

## Rapid Communication

# Serious contractions in wintering distribution and decline in abundance of Baer's Pochard *Aythya baeri*

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### Summary

Observed maximum numbers of Baer's Pochard *Aythya baeri* in China, the traditional core wintering range, declined from 16,792 during 1987–1993 to 2,131 during 2003–2011, accompanied by a dramatic contraction in range. Coordinated coverage of the most important sites in the middle and lower Yangtze River floodplain in January 2011 found only 194 Baer's Pochard. The reported wintering population outside China declined from 719 in 2000–2005 to 48 in 2006–2010. The world population in 2011 apparently did not exceed 1,000 individuals, and the true number was most likely many fewer. The species seems to have ceased wintering regularly outside mainland China, where none had been found by mid-February 2012 despite coverage of favoured sites. Urgent, coordinated actions are needed to protect this species which may soon be on the verge of extinction in the wild.

### Introduction

Baer's Pochard *Aythya baeri*, classified as "Vulnerable" by IUCN after a long-term sharp decline in numbers from 1994 (Kear 2005), was re-designated "Endangered" in 2008 because of declines in wintering numbers from 10,000–25,000 (Callaghan and Green 1993, Rose and Scott 1997, Miyabayashi and Mundkur 1999) to < 5,000 (BirdLife International 2011). The species formerly bred in the Amur and Ussuri River basins of far eastern Russia and north-east China and wintered in eastern and southern China (the core wintering area; Cheng 1979), India, Bangladesh and Myanmar (BirdLife International 2011). A complete census of the Yangtze River floodplain and eastern coasts found 850 individuals in the early 2000s (Cao *et al.* 2008a), confirming declines there, thought to be due to habitat loss and hunting (Lu 1993, MacKinnon *et al.* 1996). We present information on the current winter distribution and abundance of Baer's Pochard since 2000 and review changes in its distribution and abundance in China since 1986.

### Methods

#### *Spatial and temporal coverage*

We updated BirdLife International's (2001) review of the distribution of wintering Baer's Pochard before 2000 by compiling data collected since then from Bangladesh, Cambodia, India, Japan, Laos, Myanmar, Nepal, Republic of Korea, Thailand, Taiwan, Vietnam, Hong Kong and mainland China (range states that have previously supported the species). We present count data from eastern and southern mainland China collected since 1986. Recent coordinated surveys of the historically most important winter sites for Baer's Pochard on the Yangtze River floodplain and Huai River floodplain

were carried out in 2004 and 2005 and were repeated by the State Forestry Administration and WWF China in January 2011 (Cao *et al.* 2008b; see Figure S1 in the online Supplementary Materials for a map showing the lakes and sites throughout the Yangtze River floodplain). Elsewhere in China, the Yellow River wetlands are invariably frozen in winter and other areas less intensively surveyed yielded few sightings, although several lakes in Yunnan and Guizhou provinces are significant for wintering waterbirds (Liu 1997).

### *Data compilation*

We compiled a database using records from the Asian Waterbird Census (AWC) (Li *et al.* 2009), other literature and web resources, and from key experts in all the range states. From these we present maximum annual national counts for 1999/2000 to 2004/05 and for 2005/06 to 2010/11 from all range states (excluding China). Within China, we supplemented these sources with data from surveys, reports and other publications, including the national waterbird survey 1988–1993 (Waterbird Specialist Group of Chinese Ornithological Association 1994), China Bird Reports, China Birdwatch, and internet resources (e.g. <http://www.birdtalker.net> in Chinese). We only included winter counts from November to March to generate maximum annual counts for each province in each of three periods: 1987/88 to 1992/93, 1993/94 to 1998/99, and 2002/03 to 2010/11.

