

# Threatened Birds of Asia:

## The BirdLife International Red Data Book

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**Recommended citation**

BirdLife International (2001) *Threatened birds of Asia: the BirdLife International Red Data Book*. Cambridge, UK: BirdLife International.

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ISBN 0 946888 42 6 (Part A)

ISBN 0 946888 43 4 (Part B)

ISBN 0 946888 44 2 (Set)

British Library-in-Publication Data

A catalogue record for this book is available from the British Library

First published 2001 by BirdLife International

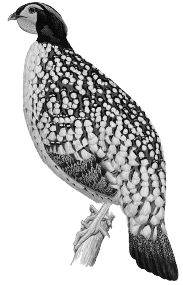
Designed and produced by the **Nature**Bureau, 36 Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ, United Kingdom

Available from the Natural History Book Service Ltd, 2–3 Wills Road, Totnes, Devon TQ9 5XN, UK. Tel: +44 1803 865913 Fax: +44 1803 865280 Email [nhbs@nhbs.co.uk](mailto:nhbs@nhbs.co.uk)  
Internet: [www.nhbs.com/services/birdlife.html](http://www.nhbs.com/services/birdlife.html)

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## CABOT'S TRAGOPAN

### *Tragopan caboti*



Critical  —

Endangered  —

Vulnerable  C1; C2a

*This species is listed as Vulnerable because it has a small population which is continuing to decline and become increasingly fragmented owing to the ongoing conversion of natural mixed forests to conifer plantations.*

**DISTRIBUTION** Cabot's Tragopan is endemic to the mountains of south-east China, where it is known from widely scattered localities in Zhejiang, Fujian (Wuyi Shan mountains), Jiangxi (Wuyi Shan and Jinggang Shan mountains), Hunan, Guangxi and Guangdong, with records (by province and autonomous region; see Remarks 1 and 2) as follows:

■ **CHINA** ■ **Zhejiang Gutian Shan Nature Reserve**, Kaihua county, undated (Liu Donglai *et al.* 1996); **Longyou county**, 1982–1987 (Zhuge Yang and Ding Ping 1988); **Qu Xian county** (Quzhou city), December 1983 (Zhuge Yang and Ding Ping 1988); **Jiangshan county**, undated (Li Xiangtao 1996); **Jinyun county**, 1982–1987 (Zhuge Yang and Ding Ping 1988); Lishui Forestry Station, **Lishui county**, breeding, April 1984 (Zhuge Yang and Ding Ping 1988); **Jiulong Shan Nature Reserve**, Suichang county, November 1983 (Zhuge Yang and Ding Ping 1988); **Yunhe county**, 1982–1987 (Zhuge Yang and Ding Ping 1988), one collected, undated, and feathers found at Wuxi, 1,000 m, 1986 (Zhang Zhengwang *in litt.* 1997); **Jingning county**, recorded during a survey in 1986, two males collected locally, undated (Zhang Zhengwang *in litt.* 1997); **Fengyang Shan National Nature Reserve**, Longquan and Qingyuan counties, undated (Liu Donglai *et al.* 1996), in Longquan county, one collected in 1943 and recorded during surveys in 1982–1987 (Zhuge Yang and Ding Ping 1988), possibly referring to Fengyang Shan reserve and/or other sites in the county; **Wencheng county**, 1982–1987 (Zhuge Yang and Ding Ping 1988); **Wuyanling Nature Reserve**, Taishun county, where detailed ecological studies of this species, including radio-tracking, have been carried out since 1982 (Zheng Guangmei *et al.* 1985, King and Zheng Guangmei 1988, Zhang Zhengwang and Zheng Guangmei 1990, Zheng Guangmei *et al.* 1990, Sun Yuehua and Zheng Guangmei 1991, Young *et al.* 1991, Ding Changqing and Zheng Guangmei 1993, Sun Yuehua 1995);

