more fully in the Distribution section. Limited evidence suggests that Eastern Bristlebirds in the northern population are morphologically distinct from the two more southerly populations. Northern birds appear to be larger and have brighter plumage (Chaffer 1954) and make bulkier nests (Holmes 1989) than southern birds. Schodde and Mason (1999) found several consistent but subtle plumage differences between the northern population and the central and southern populations, and proposed that the northern population should be recognised as a distinct subspecies with the name *Dasyornis brachypterus monoides*. They also proposed that the central and southern populations comprise the nominate subspecies *Dasyornis brachypterus brachypterus* (OEH 2012).

This separation into subspecies is not supported by available genetic data (Elphinstone 2008, Roberts et al. 2011). The Action Plan for Australian Birds (Garnett et al. 2011) notes this, yet nevertheless 'recognises' the split proposed by Schodde and Mason (1999). However, the separation into subspecies has no formal status under state or Commonwealth legislation.

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 1994).

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

Proposed conservation status

Critically Endangered in Victoria

Criteria C2a(ii)

Species Information

Description and Life History

The Eastern Bristlebird is a small, well-camouflaged, ground-dwelling bird. It is dark cinnamon-brown above, with pale colouring around the eyes and base of the bill, an off-white chin and throat, and a rufous-brown panel on each wing. It is greyish-brown below, with an off-white centre to the belly. It has red to red-brown irises, an off-white to pinkish-white gape, and pinkish-brown legs and feet (Higgins and Peter 2002). The body length is between 18 and 21 centimetres with the broad tail accounting for about half the bird's length. Adults weigh approximately 42 grams (range 35-50 g) (Higgins and Peter op. cit.). The wings are small (23 to 24 cm wingspan), and the legs are long and strong. The sexes are alike, but females are slightly smaller than males. Juveniles are similar to the adults, but can be identified, if viewed at close range, by their pale brown or brown irises, and pale yellow gape (Higgins and Peter 2002).

Population densities within suitable habitat are low compared to those of other heathland birds with maximum densities of four birds/10ha recorded at Barren Grounds Nature Reserve (Baker 1998). In the Howe Flat population, 1.5-2 birds/10ha were recorded (Bramwell 2008).

Generation Length

The generation length of the Eastern Bristlebird is estimated to be 4 to 6 years. This is based on Garnett et al. (2011). Banding records indicate that birds are capable of surviving to more than four years of age (Higgins and Peter 2002) and the longevity of birds that survive to maturity is probably at least six years (Holmes 1998).

Distribution

Eastern Bristlebirds have contracted to four genetically isolated populations in three disjunct areas of south-eastern Australia: south-eastern Queensland/north-eastern NSW (northern population), the Illawarra and Jervis Bay regions of eastern NSW (central populations), and the NSW/Victorian border coastal region (southern population). The southern population is found in the Nadgee Nature Reserve of NSW and Croajingolong National Park, east of Mallacoota Inlet in Victoria. Each of the geographically separate regional populations is comprised of one or more disjunct local populations or colonies. Limited evidence suggests that Eastern Bristlebirds in the northern population are morphologically distinct from the more southerly populations. Northern birds have previously been considered a distinct subspecies, *Dasyornis brachypterus monoides*, while central and southern populations comprise the nominate subspecies *Dasyornis brachypterus brachypterus*. However, recent genetic analysis does not support sub-speciation (OEH 2012).

Habitat

The Eastern Bristlebird inhabits a broad range of vegetation communities with a variety of plant species compositions that are generally defined by a similar structure of low, dense, ground or understorey vegetation. The taxon occupies fire-prone habitats and its response to fire is highly variable, however, the Eastern Bristlebird is particularly vulnerable to large-scale, intense fires. The extent, intensity and frequency of fires are all important in determining habitat suitability, along with the presence of unburnt refuges (OEH 2012). In Victoria, the birds have been recorded in Riparian Scrub areas and in Wet Heathland areas across and north of Howe Flat.

Threats

The main threat to the Eastern Bristlebird is the loss or fragmentation of suitable habitat, which can be caused by inappropriate fire regimes and clearing for urban or agricultural development. Habitat loss is recognised as the main process that has reduced the distribution and abundance of the Eastern Bristlebird in the last 150 years. Predation is a potential threat to the taxon, particularly by feral predators and particularly after fire. Other threats include habitat degradation from feral animals and livestock and invasion of weeds, genetic bottlenecks and inbreeding, climate change and human disturbance (OEH 2012).

