

# NSW SCIENTIFIC COMMITTEE

## Australasian Bittern *Botaurus poiciloptilus*

Review of Current Information in NSW

November 2009

### Current status:

The Australasian Bittern *Botaurus poiciloptilus* (Wagler 1827) is currently listed in Victoria as 'Threatened' under the *Flora and Fauna Guarantee Act 1988* (Endangered on Advisory List), 'Vulnerable' in South Australia under the *National Parks and Wildlife Act 1972* and 'Rare or Likely to become Extinct' in Western Australia under the *Wildlife Conservation Act 1950*. The species is not listed under Commonwealth legislation. The NSW Scientific Committee recently determined that the Australasian Bittern meets criteria for listing as Endangered under the NSW *Threatened Species Conservation Act 1995* (TSC Act), based on information contained in this report and other information available for the species.

### Species description:

The Australasian Bittern is a moderately large (70 cm in length) heron-like wetland bird with mottled and streaked brown plumage, which provides camouflage in its reedbed habitat. The species has a dark streak down each side of the neck, a pale throat, and olive legs. The juvenile Nankeen Night Heron *Nycticorax caledonicus* is similar in appearance, but is more striped on the foreparts, with rows of white spots on the wings, and yellow legs. The Black Bittern *Ixobrychus flavicollis* is smaller and darker, with a streaked throat. The species is partly nocturnal and cryptic but may be recognised during breeding by the male's deep booming calls.

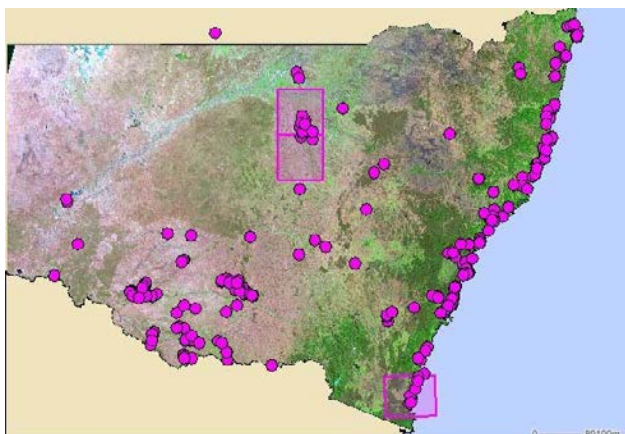
### Taxonomy:

Species: *Botaurus poiciloptilus* (Wagler 1827) (Ardeidae), monotypic (*i.e.* no subspecies); an endemic Australasian species whose range includes New Zealand.

### Distribution and number of populations:

The Australasian Bittern occurs in three regions: south-eastern Australia from the Queensland border to south-east South Australia, south-west Western Australia, and Tasmania. These regions are inferred to support three subpopulations. Australasian Bitterns in NSW form a part of the south-eastern subpopulation and are found in the better-watered landscapes in the east and south of the state (Figure 1).

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**Figure 1.** Records of the Australasian Bittern since 1980 (NSW Wildlife Atlas).

## **Ecology:**

The ecology of the Australasian Bittern is poorly understood as there are no detailed studies on this species (Marchant & Higgins 1990).

### Key habitat requirements

The Australasian Bittern inhabits temperate freshwater wetlands and occasionally estuarine reedbeds. The species favours permanent shallow wetlands, or edges of pools and waterways, with tall, dense vegetation such as sedges, rushes and reeds on muddy or peaty substrate. Australasian Bitterns also occur in lignum and canegrass on inland wetlands.

### Breeding biology

The Australasian Bittern builds a platform of reeds and rushes just above water, in deep cover of a tall dense stand of reeds or rushes. A clutch of up to four to five eggs may be laid in spring to summer, although limited information is available. Breeding habitat and nest sites can be subject to loss by drainage or redirection of environmental flows.

### Diet

The Australasian Bittern feeds on animals of wetland and edge including, fish, eels, crayfish, frogs, insects, snakes, lizards and occasionally small birds and mammals. Plant matter can also form part of the diet. The species' food supply and foraging habitat can be depleted by drainage of wetlands and redirection of environmental flows.