## **Results and Discussion**

### *Changes in distribution and abundance in China*

Of 180 records of wintering Baer's Pochard in China, 51 counts came from 1986/87 to 1992/93, 53 from 1993/94 to 1998/99, and 76 from 2002/03 to 2010/11 (Table 1). The totalled provincial annual counts for each period suggest a dramatic decline in numbers and a severe contraction in range (Table 1). During 1986/87 to 1992/93 large flocks were reported from several provinces, but by 1993/94 to 1998/99, large flocks were only reported from Hunan Province, and substantial numbers only reported from Anhui Province in 2002/03 to 2010/11, where they were concentrated at Wuchang and Fengsha Lakes, and Liangzi Lake in Hubei (Table S1 in online Supplementary Materials). Only 194 Baer's Pochards were observed during an extensive survey of the middle and lower Yangtze River floodplain in January 2011. Special surveys of Liangzi Lake by the Wuhan Bird-watching Society and visits to Wuchang Lake (Anhui) and Baiquan (Wuhan) during winter 2011/12 failed to produce a single record before 10 February 2011. However, we failed to find this decline in periodic compilation from 2002/03 to 2010/11 (Table S2 in online Supplementary Materials), even though there were extensive coordinated surveys in all periods. We believe that in recent years, the more frequent and complete surveys in Anhui and Hubei Provinces lead to a better detection of this species.

### *National counts outside China*

Totalled annual maximum counts from all range states outside China fell from 719 in 1999/2000 to 2004/05 to 48 in 2005/06 to 2010/11 (Table 2). Regular coverage at key former wintering sites and casual observations from many potentially suitable sites suggest that few Baer's Pochards have wintered outside China at all in the six years up to and including 2010/11. Bangladesh supported 3,000 birds in 1996, but only 20–30 have been reliably reported in recent years (P. Thompson *in litt.*) and in India (where over 1,400 were counted in 1995 and 1997) the species has almost ceased to appear (maximum 3 individuals) in the Asian Waterbird Census (AWC) reports (Li *et al.* 2009). There were no records from Myanmar in January 2006 and 2007, compared to 129 in 2001 and 500–1,000 during the 1990s (Li *et al.* 2009). In Thailand, Baer's Pochard was still regularly seen in the 1990s (e.g. 596 counted in 1998; Li *et al.* 2009), but has virtually disappeared, with annual total counts of fewer than five in the last four years (P. Round *in litt.*). In Laos, Baer's Pochard has not been recorded in suitable habitats in the last 10 years (W. Duckworth *in litt.*, J. van der Ven *in litt.*). Although always rare historically in South Korea, the frequency of occurrence has also declined (N. Moores *in litt.*).

Table 1. Annual maximum counts of Baer's Pochard from each province of China, for each of three periods during 1986/87 to 2010/11. Summing provincial annual maxima across a series of years is likely to overestimate the true numbers present at any time, underlining the seriousness of the decline observed in these values. '-' indicates no records (either no survey or no birds) in that province; 1: Waterbird Specialist Group of Chinese Ornithological Association (1994); 2: Li and Jiang (1990); 3: Wang (2000); 4: D. Lee (*in litt.*); 5: Wang *et al.* (1998); 6: Goodwin (1987); 7: Scott (1989); 8: Li *et al.* (2009); 9: W. Liu (*in litt.*); 10: Lei and Yang (1999); 11: Su *et al.* (1998); 12: Miyabayashi and Mundkur (1999); 13: J. Thalund (*in litt.*); 14: Barter *et al.* (2004); 15: Wuhan Bird-watching Society, Lading, Musenlin@birdtalker.net; 16: field survey by J. Lei 2010/11; 17: China Ornithological Society (2004); 18: Tao Xudong, living@birdtalker.net; 19: field survey by Barter *et al.* (2005, 2008, 2010, 2011); 20: field survey by Barter *et al.* 04/2005; 21: Mcaribou@birdtalker.net; 22: Gudaoxifeng@birdtalker.net; 23: Musenlin@birdtalker.net; 24: Hexin17, Musenlin, sunny@birdtalker.net; 25: Jushu@birdtalker.net; 26: midway, Xiaobai@birdtalker.net; 27: Hongsun2@birdtalker.net; 28: Shuiqiongchu, mmchong, migrantsparrow@birdtalker.net; 29: Anon (2005); 30: Ba *et al.* (2003); 31: Cui *et al.* (1992); 32: Zhang (2007); 33: Wei (2008); 34: Zhang (2008).