■ **Fujian Wuyi Shan Nature Reserve**, Jianyang, Chong'an and Guangze counties, at Guadun (Kuatun), in late autumn 1873 (Père David in La Touche 1925–1934), many collected between 1896 and 1912, including several clutches of eggs (Rickett and La Touche 1898, La Touche 1900, 1913, 1925–1934, Rickett 1900a, specimens in BMNH, MCZ and SMNS), and collected between 1920 and 1932 (13) and in February 1941 and October 1963 (Cheng Tso-hsin and Wu Mingchuan 1979, 15 specimens in ASCN and WUCN), collected at Qipanshi, September 1960 (male in SCICN), recorded in the reserve on four dates in May–June and September between 1986 and 1990 (Lewthwaite 1996) including on the road between Man Ting Shan Fang and Huanggang Shan (Wang Gang Shang), one, c.2,000 m, June 1986 (Viney 1986), two near Sangang, December 1987 (Jensen 1989), female, April–May 1993 (P. Alström, U. Olsson and D. Zetterström *in litt.* 2000), recorded from Chong'an county, July–November 1960 (seven specimens in SCICN and KIZCN) and Jianyang county, undated (Zheng Guangmei and Zhang Zhengwang 1993), possibly referring to Wuyi Shan reserve and/or other sites in this county; **Wanmulin Nature Reserve**, Jian'ou county, undated (Liu Donglai *et al.* 1996), recorded from Jian'ou county, undated (Zheng Guangmei and Zhang Zhengwang 1993), possibly referring to Wanmulin reserve and/or other sites in this county; **Shunchang**

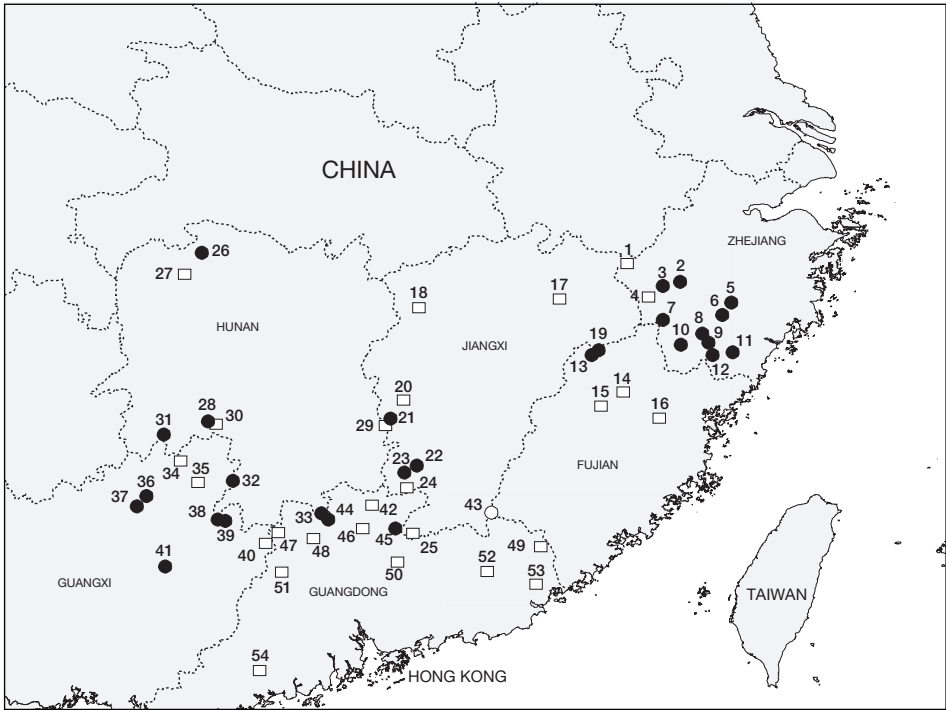
**county**, undated (Li Xiangtao 1996); **Gutian county**, undated (Li Xiangtao 1996); Yamakan, 12 km from Ching Fung Ling, hills 150 km north-west of Fuzhou, birds probably of this species reported by local people (Rickett 1900a); Fuzhou (Foochow) (not mapped), many obtained in or near the city, presumably originating from the hills inland, possibly including not far west of the city on the Yen-ping-fu hills (La Touche 1892, 12 specimens in ZMH, specimen in NEFUCN), collected along the “Yung Min” river “near Fuzhou”, March 1911, 80 km from Fuzhou, June 1911, 95 km from Fuzhou (two), April and June 1911 (four specimens in AMNH);

