Threatened Species Assessment

Oxyura australis
Blue-billed Duck

Taxonomy

Oxyura australis Gould, 1837

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

Vulnerable in Victoria

Criterion C2a(ii)

Species Information

Description and Life History

The Blue-billed Duck is a small, compact duck with a large round head and a short neck (Marchant and Higgins 1990). It is about 40 cm in length and has a weight of about 850g. Male and female Blue-billed Ducks have different plumages. The adult breeding male has a black head with a chestnut to brown body and wings and a distinctive blue bill. Its non-breeding, or eclipse, plumage is similar to that of the adult female. The adult female is medium grey in colour with lighter barring to the head and body feathers, with the breast being lighter in colour. It has a dark bill. Immature birds are generally indistinguishable from adult females (DuGuesclin 2003). Blue-billed Ducks are in the tribe of stiff-tailed ducks whose tail feathers are spiny in appearance and capable of being raised (Frith 1977). It is the only member of the genus *Oxyura* in Australia. This genus is cosmopolitan and contains six species, four of which (including the Blue-billed Duck) are under some threat.

Generation Length

The generation length of the Blue-billed Duck is estimated to be 6 years, as indicated in Garnett et al. (2011, p. 25) and supported by a similar figure in BirdLife International (2018). This is similar to congeners in this diving duck group.

Distribution

Blue-billed Ducks are endemic to south-eastern and south-western Australia. The species is widespread in Victoria, most commonly reported in the southern Murray-Darling Basin area. The highest concentrations in eastern Australia are from southern Victoria. The majority of Blue-billed Ducks are found on artificial wetlands, for example the main site for the species in Victoria is the Western Treatment Plant at Werribee.

Habitat

Blue-billed Ducks prefer deep water in large permanent wetlands and swamps with dense aquatic vegetation. The taxon is completely aquatic, swimming low in the water along the edge of dense cover. It readily flies if disturbed, but prefers to dive if approached.

The taxon will feed by day far from the shore (particularly if dense cover is available in the central parts of the wetland). They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects

such as the larvae of midges, caddisflies and dragonflies. Blue-billed Ducks are secretive, preferring stable, deep, fresh well-vegetated wetlands for much of the year, particularly for breeding. These swamps often contain rushes or sedges but lignum *Muehlenbeckia* spp. or Melaleuca swamps are also used. In winter, flocks congregate on large, open, fresh to saline wetlands, including artificial areas such as sewage ponds when local populations may be supplemented by influxes of other birds, which may consist of largely juvenile and immature birds. Occasionally large flocks have been observed during summer (A. Corrick pers. comm. 2003). Breeding and wintering areas are often shared with similar species (Marchant and Higgins 1990). Blue-billed Ducks are partly migratory, with short-distance movements between breeding swamps and overwintering lakes with some long-distance dispersal to breed during spring and early summer (NSW Office of the Environment and Heritage 2018).

Threats

Since European settlement, much of the taxon's preferred habitat of deep freshwater marshes has disappeared or been modified by drainage, clearing, grazing, increased salinity and groundwater extraction (Marchant and Higgins 1990). There are only 25 (Victorian) wetlands at which more than 100 Blue-billed Ducks have been recorded at any one time in surveys conducted since 1987 (DELWP VBA - Summer Waterfowl Count data). Even though the taxon is rare it has regularly featured in the list of most frequently shot non-game taxa. Increasing salinity in significant areas of the state could in the future modify some deep freshwater areas thereby reducing their suitability as preferred habitat. Therefore, both habitat loss and habitat degradation are significant threats.

Duck hunting poses a moderate threat to Blue-billed Ducks due to disturbance and the risk of illegal or accidental shooting. Lead from lead shot (now banned in Victoria since 2005) is also a threat to the taxon (SAC 1995, DuGuesclin 2003). In a study by Norman et al. (1993) in Victoria, elevated lead levels were found in 23.1% of liver samples from Blue-billed Ducks. Since the general phase out of lead shot, the threat to waterfowl from lead poisoning has declined (DuGuesclin 2003). The taxon appears to be susceptible to disturbance and has a high Flight Initiation Distance (Stamation et al. 2016).

The impact of European Carp (*Cyprinus carpio*) on Blue-billed Duck preferred habitat is uncertain. Their feeding and spawning behaviour may modify these areas and cause them to be unsuitable for large numbers of Blue-billed Ducks as well as other taxa. The activities of commercial fishers, particularly eel fishers, may impact on the taxon. Fyke nets used for eel fishing are known to catch Blue-billed Ducks as well as other waterbirds. The use of mesh nets may also cause problems (DuGuesclin 2003).

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 216,543 km² and the Area of Occupancy (AoO) is estimated to be 3,312 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 4,000 to 10,000 (midpoint 6,000) mature individuals. BirdLife International (2018) gives an Australian population figure of up to 12000 mature individuals, however the data quality is described as 'poor'. Survey data for Victoria has a wide range of figures. Counts of waterbirds on Victoria's wetlands over five years (1988-1991) indicated the Blue-billed Duck population could be at least 1600 in Victoria (Peter 1991). A more recent analysis of 73 counts between the years 2000 - 2012 at the Western Treatment Plant wetlands at Werribee found an average of 4078 Blue-billed Ducks. In 2013 in excess of 10,000 Blue-billed ducks were recorded in this area (Loyn et al. 2014).

It has been noted that Blue-billed Ducks tend to congregate at the Western Treatment Plant wetlands in drought years when habitat across their range becomes unsuitable. They tend to disperse in years when other wetlands hold more suitable water levels. The Victorian Summer Waterbird Counts demonstrate how the population count can vary. The 2011 Victorian Summer Waterbird Count only recorded 15 Blue-billed Ducks (Purdey and Loyn 2013). The 2012 Victorian Summer Waterbird Count recorded 845 Blue-billed Ducks. The 24 year long-term average of Blue-billed Ducks in the Victorian Summer Waterbird Counts is 3779 (Purdey and Loyn 2013).

The 2014 and 2015 summer waterfowl counts found the Port Phillip Region (i.e. Western Treatment Plant) held most of the Blue-billed Ducks counted across Victoria (98.3% in 2014; 92.2% in 2015) (Purdey and Menkhorst 2015).

In Victoria there are only 25 wetlands which have records of 100 or more Blue-billed Ducks. There are only 17 wetlands in Victoria where Blue-billed Ducks have been recorded breeding. The highest counts at coastal Victorian drought refuges include 13 000 at Western Treatment Plant, Werribee after 2000 (Garnett et al. 2011).

If the populations on artificial wetlands/treatment ponds (especially the Western Treatment Plant) were excluded, a more accurate reflection of Blue-billed Duck status in natural habitats would emerge, where flocks in excess of 90 birds are uncommon and many wetlands support less than 10 birds.

The number of mature individuals is estimated to continue to decline, based on the supposition that the total Blue-billed Duck population may be as low as 10,000 and monitoring suggesting it may be declining by as much as 10% within 3 generations (18 years) (Garnett et al. 2011).

The percentage of mature individuals in one subpopulation is 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:

Ineligible under Criterion D

It is estimated that there are 4,000 to 10,000 (midpoint 6,000) mature individuals.

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

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