Province	Period		
	1986/87 - 1992/93	1993/94 - 1998/99	2002/03 - 2010/11
Hubei	5,043 <sup>1,2</sup>	870 <sup>3</sup>	283 <sup>14,15,16</sup>
Hunan	1,366 <sup>1,3</sup>	1,350 <sup>10</sup>	23 <sup>17,18,31</sup>
Anhui	27 <sup>1</sup>	—	1,081 <sup>19</sup>
Jiangsu	6,357 <sup>1,3,4</sup>	483 <sup>11</sup>	8 <sup>20</sup>
Jiangxi	200 <sup>4</sup>	—	603 <sup>14,21</sup>
Shanghai	2 <sup>4</sup>	—	6 <sup>14</sup>
Zhejiang	—	—	1 <sup>22</sup>
Shandong	2,000 <sup>4</sup>	20 <sup>4</sup>	1 <sup>23</sup>
Henan	767 <sup>1,5</sup>	387 <sup>12,29</sup>	5 <sup>24</sup>
Jilin	200 <sup>4</sup>	—	—
Sichuan	250 <sup>4</sup>	81 <sup>4</sup>	70 <sup>25,32,33</sup>
Tianjin	360 <sup>4</sup>	160 <sup>4</sup>	1 <sup>17</sup>
Hebei	—	84 <sup>13</sup>	9 <sup>34</sup>
Beijing	44 <sup>6</sup>	—	4 <sup>26</sup>
Yunnan	18 <sup>4</sup>	—	—
Guangdong	51 <sup>1,7</sup>	—	—
Gansu	37 <sup>1</sup>	—	—
Liaoning	26 <sup>4</sup>	—	3 <sup>27</sup>
Xinjiang	—	3 <sup>4</sup>	—
Shaanxi	—	—	4 <sup>28</sup>
Hong Kong	30 <sup>8</sup>	1 <sup>8</sup>	4 <sup>29</sup>
Taiwan	14 <sup>9</sup>	33 <sup>9</sup>	25 <sup>9</sup>
Total	16,792	3,472	2,131

### Potential causes of the declines within China

Declines and range contractions of Baer's Pochard over the last 25 years in China mirror trends amongst several wintering waterbird species there (e.g. Fox *et al.* 2010, Zhang *et al.* 2010, Cong *et al.* 2011, Wang *et al.* in press Zhao *et al.* in press), although consistent data on distribution and abundance are patchy. In China, hunting and habitat loss are considered the major causes of decline amongst many wintering waterbirds (Cao *et al.* 2010). Between 336 and 4,803 Baer's Pochard (mean 1,630,  $n = 7$ ) were reported shot annually between 1981 and 1987 along just one section of Hong Lake, Hubei Province (Li and Jiang 1990), and according to an experienced local hunter, 3,000 individuals were hunted annually some years ago at Rudong and nearby area, just north of Shanghai (Lei *in litt.*), suggesting hunting mortality has contributed to local extinctions within China. Winter diet of these diving ducks is poorly known beyond water plants, grass seeds

Table 2. Annual maximum national counts of Baer's Pochard from all range states since 2000. Summing national annual maxima across a series of years is likely to overestimate the true numbers present at any time, underlining the seriousness of the decline observed in these values. \* indicates data from Asian Waterbird Census data until 2007, \*\* indicates results from Asian Waterbird Census data until 2002, – indicates no data available. Data sources are as follows: 35: Anon (2005); 36: P. Thompson (*in litt.*); 37: Japan Anatidae census; 38: Duckworth (2009); 39: N. Moores (*in litt.*).