■ **Jiangxi Wannian county**, undated (Lu Taichun 1991); **Guan Shan Nature Reserve**, Yifeng county, undated (Liu Donglai *et al.* 1996); **Wuyi Shan Nature Reserve**, Qianshan county, undated (Liu Donglai *et al.* 1996), records from the “Wuyi mountains” presumably being from inside this reserve: 1,500 m, 1961 (one specimen in ASCN), “rare”, c.500 m, 1986 (Fu Daoyan and Ding Tieming 1986); **Yongxin county**, undated (Lu Taichun 1991); **Jinggang Shan Nature Reserve**, Jinggang Shan city, male and two females taken into captivity in 1982, and on Laogua Shan, Jinjingzhu Shan and Wuzhi Feng (all near Jinggang Shan) in 1983 (Yan Li 1984); **Shangyou county**, undated (Lu Taichun 1991), male and two females, 1,000 m, January 1999 (T. Woodward *in litt.* 2000); **Chongyi county**, undated (Lu Taichun 1991), female and two half-grown juveniles at the summit of Yang Ling, 1,250 m, September 1999 (T. Woodward *in litt.* 2000); **Dayu county**, undated (Lu Taichun 1991); **Jiulian Shan Nature Reserve**, undated (Liu Donglai *et al.* 1996);

■ **Hunan Huping Shan Nature Reserve**, Shimen county, undated (Liu Donglai *et al.* 1996), recorded from Shimen county in May–June 1990 (He Fenqi 1990), possibly referring to Huping Shan reserve and/or other sites in this county; **Tianmen Shan Nature Reserve**, Dayong city, undated (Liu Donglai *et al.* 1996); **Ziyun Wanfeng Shan Nature Reserve**, Xinning county, undated (Liu Donglai *et al.* 1996, Zhang Zhengwang *in litt.* 1997), recorded from Xinning county in June 1986 (Zhao Xiubi 1994), possibly referring to Xinhuang Shan and/or Ziyun-Wanfeng Shan reserves and/or other sites in this county; **Taoyuandong Nature Reserve**, Ling Xian county, undated (Liu Donglai *et al.* 1996), recorded from Ling Xian county, undated (He Fenqi *in litt.* 1993), possibly referring to Taoyuandong reserve and/or other sites in this county; **Shunhuang Shan Nature Reserve** (Xinhuang Shan Nature Reserve), Xinning county, undated (Liu Donglai *et al.* 1996, Zhang Zhengwang *in litt.* 1997); **Huangsang Nature Reserve**, Suining county, 1981 (Deng Xuejian 1993), recorded from Suining county in November 1982 (Zhao Xiubi 1994), possibly referring to Huangsang reserve and/or other sites in this county; **Qianjiadong Nature Reserve**, Daoxian county, one collected in 1984 (Deng Xuejian 1993); **Mang Shan Nature Reserve**, Yizhang county, November–December 1980 (three males in SCICN; also Liu Donglai *et al.* 1996), collected in Yizhang county (“in an area of 6,540 ha”, which is similar to the area of Mangshan reserve), 1,520 m, March–May 1992 (Liao Xiaodong 1993), possibly referring to Mangshan reserve and/or other sites in this county; Yanling (untraced), undated (Li Xiangtao 1996);

■ **Guangxi Mao’ershan Nature Reserve**, Ziyuan, Longsheng and Xing’an counties, undated (Guangxi Forestry Department 1993; also Liu Donglai *et al.* 1996); **Haiyang Shan Nature Reserve**, Quanzhou, Xing’an, Guanyang, Lingchuan and Yangshuo counties, undated (Wu Mingchuan 1993), recorded from Quanzhou, Guanyang, Lingchuan and Yangshuo counties, undated (Li Xiangtao 1996), possibly referring to Haiyangshan reserve and/or other sites in these counties; **Shoucheng Nature Reserve**, Lingui and Yongfu counties, undated (Guangxi Forestry Department 1993; also Liu Donglai *et al.* 1996), recorded in or near to this reserve at Donglingtun, Yongfu county, in 1982 (Wu Mingchuan 1993); **Sansuo Nature Reserve**, Rong’an county, recorded on Baizhu Shan in 1982 (Wu Mingchuan 1993, MacKinnon *et al.* 1996); **Yindian Shan Nature Reserve**, Gongcheng county, undated (Liu Donglai *et al.* 1996), three males and two females collected in or near to this reserve in Gongcheng county, 700–1,100 m, December 1978, including the type of the subspecies *T. c. guangxiensis* (Cheng Tso-

