# Threatened Species Assessment

## *Botaurus poiciloptilus*
## Australasian Bittern

### Taxonomy

*Botaurus poiciloptilus* (Wagler, 1827)

### 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 1997).

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 Australasian Bittern is a large, stocky, thick-necked, heron-like bird. The birds grow to a length of 66-76 cm and have a wingspan of 1050-1180 cm. The average male weighs approximately 1400 g and the average female weighs approximately 900 g (Marchant and Higgins 1990). The upper-parts of the body are brown and dark brown to black, mottled and buff, in complex patterns that aid the bird's concealment in swamp vegetation. The underparts of the body are streaked and scalloped, brown and buff. They have a prominent black-brown stripe running down the side of the neck, the eyebrow is pale, and the chin and upper throat are white. The bill is straight, pointed and straw yellow to buff in colour with a dark grey ridge. The legs and feet are pale green to olive and the eyes are orange-brown or yellow (Marchant and Higgins 1990, Pizzey and Knight 1997). Darker and paler variants of the plumage have been observed in adults. Juveniles are generally paler than adults and have heavier buff flecking on the back (Marchant and Higgins 1990, Pizzey and Knight 1997).

#### Generation Length

The generation length of the Australasian Bittern is estimated to be 5 to 7 years. The Eurasian bittern (*Botaurus stellaris*) has a mean age at first breeding of two years and a maximum longevity in the wild of 11.3 years, while the American bittern (*B. lentiginosus*) has a maximum longevity of 8.3 years. Extrapolating these values to the Australasian Bittern and using an extrapolated mean annual survival of 68% based on other heron genera, the estimated generation length is 5.5 years (BirdLife International 2016).

#### Distribution

The Australasian Bittern occurs from south-east Queensland to south-east South Australia, Tasmania and in the south-west of Western Australia (Marchant and Higgins 1990). The population can be divided into two subpopulations, the south-eastern and south-western subpopulations. The taxon is widespread in New South Wales and Victoria. In NSW, it occurs along the coast and is frequently recorded in the Murray-Darling Basin, notably in floodplain wetlands of the Murrumbidgee, Lachlan, Macquarie and Gwydir Rivers. In Victoria, it has been recorded mostly in the southern coastal areas and in the Murray River region of central northern Victoria (Marchant and Higgins op cit.).

### Habitat

Australasian Bitterns inhabit shallow, vegetated freshwater or brackish swamps, favouring those dominated by sedges, rushes and/or reeds (Marchant and Higgins 1990). They have also been more recently recorded in rice paddies in the Murray Darling basin, which may now be a breeding stronghold for the taxon (Herring et al. 2019). They feed on fish, eels, frogs, freshwater crayfish and aquatic insects (Heather and Robertson 1997, Menkhorst 2012). They appear to disperse widely, including to coastal wetlands during periods of drought and to ephemeral wetlands when wet (e.g. Peter 2015). During years of extensive flooding, there may be a short to medium term increase in population (Marchant and Higgins 1990).

Movements of the taxon are poorly understood. It is known to respond to flooding of ephemeral inland wetlands, presumably sometimes from coastal refuges. Recent satellite tracking work indicates that a large portion of the Riverina rice crop breeding population disperses to coastal wetlands after harvest (Peter 2015), while others stay local. It may therefore be partially migratory, may have evolved to breed largely in inland wetlands (many of them temporary) and to spend the non-breeding season in more reliably watered southerly sites, including the wetlands associated with Victorian estuaries (which increase in area when river mouths close during drought).

### Threats

Bitterns are threatened by diversion of water for irrigation, drainage of permanent and ephemeral swamps for agriculture or urban development, reduced water inflows and salinisation (Kingsford 2000). Overgrazing by stock and inappropriate fire regimes can also reduce habitat suitability (Marchant and Higgins 1990). A key emerging threat is the impacts of climate change. Franklin et al. (2014) noted that 'of greater concern is the exposure of specialists of shallow, permanent, vegetated wetlands in southern Australia, such as the Australasian Bittern and Australian Little Bittern.'

## 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 21 years is inferred to be 30 to 45%, based on (b) and (c) above.

Garnett et al. (2011) noted that: 'The reporting rate in BirdLife Australia's Atlas surveys has decreased from being recorded in 260 10-minute grid squares in 1977-1981, to 142 squares in 1998-2003, and 61 in 2003-2008. The reporting rate declined by >90% in Tas and WA, and by 63% in the Riverina. The long-term rate of decline is estimated to be 20-30% over 2 generations (11 years), so could arguably be of the order of 30-45 years for three generations.'

Based on this information, and knowledge that habitat loss has been severe in Victoria, it is likely the Victorian population has declined by at least this figure (and probably more).

| 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 B2 as Vulnerable**

The Area of Occupancy (AoO) is estimated to be 1,692 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

It is inferred to have two to five locations. It has a continuing decline in (i), (ii), (iii) and (v) above. The declines are primarily linked to the clearing or modification of wetlands for urban and agricultural development, as well as the extraction of water from wetlands for irrigation (TSSC 2011).

| 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 70 to 100 mature individuals. The number is uncertain as no species-specific bittern surveys undertaken on any bittern species in the past. However, BirdLife Australia estimated the number of adult birds in 2009-2010 to be 86-248 in Victoria. Assuming a 25-50% decline in the last thirty or so years, it is feasible to assume there are now between 70 and 100 birds, possibly less, since in some (very dry) years Victoria would have only a very small number of Australian Bitterns (e.g. <10). This is in line with what is occurring in NSW and elsewhere in eastern Australia.

The number of mature individuals is projected to continue to decline, and the percentage of mature individuals in one subpopulation is 90-100 %.

| 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<br>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 70 to 100 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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