Threatened Species Assessment

Ninox connivens
Barking Owl

Taxonomy

Ninox connivens (Latham, 1801)

Current conservation status

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

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

Proposed conservation status

Critically Endangered in Victoria

Criterion C2a(ii)

Species Information

Description and Life History

The Barking Owl is a medium-sized brown owl with white spots on the wings and a streaked breast. It has large, brilliant yellow, forward-directed eyes in an indistinct facial mask. The forehead, crown, nape and facial mask are various shades of brown, whilst the throat may be brown, white or white streaked with brown. The upper parts of the wings and back are brown with large white spots. The taxon attains a length of 35-45cm, a wing span of 85-100cm, and a weight of 425- 510g (Hollands 1991). It has a dog-like barking call, and will occasionally emit a blood-curdling screech, likened to that of a 'screaming' or 'wailing' woman (Schodde and Mason 1980, Hollands 1991, E. McNabb pers. comm.).

The Barking Owl is an obligate hollow-nester, and pairs, which usually mate for the life of a partner, may re-use the same nest hollow for many years (Robinson 1994). Preferred hollows are usually large, with entrance diameters between 25-45cm, and internal depths of 20-250cm (Schodde and Mason 1980). The taxon nests between July and October (Robinson 1994), usually producing two or three eggs that take approximately 36 days to hatch (Hollands 1991). The young frequently remain with the parents until the following autumn or winter. Breeding success is apparently variable and probably low (Robinson 1994). The Barking Owl takes a variety of vertebrate and invertebrate prey, the proportions of which appear to vary in relation to the breeding season of the species; mainly insects are taken outside of the breeding season, and more birds and mammals are taken during the breeding season. European Rabbits are the dominant prey for some southern populations (Hollands 1991, Robinson 1994); however, some populations rarely take Rabbits (Higgins 1999). Other important prey species include Sugar Glider *Petaurus breviceps*, Squirrel Glider *P. norfolcensis*, Common Brushtail Possum *Trichosurus vulpecula*, rodents, Lesser Long-eared Bat *Nyctophilus geoffroyi* and a range of birds, including Common Starling *Sturnus vulgaris*, Magpie *Gymnorhina tibicen*, Eastern Rosella *Platycercus eximius* and Blue Bonnet *Northiella haematogaster* (Hollands 1991, Kavanagh et al. 1995, Kirsten and Taylor 1995). Waterbirds such as grebes (Podicipedidae) are also taken (E. McNabb pers. comm.). Barking Owls sometimes begin hunting before dark and continue after dawn, presumably taking diurnal prey such as birds at these times. The taxon is also known to call during daylight hours (E. McNabb pers. comm.). The Barking Owl defends a small territory within a much larger home range (Schodde and Mason 1980). Home range estimates vary from approximately 100 to 1 000ha (Schodde and Mason 1980, Robinson 1994).

Generation Length

The generation length of the Barking Owl is estimated to be 5 to 8.5 (midpoint 6.8) years (P. Menkhorst pers. comm.)

Distribution

The Barking Owl occurs in New Guinea and adjacent islands and mainland Australia, where an endemic race (*N. c. connivens*) occupies a disjunct distribution throughout much of the continent, although it is absent from the arid, treeless expanses of Western Australia, Northern Territory, Queensland and South Australia.

Within Victoria, the taxon has been recorded from scattered localities throughout the state, although it is largely absent from unforested areas such as the volcanic plains and the semiarid north-west. The taxon predominantly occurs in the 400-700 mm rainfall zone north of the Great Dividing Range (Emison et al. 1987).