hsin and Wu Mingchuan 1979), and since then recorded at the following localities in this county: Yinding Shan, Damian Shan, and forests at Huangping, Dadi, Fenkaiyuan, Dongchang, Xiling and Heping on Yizi Shan (Wu Mingchuan 1993); **Xilingshan Shuiyuanlin Nature Reserve**, Fuchuan county, recently recorded in the reserve, and in or near to the reserve on Yangxi Shan and Laoxi Shan (Wu Mingchuan 1993; also Liu Donglai *et al.* 1996); **Huashuichong Nature Reserve**, He Xian county, undated (Guangxi Forestry Department 1993), recorded in or near this reserve in He Xian county at Gupo Shan, Shanmatangding, Guangxijie and Haodong, undated (Wu Mingchuan 1993); **Dayao Shan Nature Reserve**, Jinxiu county, male and female at Shangtangshan, 1,700 m, September 1998 (KFBG in prep. a);



**The distribution of Cabot's Tragopan *Tragopan caboti*:** (1) Gutian Shan Nature Reserve; (2) Longyou county; (3) Qu Xian county; (4) Jiangshan county; (5) Jinyun county; (6) Lishui county; (7) Jiulong Shan Nature Reserve; (8) Yunhe county; (9) Jingning county; (10) Fengyang Shan National Nature Reserve; (11) Wencheng county; (12) Wuyanling National Natural Reserve; (13) Wuyi Shan Nature Reserve; (14) Wanmulin Nature Reserve; (15) Shunchang county; (16) Gutian county; (17) Wannian county; (18) Guan Shan Nature Reserve; (19) Wuyi Shan Nature Reserve; (20) Yongxin county; (21) Jinggang Shan Nature Reserve; (22) Shangyou county; (23) Chongyi county; (24) Dayu county; (25) Jiulian Shan Nature Reserve; (26) Huping Shan Nature Reserve; (27) Tianmen Shan Nature Reserve; (28) Ziyun Wanfeng Shan Nature Reserve; (29) Taoyuandong Nature Reserve; (30) Shunhuang Shan Nature Reserve; (31) Huangsang Nature Reserve; (32) Qianjiadong Nature Reserve; (33) Mang Shan Nature Reserve; (34) Mao'ershan Nature Reserve; (35) Yindian Shan Nature Reserve; (36) Shoucheng Nature Reserve; (37) Sansuo Nature Reserve; (38) Yindian Shan Nature Reserve; (39) Xilingshan Shuiyuanlin Nature Reserve; (40) Huashuichong Nature Reserve; (41) Dayao Shan Nature Reserve; (42) Renhua county; (43) Longtoushan; (44) Babao Shan Nature Reserve; (45) Chebaling National Nature Reserve; (46) Qujiang county; (47) Lianshan county; (48) Yangshan county; (49) Dabu county; (50) Xinfeng county; (51) Huaiji county; (52) Wuhua county; (53) Chaozhou city; (54) Yangchun county.

