Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

1. Name

Botaurus poiciloptilus

The species is commonly known as the Australasian Bittern. It is also known as the Boomer, Bullhead, Bunyip, Black–backed or Brown Bittern. It is in the Family Ardeidae**.**

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list the Australasian Bittern. The nominator suggested listing in the endangered category of the list.

This is the Committee's first consideration of the species under the EPBC Act.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 1 to make it **eligible** for listing as **endangered**.

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 3 to make it **eligible** for listing as **endangered**.

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 4 to make it **eligible** for listing as **vulnerable**.

The highest category for which the species is eligible to be listed is **endangered**.

4. Taxonomy

The species is conventionally accepted as *Botaurus poiciloptilus* (Wagler, 1827) (Australasian Bittern).

5. Description

The Australasian Bittern is a large, stocky, thick–necked, heron–like bird. The species grows to a length of 66–76 cm and has 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 under-parts of the body are streaked and scalloped, brown and buff. The species has 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).

6. National Context

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 sub–populations, the south–eastern and south–western sub–populations.

The Australasian Bittern is listed as: vulnerable under the New South Wales *Threatened Species Conservation Act 1995*; vulnerable under the South Australian *National Parks and Wildlife Act 1972*; vulnerable under the Western Australian *Wildlife Conservation Act 1950*; and threatened under the *Victorian Flora and Fauna Guarantee Act 1988*.

In Queensland, the Australasian Bittern occurs in the far south–east and has been identified as far north as Baralaba and west to Wyandra. However, it is mainly known from a few coastal swamps and its Queensland distribution is now likely to be restricted to protected areas in the Cooloola and Fraser regions (Marchant and Higgins, 1990; Jaensch, pers. comm., 2005).

The species 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 (Marchant and Higgins, 1990; NSW National Parks and Wildlife Service, 1999; Jaensch, pers. comm., 2005). Aggregations of Australasian Bitterns consistently occur at wetlands such as Fivebough Swamp (Leeton, NSW), where habitat is actively managed for this species and is supplemented by nearby ricefields (FTWMTI, 2002). In Victoria, it is recorded mostly in the southern coastal areas and in the Murray River region of central northern Victoria (Jaensch, pers. comm., 2005).

In Tasmania, the Australasian Bittern was formerly widespread, and was most numerous in the east of the state (Marchant and Higgins, 1990). It is now absent from some major wetlands that have dried out and is confined to coastal regions in the north–east and on the islands of the Bass Strait (Marchant and Higgins, 1990; Garnett and Crowley, 2000).

In South Australia, the Australasian Bittern is confined to the south–east, ranging north to the Murray River corridor and west to the southern Eyre Peninsula, and Kangaroo Island. It is most numerous in the swamps in the south–east of the state, such as Bool Lagoon (Marchant and Higgins, 1990; Jaensch, pers. comm., 2005).

In Western Australia, the Australasian Bittern was formerly widespread in the south–west, ranging north to Moora, east to near Mount Arid, and inland possibly as far as the Toolibin Lake area. However, this range declined throughout the 1900s. It is now likely that it only occurs on the western coastal plain between Lancelin and Busselton, in the southern coastal region from Augusta to the east of Albany and inland to some wetlands in the jarrah forest belt, with small, isolated populations in swamps from west of Esperance eastwards to near Cape Arid (Marchant and Higgins, 1990; Jaensch, pers. comm., 2005). The largest concentration of the species occurs in the Lake Muir wetlands complex (Jaensch and Vervest, 1988; Jaensch et al., 1988).

Vagrants have been recorded from farther north, including one record from Argyle Downs in the extreme north–east of Western Australia (Marchant and Higgins, 1990).

The Australasian Bittern also occurs in New Zealand and New Caledonia (Marchant and Higgins, 1990).

7. Relevant Biology/Ecology

The Australasian Bittern is generally solitary, but sometimes occurs in pairs or dispersed aggregations of up to 12 birds. It is likely to be sedentary in permanent habitats, but some individuals may make regular short distance movements during winter, and occasional movements to inland areas have been recorded during extensive flooding (Marchant and Higgins, 1990; Jaensch, pers. comm., 2005).