### Social biology

The Australasian Bittern occurs solitarily or in pairs, or sometimes in small groups during the non-breeding season.

### Territoriality/home range

Breeding pairs of Australasian Bitterns are solitary and territorial, occupying relatively large home range of 40-50 ha and therefore occurring at low densities. The large home range suggests that food resources may be limited for this species, although data are lacking for ecologically

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similar species such as other Australian herons and bitterns, some of which defend feeding territories. Many other herons are colonial nesters; the solitary White-faced Heron *Egretta novaehollandiae* has a foraging range of several hectares per day, and neighbouring nests of the solitary Striated Heron *Butorides striata* may be only 60-80 m apart (Marchant & Higgins 1990).

## Generation length

The generation length of the Australasian Bittern is estimated as five years, with low reliability. (Garnett & Crowley 2000).

## Ability to disperse/susceptibility to population fragmentation

The Australasian Bittern is thought to be sedentary in permanent habitat. However, the species can also be irruptive and dispersive in response to changing water levels and is suspected to make short-range seasonal (post-breeding) movements. Despite limited information, it is inferred that juveniles, and in some climatic conditions (e.g. flood or drought years), adults may disperse (Marchant & Higgins 1990).

## **Number of mature individuals:**

The number of individuals nationally has been estimated as 2 500 (Garnett & Crowley 2000; Wetlands International 2006). This estimate is assigned a low level of reliability. Birdlife International (2009) has suggested that the Australian population may be even lower than this, given the recent severe reduction in habitat and breeding grounds, and provides an estimate for of not more than 1 000 mature individuals.

Around a half to two-thirds of the national population is estimated to occur in NSW on the basis of geographic range and the distribution of suitable wetland habitat. Assuming as an upper limit that two-thirds of the national population occurs in NSW, and based on an estimate of between 1 000 and 2 500 mature individuals, the plausible range of the number of mature individuals in NSW is roughly 660 to 1 660.

## **Threats:**

The Australasian Bittern's inland habitat is subject to diversion of water for irrigation, and salinisation and drainage of permanent swamps (Garnett & Crowley 2000; Olsen & Weston 2004). Coastal habitats are under intense pressure from housing, rural-residential and other developments (R. Jaensch in Olsen & Weston 2004).

Half of the wetland habitats in NSW have been lost or degraded since European settlement (Olsen & Weston 2004), and the size of wetland areas has decreased significantly at four of ten sites in eastern Australia over 24 years from 1982 to 2006 (Nebel *et al.* 2008). Major floodplain wetlands in the Murray-Darling Basin have had up to a 60% reduction in flow, and consequently 40-77% of their area has been destroyed or degraded over the past century (Kingsford & Thomas 2004; Kingsford & Porter 2009).

Coastal wetlands have been destroyed or degraded by drainage, alteration of the floodplain and urbanisation (Pressey 1989; Adam 1995; Finlayson & Rea 1999). Ten of the 22 NSW coastal

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catchments have more than 10% of their area under intensive agriculture, and less than 20% of coastal wetland areas are protected under formal reservation or SEPP 14 (a policy to ensure that the NSW coastal wetlands are preserved and protected in the environmental and economic interests of the State) (Kingsford *et al.* 2004). Coastal wetlands are considered among the most threatened Australian wetlands (Olsen & Weston 2004) with 25-30% of the Australian coastline subject to increasing development, mostly in the south-east, with a 95% increase in the human population in the non-metropolitan coastal zone between 1971 and 1991 (White *et al.* 1999). In NSW, the area of coastal freshwater wetlands destroyed ranges from *c.* 30% in the Hunter to South Coast regions, 60% on the Cumberland Plain and 70% on the far south coast, to more than 90% in the Tweed and Clarence Valleys, with much of the remainder fragmented, degraded and under continuing threat (NSW Scientific Committee 2004).

‘Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands’ is listed as a Key Threatening Process in NSW under the *Threatened Species Conservation Act* 1994.

In addition, fox predation, climate change (resulting in decreased rainfall) and grazing and burning of wetland habitats may also be potential threats to the species.