○ Historical (pre-1950) ● Recent (1980–present) □ Undated

■ **Guangdong** Lechang county (Log-dsöng), where one in the market in c.1910 was possibly from the “Jautze mountains” south of the town (Mell 1922); Yuebei Chinese Tiger Nature Reserve, **Renhua county**, undated (Liu Donglai *et al.* 1996); **Longtoushan** (Drachenkopf), one of the “most characteristic birds”, undated (Mell 1922, Mell 1923–1925); **Babao Shan Nature Reserve**, Lechang and Ruyuan counties, pair, 1,000 m, June 1987 (Viney 1987), recorded several times in the 1990s in March–June and in December, with the highest count being 11 individuals over five days in May (Lewthwaite 1996; also Liu Donglai *et al.* 1996), male, April 1996 (L. Macauley *in litt.* 1999), recorded in or near this reserve at Wuzhishan, Ruyuan county, February 1968 (male in SCICN); **Chebaling Nature Reserve**, Shixing county, “rare resident”, with specimens in the reserve museum (Chen Wancheng *et al.* 1992, Lewthwaite 1996; also MacKinnon *et al.* 1996); **Qujiang county**, undated (Lu Taichun 1991); **Lianshan county**, undated (Lu Taichun 1991); Pingjiashan Nature Reserve, **Yangshan county**, undated (Zhang Zhengwang *in litt.* 1997); **Dabu county**, undated (Lu Taichun 1991); Yunji Shan Nature Reserve, **Xinfeng county**, undated (Liu Donglai *et al.* 1996); **Huaiji county**, undated (Lu Taichun 1991); **Wuhua county**, undated (Lu Taichun 1991); **Chaozhou city**, undated (Lu Taichun 1991); Chengjia Nature Reserve, **Yangchun county**, undated (Liu Donglai *et al.* 1996); “Gau-fung” (untraced), December c.1910 (Mell 1922); “Mahn-tsi-shan” (untraced), November c.1910 (Mell 1922); “Quellberg” (untraced), November–December c.1910 (Mell 1922).

**POPULATION** A survey of Cabot’s Tragopan in 1985–1986 estimated that there were c.4,000 individuals in the core of its range in Guangdong, Fujian, Zhejiang and Guangxi (Zheng Guangmei and Wang Qishan 1998). More recently, the total population throughout its range was estimated at c.5,000 birds (Zhang Zhengwang in McGowan and Garson 1995). However, given the lack of published information on its status at many of the localities where it has been recorded (see Distribution and Remarks 1), these estimates are presumably highly approximate. Its numbers are believed to be relatively stable inside protected areas, but generally declining at unprotected sites (Zhang Zhengwang *in litt.* 1997).

Its population density has been investigated at several sites, notably during a series of studies at Wuyanling Nature Reserve in Zhejiang. A one-year radio-tracking project of this species there revealed that it occupied home ranges of about 0.2–0.3 km<sup>2</sup> (Sun Yuehua and Zheng Guangmei 1991). Previous radio-tracking studies had estimated home ranges of 0.12–0.39 km<sup>2</sup> (average 0.24 km<sup>2</sup>) (Zheng Guangmei *et al.* 1990) and 0.029–0.20 km<sup>2</sup> (Young *et al.* 1991). Its population density in typical habitat has been estimated to be 7.08 birds per km<sup>2</sup> (Zheng Guangmei and Wang Qishan 1998), and the total population in (the limited areas of suitable habitat in) Wuyanling Nature Reserve was estimated at c.50 individuals in 1985–1986 and 50–100 individuals in the late 1990s (Zhang Zhengwang *in litt.* 1997). Zheng Guangmei and Wang Qishan (1998) considered that the density of this species outside nature reserves must be far lower than at Wuyanling. In Guangxi, Wu Mingchuan (1993) estimated the density of this species to be c.2 birds per km<sup>2</sup> at Xiling, and the total population there to be c.40, and in Fuchuan county he found a density of c.3 birds per km<sup>2</sup> at three localities, Haiyangshan Nature Reserve, Yangxi Shan and Laoxi Shan, and estimated the total population at 50–60 individuals.

**ECOLOGY Habitat** Cabot’s Tragopan inhabits subtropical forest in the mountains of south-east China, typically evergreen broadleaf forest and mixed deciduous-coniferous forests between 600 and 1,800 m (Zheng Guangmei *et al.* 1985, Young *et al.* 1991, McGowan and Garson 1995, Lewthwaite 1996, Zheng Guangmei and Wang Qishan 1998), and (presumably only on the highest peaks) open areas above the treeline (Caldwell and Caldwell 1931). Its habitat requirements are similar to those of other tragopans, but it occurs at relatively low altitudes (Zheng Guangmei *et al.* 1985), although it is often found together with Temminck’s