In eastern Australia, the Australasian Bittern occurs in discrete wetlands or wetland clusters in some parts of its range, most notably in the south–east of South Australia and into western Victoria, and in coastal areas in general. In the inland regions it can inhabit vast floodplain wetland systems, although these are now effectively reduced to small areas of remnant habitat, except in particularly wet years (Jaensch, pers. comm., 2005).

The Australasian Bittern occurs mainly in freshwater wetlands in the temperate southeast and south–west of Australia and, rarely, in estuaries or tidal wetlands (Marchant and Higgins, 1990). It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. *Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus*) or cutting grass (*Gahnia*) growing over a muddy or peaty substrate (Marchant and Higgins, 1990).

The Australasian Bittern breeds from October to February in single solitary pairs. Sometimes, however, several nests may be placed in close proximity to each other (Marchant and Higgins, 1990). The species nests in relatively deep, densely vegetated freshwater swamps and pools, building its nests under dense cover over shallow water (Marchant and Higgins, 1990). The species prefers vegetation that is up to 2.5 m tall and the nests are placed about 30 cm above the water level (Marchant and Higgins, 1990). In rushland, it may avoid breeding in the densest areas (Marchant and Higgins, 1990). If population densities are high, it may resort to open wetlands for nesting, such as in stunted Acacia swamps (Marchant and Higgins, 1990). Clutch size is usually four or five, but ranges from three to six (Serventy and Whittell, 1976; Marchant and Higgins, 1990).

The Australasian Bittern appears to be capable of moving between habitats as suitability changes. It can occur in high densities in temporary or infrequently filled wetlands during exceptionally wet years, and will also use ephemeral wetlands when moving from areas that are drying out (Garnett, 1992).

In areas affected by water regulation which has reduced the variation of water flow into wetlands, some species such as the Australasian Bittern have increased in numbers in some areas due to newly created areas of suitable habitat. However, overall this has not had a significant effect on the total population size of the species.

With the reduction in suitable natural wetland habitat, the species has been known to utilise artificial habitats such as rice fields. However, given the reduction in rice production in Australia in recent years this is less common.

The age of maturity of the Australasian Bittern is estimated to be one year and the life expectancy is estimated to be 11 years. These figures are based on figures for *Botaurus stellaris* (Eurasian Bittern). The generation length for the species is estimated to be 5.5 years.

8. Description of Threats

The major threat to the Australasian Bittern in Australia is the reduction in extent and quality of habitat, due to the diversion of water away from wetlands (primarily for irrigation as well as groundwater extraction), peat mining and the drainage of swamps (Marchant and Higgins, 1990; Kingsford and Thomas, 1995; Garnett and Crowley, 2000; Kingsford, 2000; Jaensch, 2004). Over the past 100 years, many suitable wetland sites in both eastern and south–western Australia have been lost because of the alteration of habitat (Jaensch, pers. comm., 2005).

In eastern Australia, cessation of floodplain inundation due to water harvesting and alteration of drainage systems has destroyed much of the Australasian Bittern's seasonal habitat (Jaensch, 2004). Many of the Murray–Darling wetlands are no longer available or are rarely available for use by the species due to river regulation and water harvesting for irrigation (Jaensch, pers. comm., 2005). For example, there has been a 70 per cent reduction in large water flows to the Gwydir Wetlands, NSW. As a consequence, the Gwydir Wetlands now only floods five per cent of the time compared to a previous 17 per cent of the time (Kingsford, 2000). In addition, the Macquarie Marshes have reduced in size by 40–50 per cent as a result of a 21 per cent decline in the flow of water to the wetland (Kingsford, 2000).

The clearing of wetlands for urban development or agriculture has also had a significant impact on the species. In Queensland, clearing of coastal wetlands for urban development,

particularly around the Sunshine Coast, has greatly reduced the species' area of occupancy. In NSW, much of the Gwydir Wetlands has been cleared and converted for agriculture, leaving only very small areas of suitable habitat (Jaensch, pers. comm., 2005).