## **Extreme fluctuations:**

There is no evidence of extreme fluctuations in the global population of Australasian Bitterns, although the species’ irruptive nature would alter local population size.

## **Population reduction and continuing declines:**

In recent decades, the Australasian Bittern is believed to have undergone a reduction in population size in NSW, based on comparative evidence from broadscale surveys. The species was reported in 32 one-degree grids in the first national bird atlas in 1977-1981, at low to high reporting rates (Blakers *et al.* 1984), and 30 grids in the second national bird atlas in 1998-2002, at low reporting rates (Barrett *et al.* 2003). Its index of abundance (reporting rate) declined by 25% in NSW between the two atlases over 20 years (*i.e.* four generations), with no variation between bioregions (Barrett *et al.* 2007). This is a non-significant trend ( $P = 0.229$ ), owing to the small sample size of records ( $n = 50$  atlas units). Ecologically similar species (*i.e.* those occupying well-vegetated wetland margins) have shown significant declines in NSW (White-faced Heron 27%,  $P = 0.002$ , 278 atlas units; Latham’s Snipe *Gallinago hardwickii* 24%,  $P = 0.044$ , 96 atlas units: Barrett *et al.* 2007), or nationally (Nankeen Night Heron 17%,  $P = 0.04$ , 274 atlas units: Barrett *et al.* 2003). For some of these species, and other ecologically similar species with smaller samples, the decline in NSW was non-significant (Nankeen Night Heron 25%,  $P = 0.192$ , 164 atlas units; Baillon’s Crake *Porzana pusilla* 20%,  $P = 0.393$ , 38 atlas units; Spotted Crake *Porzana porzana* 19%,  $P = 0.31$ , 54 atlas units). Another wetland species, the Australian Painted Snipe *Rostratula benghalensis*, was recorded too infrequently to compare atlas trends, but it has declined in its core range in the Murray-Darling Basin to the point that it is now recognised as Endangered in NSW and nationally (C. Tzaros in Olsen & Weston 2004).

Reduction over many years of suitable wetland habitat has also potentially impacted populations of the Australasian Bittern. The Lowbidgee (confluence of the Lachlan, Murrumbidgee and

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Murray Rivers), which is a core habitat area for the Australasian Bittern (Figure 1) has shown significant declines in shorebird populations over 19 years to 2001, and waterbirds (all functional groups, including large wading birds, *i.e.* herons and others, and ducks) also declined by over 90% (Kingsford & Thomas 2004). Over 15 years to 2007, aerial surveys have found that in eastern Australia total numbers of waterbirds have declined by *c.* 75%, breeding index has declined by *c.* 90%, and the abundance of common indicator species (Grey Teal *Anas gracilis* and Australian Pelican *Pelecanus conspicillatus*) has declined by *c.* 75% and 67%, respectively (Kingsford & Porter 2009).

## **Extent of Occurrence (EOO) & Area of Occupancy (AOO):**

The species' estimated national EOO is 1 000 000 km<sup>2</sup>, with high reliability, and the national AOO is estimated to be 1 200 km<sup>2</sup>, with low reliability (Garnett & Crowley 2000). The AOO given by Garnett & Crowley (2000) apparently applies to wetland areas only (and is unlikely to be calculated using 2 x 2 km cells). Based on these figures from 2000, and considering that a half to two-thirds of the species distribution is thought to occur in NSW, the EOO of the species in NSW is thus estimated to be between 500 000 and 660 000 km<sup>2</sup>, and the AOO is estimated to be between 600 and 800 km<sup>2</sup>. However, as a result of loss of wetland habitat since 2000, it is likely that these figures will now be lower.

## **Severe fragmentation:**

There is inferred to be a low level of genetic exchange between the three Australian subpopulations (Garnett & Crowley 2000). However, like other waterbirds, the species appears capable of irruptive and dispersive movements, so genetic exchange within subpopulations is likely, even if some areas of habitat are fragmented. Thus, severe population fragmentation is unlikely for this species.

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## Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au).

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2009) Australasian Bittern, *Botaurus poiciloptilus*. Review of current information in NSW. November 2009. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.