Threatened Species Assessment

Ninox strenua
Powerful Owl

Taxonomy

Ninox strenua Gould 1838

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1994).

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

Proposed conservation status

Vulnerable in Victoria

Criterion C2a(ii)

Species Information

Description and Life History

The Powerful Owl belongs to the family Strigidae (or Hawk owls) which are characterised by bright-yellow, large, forward-directed eyes. It is the largest owl found in Australia, with an overall head-tail length of 60-65cm. The male is larger than the female. Adults are mottled dark grey-brown above and white below with bold grey-brown chevrons (chest barrings); legs are feathered to the tarsus (shins), with dull yellow feet. Immature birds (owlets) are whiter, having paler back and wings, a whiter face with dark eye-patches and sparse fine dark streaks and faint barring on the flanks. The Powerful Owl is an opportunistic, nocturnal hunter that preys mainly on arboreal or semi-arboreal marsupials (DSE 2003). It is a generalist, preying on the most available prey at a given site and in a given season. The main component of the Powerful Owl diet across its range is Ringtail Possum, this may be supplemented by other arboreal possums and gliders depending on the geographic location and prey present, e.g. Greater Glider, Brushtail Possum, Sugar Glider, Yellow-bellied Glider (Cooke et al. 2002). Birds, insects and vegetation comprise only a small part of the diet and ground dwelling mammals are rarely taken (Kavanagh 2002).

Generation Length

The generation length of the Powerful Owl is estimated to be 8 to 9 years. This is based on the congener Barking Owl and derived from calculations in the 2010 Bird Action Plan (Garnett et al. 2011).

Distribution

The Powerful Owl has been recorded from most of Victoria with the exception of the drier north-west and most riverine Red Gum forests, although surveys have recorded Powerful Owls occurring in Red Gum plains along the Ovens River. In the wetter mountain forest habitats, it appears to be replaced by the Sooty Owl. Dispersing juveniles have been recorded inhabiting woodland plain (DSE 2003). Powerful Owls are widespread in the coastal forests where they especially favour gullies with peppermint-Manna Gum forests (annual rainfall 800-1000 mm). They are occasionally seen in wetter mountain forests, drier Box Ironbark forests and woodlands and softwood plantations (Emison et al., 1987).

Habitat

Pairs occupy a large, probably permanent, home range in mountain forests, gullies and forest margins; sparser hilly woodlands; coastal forests, woodlands, scrubs; exotic pine plantations; and large trees in private/public gardens in some cities (Pizzey and Knight, 2012).

Throughout its range, the Powerful Owl generally favours dense gullies for roosting and breeding sites. It prefers older forests where large tree hollows provide nesting sites and arboreal prey items are plentiful (DSE 2003).

Threats

A major threat to the Powerful Owl is a loss of suitable large hollow bearing trees. This loss has a direct impact on the availability of nest sites and also reduces habitat that supports arboreal marsupials which comprise the majority of the owl's diet. Processes such as bushfire, planned burning and clearing of vegetation may lead to the direct loss of habitat trees or changes to the surrounding forest structure which may compromise the value of nest sites. The 2019-20 bushfires are believed to have impacted more than 25% of the taxon's modelled habitat, although the degree of damage is yet to be determined.

Changes to forest structure may also reduce the availability of habitat for prey species such as Possums. Continual forest disturbance may also compromise the growth of replacement old growth (150+ years) trees which may never reach full maturity. Loss of canopy vegetation may expose mature eucalypts and render nesting sites unsuitable. Widespread and frequent planned burning may thin out thickets of vegetation that support Ringtail Possums and other prey.

Spatial analysis of likely habitat for Powerful Owl indicates that 43% occurs within the CAR reserve system, including parks and reserves, special protection zones and areas excluded from harvesting by prescription under the Victorian Code of Practice for Timber Production 2014 (the Code). Species-specific protections for the Powerful Owl are included in the Code. Other more general prescriptions also provide protection from timber harvesting. In recent years, modified harvesting and forest regeneration practices have been implemented in native forest that are designed to further mitigate the potential threat from forestry operations to threatened species and their habitats.

Land use changes from residential or industrial development around the eastern fringe of Melbourne may reduce Powerful Owl habitat. Intensification of agricultural activities resulting in the clearance of suitable habitat can be detrimental to Powerful Owls (SWIFFT 2019).

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

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 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 165,018 km² and the Area of Occupancy (AoO) is estimated to be 6,261 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 Vulnerable

It is estimated that there are 3,000 to 6,000 mature individuals. The taxon has a very broad distribution and a wide range of habitats.

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

Degradation of forest ecosystems by inappropriate fire regimes including extensive bushfires and the associated ongoing loss of hollow-bearing trees are expected to continue to reduce the total population in Victoria.

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:

Ineligible under Criterion D

It is estimated that there are 3,000 to 6,000 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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