The 2019/20 bushfire are believed to have burnt nearly 60% of the taxon's modelled habitat, with more than 40% burnt at high intensity. It impacted the northern part of Wet Heathland habitat and came within two kilometres of the Howe Flat population. This prompted emergency rescue of 15 individuals to Melbourne Zoo. These birds were kept in captivity for two months before seven birds were released back into Howe Flat on April 1st 2020. The fires also burned suitable Eastern Bristlebird habitat near Benedore River, where a planned translocation had been scheduled for March 2020 (although in light of the recent scale of the bushfires, it is now noted that Benedore River may have been too close to Cape Howe to act as an insurance population from large fires).

Of the 15 birds rescued, seven were returned two months later. As of July 2020 there currently two remaining at the Zoo, and six are believed to have died from a lung disease (aspergillus), exacerbated by stress related to capture and temporary holding. Preliminary results from a genetic assessment of the 15 birds captured indicated the Cape Howe population has reduced genetic diversity and high degrees of relatedness between individuals. Any future large fires, or decrease in the genetic diversity of the Victorian birds are likely to bring the taxon to the brink of extinction.

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 A3 as Endangered

The population reduction over the next 12 to 18 years is projected to be 5 to 100% (midpoint 50), based on (b) and (c) above.

The population should remain stable if there is active management intervention, including control of feral Cats and Red Foxes and consideration when developing fire regimes. However the limited genetic diversity, small numbers and the likelihood of another catastrophic fire could lead to significant decline. Without management intervention there could be a decline of up to 50% in the next twenty years, or if there was a further catastrophic fire, and in the absence of a second secure "insurance" population, the entire Victorian population could be lost.

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 B1 as Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 346 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is inferred to be severely fragmented. It is presumed that some level of gene flow is still possible via dispersing juveniles, however the national recovery plan (OEH 2012, p. 23) notes the following: “The national Eastern Bristlebird population has become severely fragmented. Fragmentation and isolation may be adversely affecting regional populations. Smith (1977) considered that the specialised habitat requirements of the Eastern Bristlebird prevented remnant populations from expanding. This is compounded by the limited amount of extant habitat available to the species. The dispersal potential and the need for dispersal corridors are unknown. Fragmented small populations are prone to deleterious genetic consequences related to their lack of genetic variability. The extent of this effect on populations of the bristlebird is unknown.

“The history and ecology of the species strongly suggest that as populations become small and fragmented, local extinctions ensue quickly. Some local populations are now so small in the north (only a few birds or pairs of birds in each) that young produced may not physically be able to find birds from other local populations to pair up with. Without augmentation in numbers in these locations to allow this pairing to happen, these sub-populations will not persist. Fragmentation of habitat and isolation of populations can also occur on a smaller scale as a result of the construction or maintenance of public roads and utility corridors. Where possible further habitat loss should be avoided and regeneration of habitat on unused tracks should be undertaken.”

On this basis, it can be considered that there are several small isolated subpopulations that are all at risk from the identified threats, such that there is increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It is estimated to have 3 locations. It has a continuing decline in (i), (ii), (iii) and (iv) above.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 71 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, the taxon is severely fragmented, has 3 locations and has a continuing decline in (i), (ii), (iii) and (iv) 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 Criticality Endangered

It is estimated that there are 150 to 170 mature individuals. In 1998, the southern population appeared to be stable (Baker 1998) with the prospect of the Nadgee subpopulation naturally increasing provided that there were no large-scale fires or other disruptions. The current estimate is 380 birds in an area of about 2800 ha. This includes estimated populations of 250 birds at Nadgee NR and 120- 140 birds in Riparian Scrub across Howe Flat. In 2009, a range extension into heathlands two to four kilometres north of Howe Flat in Croajingolong NP was recorded, increasing that population by an estimated 20-30 birds (M. Bramwell pers. comm. 2020, OEH 2012).

There is an inferred continuing decline, and the percentage of mature individuals in one subpopulation is 90 to 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 Endangered

The taxon is estimated to have 150 to 170 mature individuals. In 1998, the southern population appeared to be stable (Baker 1998) with the prospect of the Nadgee subpopulation naturally increasing provided that there were no large-scale fires or other disruptions. The current estimate is 380 birds in an area of about 2800 ha. This includes estimated populations of 250 birds at Nadgee NR and 120- 140 birds in Riparian Scrub across Howe Flat. In 2009, a range extension into heathlands two to four kilometres north of Howe Flat in Croajingolong NP was recorded, increasing that population by an estimated 20-30 birds (M. Bramwell pers. comm. 2020, OEH 2012).

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

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