Because of its comparatively specialised habitat requirements (i.e. densely vegetated wetlands), the species is more sensitive to habitat loss than many other wetland birds (Garnett and Crowley, 2000). Although many sites occupied by Australasian Bitterns are now protected, the species continues to be threatened by ongoing habitat loss. While broadscale clearing of habitat for urban development may have declined, the coastal zone in Australia is still subject to intense and escalating pressure from housing, semi–rural and other developments (Jaensch, 2004).

Reduced water quality due to increased salinity, siltation and pollution is having an ongoing impact on the species' habitat. In south–western Australia, salinisation of inland swamps as a result of land clearing has excluded the Australasian Bittern from many inland locations (Jaensch, 2004). For example, Yarnup Swamp in the Muir–Unicup wetlands is no longer used by the Australasian Bittern due to increased salinity levels since the mid 1980s. Siltation at the mouth of the Snowy River has caused the back flow of saline water which has destroyed the species' reedbed habitat in Lake Corringle in Victoria. Consequently the Australasian Bittern is no longer found at this location (Birds Australia, 2009). Pollution in wetlands is likely to cause a decline in many of the prey species of the Australasian Bittern, such as eels, freshwater crayfish and frogs which in turn may have a negative effect on bittern populations' health and numbers (Marchant and Higgins, 1990).

Overgrazing by livestock and the associated frequent or intense burning of wetland areas reduces the dense vegetation that forms the core habitat of the Australasian Bittern (Birds Australia, pers. comm., 2009).

The Australasian Bittern is also subject to the predation of eggs and juveniles by foxes (*Vulpes vulpes)* and cats (*Felis catus*) (Garnett and Crowley, 2000). Foxes are known to predate on ground-nesting birds across the range of the Australasian Bittern (NSW National Parks and Wildlife Service, 2001), and the impact of foxes on young chicks of the similar species, the Eurasian Bittern, has been well documented (Taylor et al., 2006).

9. Public Consultation

The nomination was made available for public exhibition and comment for 30 business days. No comments were received.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **endangered** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

Based on survey data from 2010, the total population of the Australasian Bittern in Australia is estimated to be between 250 and 800 individuals (Birds Australia, unpublished data., 2010). Data from 2008 indicate that the species' area of occupancy may have declined by over 50 per cent over the past three generations or 16.5 years (Birds Australia, pers. comm., 2009). This is based on evidence that there has been a 46 per cent decline in the area of occupancy from 1981 to 1997 (three generations) and further declines over the 10 year period to 2008 (Birds Australia, pers. comm., 2009). These declines in the area of occupancy are based on only two points in time, and it is likely that the species distribution fluctuates naturally in accordance with drought cycles. Nevertheless, collectively these figures suggest

an ongoing decline and are significant in that the species has narrow habitat requirements and is predominately solitary in nature.

The main threats affecting this species, as outlined above in Section 8, have not ceased and there is no evidence that they are abating. In particular, the clearing or modification of wetlands for urban and agricultural development, as well as the extraction of water from wetlands for irrigation are ongoing threats to this species. Although many sites occupied by the Australasian Bittern are now protected, the species continues to be threatened by ongoing habitat loss. While broadscale clearing of habitat for urban development may have declined, the coastal zone in Australia is still subject to intense and escalating pressure from housing, semi–rural and other developments (Jaensch, 2004). As well as the clearing of wetlands, water extraction in eastern Australia has destroyed much of the species' seasonal habitat in the Murray–Darling basin (Jaensch, 2004). In addition, current climate modelling indicates that annual temperatures appear to be increasing and rainfall decreasing across Australia where this species is found, placing further stress on this species (CSIRO, 2010).

Therefore, the threats affecting this species, and the causes of the decline, have not ceased and are likely to continue to reduce the area of occupancy of the species leading to a further decline in population numbers. The Committee considers that the species is suspected to have undergone a severe reduction in numbers. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 1 to make it **eligible** for listing as **endangered**.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

The Australasian Bittern's extent of occurrence is approximately 1 234 000 km^2 and the species occurs in New South Wales, Victoria, Tasmania, South Australia and Western Australia. However, based on the suitable habitat now available within this extent, the area of occupancy is estimated to be approximately 1150 km^2. The Committee considers that the species' geographic distribution is limited.