Habitat

Within Victoria the Barking Owl occurs in open woodlands and open forests, including Box Ironbark and riparian River Red Gum *Eucalyptus camaldulensis* habitats, as well as some foothill habitats on granitic slopes. The taxon has been recorded more frequently in edge habitats such as the interface between woodlands and wooded farmland, than in forest interiors (Robinson 1994, Kirsten and Taylor 1999). This perceived preference is likely to be due to the foraging behaviour of the taxon, the abundance of European Rabbits *Oryctolagus cuniculus* (a common prey item), and possibly the preponderance of larger, hollow-bearing trees (HBTs) on freehold land compared to public forests (Robinson 1994). Hydrological features such as rivers and swamps are often a conspicuous component of Barking Owl habitat (Kavanagh et al. 1995, Taylor et al. 1999). Live hollow-bearing trees are favoured for nesting over dead ones in Victoria, and species used include: Red Box *E. polyanthemos*, Grey Box *E. microcarpa*, White Box *E. albens*, Apple Box *E. bridgesiana,* Red Stringybark *E. macrorhyncha*, River Red Gum and Blakely's Gum *E. blakelyi* (Robinson 1994)

Threats

The primary threat to the Barking Owl in Victoria is loss of habitat, particularly the deterioration or loss of the large HBTs on which the taxon depends for nesting. Hollows suitable for nesting for owls do not form in eucalypts until they are at least 150-200 years old (Parnaby 1995). Similarly, hollows are an important resource for many prey species of the Barking Owl, e.g. gliders and possums. Such trees are not being regrown rapidly enough to exceed expected losses in the current century. The removal of dead, standing trees and stags for firewood is also likely to remove nesting sites for the taxon (E. McNabb pers. comm.). Native prey species such as arboreal mammals and hollow-nesting birds have declined in some areas through clearing of native vegetation, loss of hollows and the impact of introduced predators. These declines may also have contributed to the decline of the Barking Owl, although in some areas European Rabbits have become a substitute prey, and local populations of the Barking Owl have become heavily dependent upon them. It is not known how the owls will fare through periods of Rabbit decline due to climate fluctuations, control programs or disease such as calicivirus. Where poisons are used to control Rabbits, secondary poisoning of owls may be an issue.

Inappropriate fire regimes pose a threat to Barking Owl habitat. Barking Owls occur on the perimeter of woodlands and forest close to human habitation, and consequently that is where fuel reduction efforts are targeted. Numbers of Owls decline significantly with increases in fire frequency and intensity which affect habitat, especially large old HBTs, and the prey base which also depends on HBTs. The preferred habitat is not inherently fire dependant or bushfire prone, and consequently the impact of fuel reduction burning is greater.

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 Vulnerable

The population reduction over the past 15 to 25 years is inferred to be 10 to 30%, based on (a) and (c) above.

This is based on incremental small declines in native vegetation cover and quality across the state.

Eligible under Criterion A3 as Endangered

The population reduction over the next 15 to 25 years is projected to be 30 to 55%, based on (c) above.

There will be a significant future decline if inappropriate fire regimes continue and affect potential Barking Owl habitat, notably HBTs and the prey base which also depends on HBTs. The Eldorado Bushfires of 2002-2003 saw a reduction in the state stronghold of Barking Owls of 60% over a period of less than 12 months following bushfire. "With the current extent of decline, BOs may be extinct from Chiltern Mt Pilot within 30 years" (Schedvin 2008). But numbers have since stabilised and the trend reversed, but possibly in the short term. If there are further droughts and increasing bushfires, further declines are expected.

Eligible under Criterion A4 as Endangered

The population reduction over any 15 to 25 year period, including both past and future (up to 100 years in the future), is estimated to be 25 to 50%, based on (a) and (c) above. The causes of reduction may not have ceased, be understood or be reversible.

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:

Ineligible under Criterion B

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 217,567 km² and the Area of Occupancy (AoO) is estimated to be 2,750 km², both of which exceed the thresholds for criterion B.

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 200 to 300 mature individuals. Surveys were undertaken throughout North East (NE) and Goulburn-Broken Catchment Management Authority (CMA) areas, in localities considered to be suitable

habitat, and no Barking Owls were detected in Goulburn-Broken CMA. Less than 25 breeding pairs were detected in NE CMA, which Taylor and Kirsten (1999) identified as the hotspot for Barking Owls in Victoria. No Barking Owls were found in the Goulburn River hotspot from targeted surveys (Birdlife Australia pers. comm.)

The number of mature individuals is observed to continue to decline, and the percentage of mature individuals in one subpopulation is 95-100 %.

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

It is estimated that there are 200 to 300 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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