Country	Period	
	2000–2005	2006–2011
Bangladesh	216 (in 2005) <sup>35</sup>	20–30 <sup>36</sup>
India	314 (in 2001) <sup>35</sup>	0 <sup>35,*</sup>
Japan	12 (in 2003) <sup>37</sup>	8 (in 2007) <sup>37</sup>
Laos	1 (in 2000) <sup>38</sup>	0 <sup>35,*</sup>
Myanmar	129 (in 2001) <sup>35</sup>	0 <sup>35,*</sup>
Nepal	30 (in 2001) <sup>35</sup>	0 <sup>35,*</sup>
Republic of Korea	1 (in 2001) <sup>35</sup>	2 (in 2009) <sup>39</sup>
Thailand	16 (in 2000) <sup>35</sup>	8 (in 2006) <sup>35,*</sup>
Vietnam	0 <sup>35</sup>	0 <sup>35</sup>
Bhutan	0 <sup>35,**</sup>	–**
Total	719	48

and molluscs (Qian and Zhu 1980, Zhuge 1990). Changing water chemistry, pollution, intensified fishery management, submerged macrophytes and the changing general ecology of many wetlands in the Yangtze River floodplain (e.g. Fang *et al.* 2006) have undoubtedly inflicted major habitat changes upon this species throughout China.

Wuchang, Fengsha and Liangzi Lakes are now of outstanding importance for Baer's Pochard as daytime roosting sites (Table S1). Day-long observations at Wuchang Lake in February 2010 and 11–13 January 2011 showed that they slept and rested well offshore, but never fed throughout daylight hours (pers. obs.). All birds departed at dusk for unknown feeding areas, along with Baikal Teal *Anas formosa*, Falcated Duck *A. falcata* and Pintail *A. acuta* and returned before dawn.

It is noteworthy that records in 2010/11 and 2011/12 indicate large fluctuations in numbers of Baer's Pochard at key sites such as Liangzi and Wuchang Lakes, which are well covered by experienced observers and active birdwatchers. These records suggest that Baer's Pochard is very mobile and shows limited site fidelity between winters. The absence of this species in extensive surveys at these key sites in 2011/12 (Cao *in litt.*, Lei *in litt.*) again emphasises the uncertainty of information on this species.

The quality and frequency of surveys in key sites have improved since 2000. Nevertheless, an assessment of other potential sites and targeted surveys for the species at those sites is a high priority, because surveys have so far been partially incomplete (even the very comprehensive ones in 2004, 2005 and 2011). Though other large catchments, such as the Yellow River catchment, may provide sites for this species, both freezing temperature and absence of observations by birdwatchers in winter indicate the low probability of finding this species there.

#### *Factors affecting Baer's Pochard outside the winter quarters*

Although Baer's Pochard have disappeared from many of their former winter quarters, widespread reductions have occurred simultaneously throughout its non-breeding range, suggesting that factors operating on the breeding grounds or associated with migration are also important. Outside China, the most dramatic declines occurred prior to 2000 but dramatic contractions in range and a conspicuous crash in numbers occurred in China after the early 1990s. Although it is too late to identify the factors responsible, it is a high priority to visit breeding areas to assess what remains of this now tiny and fragmented population, and to establish factors threatening survival and breeding outcomes.

The global reduction in the abundance and distribution of Baer's Pochard shows no sign of slowing or ceasing, and we have no understanding of the causes of these trends. Our results indicate that the world population of Baer's Pochard is far less than the 5,000 individuals estimated by BirdLife International in 2008 (BirdLife International 2011), and is most unlikely to exceed 1,000, and may be many fewer. Urgent and coordinated actions are needed to protect this species from extinction.

## Supplementary Materials

The supplementary material for this article can be found at [journals.cambridge.org/bci](http://journals.cambridge.org/bci)

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