Data from 2008 indicate that over the 31 years from 1977 to 2008, the area of occupancy of the species has declined by 70 per cent. This data also indicates that the species' area of occupancy may have declined by over 50 per cent over the past three generations or 16.5 years (Birds Australia, pers. comm., 2009). This decline in the area of occupancy is as a result of a variety of threats as outlined above in Section 8. The species' distribution is fragmented across Australia, nevertheless the species is naturally dispersive allowing an exchange of genetic material between these fragmented populations. However, the south–western population is likely to have no or little genetic exchange with the south–eastern population given the large distance between these populations. As a result, the Committee considers that the species' geographic distribution is limited but not precarious for the survival of the species. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 2, it is **not eligible** for listing in any category under this criterion.

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either

(a) evidence suggests that the number will continue to decline at a particular rate; or

(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

Based on survey data from 2010, the total population of the Australasian Bittern in Australia is estimated to be between 250 and 800 individuals (Birds Australia, unpublished data., 2010). The Committee considers that the total number of mature individuals is low for the purposes of this criterion.

Data from 2008 indicate that the species' area of occupancy may have declined by over 50 per cent over the past three generations or 16.5 years (Birds Australia, pers. comm., 2009). This is based on data that there has been a 46 per cent decline in the area of occupancy from 1981 to 1997 (three generations) and further declines over the 10 year period to 2008 (Birds Australia, pers. comm., 2009). This represents an ongoing decline in the area of occupancy greater than 20 per cent over two generations of the species leading to a further decline in population numbers. Given that the threats that caused this decline have not ceased and there is no evidence that they are abating, the decline in species numbers is expected to continue at least at this rate in the future and is considered high for the purposes of this criterion.

The Committee considers that the estimated total number of mature individuals of the species is low for the purposes of this criterion and that evidence suggests that this number will continue to decline at a high rate. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 3 to make it **eligible** for listing as **endangered**.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

Based on survey data from 2010, the total population of the Australasian Bittern in Australia is estimated to be between 250 and 800 individuals (Birds Australia, unpublished data., 2010). The Committee considers that the total number of mature individuals is low for the purposes of this criterion. Therefore, the species has been demonstrated to have met the relevant element of Criterion 4 to make it **eligible** for listing as **vulnerable**.

Criterion 5: Probability of extinction in the wild that is at least

(a) 50 per cent in the immediate future; or

(b) 20 per cent in the near future; or

(c) 10 per cent in the medium–term future

There are no data available to estimate a probability of extinction of the species in the wild over a relevant timeframe. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Conservation Status

Botaurus poiciloptilus (Australasian Bittern) was nominated for inclusion in the list of threatened species referred to in section 178 of the EPBC Act. The nominator suggested listing in the endangered category of the list.

The Committee considers that the species is suspected to have undergone a severe reduction in population numbers as a result of the reduction in the species' area of occupancy and the loss of habitat and breeding grounds. Data from 2008 indicate that the species' area of occupancy may have declined by over 50 per cent over the past three generations or 16.5 years. Given that the threats affecting this species, and the causes of the decline, have not ceased and are likely to continue to reduce the area of occupancy of the species, this is likely to lead to a further decline in population numbers. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 1 to make it **eligible** for listing as **endangered**.

The Committee considers that the estimated total number of mature individuals of the species is low and that evidence suggests that the number will continue to decline at a high rate. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 3 to make it **eligible** for listing as **endangered**.

The Committee considers that the total number of mature individuals is low for the purposes of this criterion. Therefore, the species has been demonstrated to have met the relevant element of Criterion 4 to make it **eligible** for listing as **vulnerable**.

The highest category for which the species is eligible to be listed is **endangered**.

Recovery Plan

There should be a recovery plan for this species as it occurs across multiple state boundaries and requires a complex suite of recovery and threat abatement actions in terms of addressing threats, such as water management in the Murray–Darling Basin. In addition, the implementation of recovery and threat abatement actions will involve a wide variety of land managers and other stakeholders across these state boundaries.

12. Recommendations

(i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the **endangered** category:

Botaurus poiciloptilus

(ii) The Committee recommends that there should be a recovery plan for this species.

Associate Professor Robert J.S. Beeton *AM FEIANZ*

Chair

Threatened Species Scientific Committee

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