Tragopan *T. temminckii* in the forests of north-east Guangxi (but with no evidence of hybridisation) (Cheng Tso-hsin and Wu Mingchuan 1979). In Guangxi it was found at 700–1,100 m in mixed forest with heavy undergrowth of bushes, dwarf bamboos and ferns (Cheng Tso-hsin and Wu Mingchuan 1979), and in northern Guangdong it was found at 700–1,000 m (Mell 1922). Zheng Guangmei *et al.* (1985) reported that at Wuyanling in Zhejiang it bred at 1,200–1,400 m and descended to 800–1,000 m in winter, but subsequent radiotelemetry studies there showed no obvious vertical movements in winter (Zheng Guangmei *et al.* 1990). At Wuyanling, the core area of semi-natural evergreen deciduous-coniferous forest is surrounded by an area of commercial forestry plantations, and in winter this species was found only in the semi-natural forest, not in the plantations (Young *et al.* 1991). However, during the breeding season many nests were found in *Pinus taiwanensis* trees in the plantations, usually very close to areas of semi-natural forest (Ding Changqing and Zheng Guangmei 1993). The birds probably use these coniferous trees in the plantations because the semi-natural forests at this site have regenerated since the 1950s, and the broadleaf trees are probably not yet mature enough to be used for nesting (Zhang Zhengwang and Zheng Guangmei 1990). At Lishui Forestry Station in Zhejiang this species was found breeding in cedar forest at 930 m (Zhuge Yang and Ding Ping 1988), and at Jinggang Shan Nature Reserve in Jiangxi it was recorded in broadleaf forest at 1,000–1,400 m (Yan Li 1984).

**Food** This species is omnivorous, and feeds on the forest floor on ferns, roots of herbaceous plants, stems, leaves, buds, flowers, seeds and fruits, or on leaves and fruits in trees, occasionally taking some small animals (Zheng Guangmei *et al.* 1986, Zhang Zhengwang *et al.* 1988). At Wuyanling, its distribution appears to be closely associated with that of the tree *Daphniphyllum macropodum*, which it often uses for overnight roosting; it shows a strong preference for the leaves of this tree in winter and early spring, and its leaves and fruits are their most favoured food in autumn (Sun Yuehua and Zheng Guangmei 1991, Sun Yuehua 1995, Zheng Guangmei and Wang Qishan 1998).

**Breeding** The breeding season of Cabot's Tragopan is from March to June, and it is notable for the spectacular frontal courtship display of the male birds (Zheng Guangmei *et al.* 1989, Zheng Guangmei and Wang Qishan 1998). It nests in trees (although it has also been reported to nest on the ground, e.g. by Caldwell and Caldwell 1931), with a simple bowl-shaped nest built at the pits of large trunks or at the base of horizontal branches; clutch size is 2–6 eggs, average 3.5, and the female incubates them for c.28 days (Zhang Junping and Zheng Guangmei 1990). After hatching the young stay in the nest for three days and do not feed (nor does the female leave the nest to look for food); then the female flies to the ground followed by the chicks, caring for the young in her feeding territory of c.3 ha, and remaining with them for the whole winter (Zheng Guangmei *et al.* 1985, Zheng Guangmei 1988).

**THREATS** Cabot's Tragopan is one of four threatened bird species that are entirely restricted to the "South-east Chinese Mountains Endemic Bird Area", threats and conservation measures in which are profiled by Stattersfield *et al.* (1998). Further information relevant to its conservation is given in the accounts for the other threatened species that occur in similar habitats in south-east China, White-eared Night-heron *Gorsachius magnificus*, White-necklaced Partridge *Arborophila gingica*, Elliot's Pheasant *Syrnaticus ellioti* and Brown-chested Jungle-flycatcher *Rhinomyias brunneata*.

**Habitat loss** The main threat to this species is habitat loss and modification. Its range in south-east China is in one of the most densely populated regions in the world, and most of the natural forest has been cleared or modified as a result of the demands for agricultural land and timber; rapid forest loss has taken place in most provinces in south-east China in the past 50 years, for example in Fujian, where timber reserves declined by 50% between 1949 and 1980 (Smil 1984; see Table 1). The progressive replacement of natural evergreen broadleaf forests with conifer plantations is now the main cause of the deterioration and

**Table 1. Changes in the extent of natural habitats within this species's range in south-east China.** The data in this table are reproduced from MacKinnon *et al.* (1996), and show the estimated areas (both original and remaining in km<sup>2</sup>) of presumably suitable habitats within this species's known range in south-east China, and the area of each habitat estimated within existing protected areas. However, it is important to note that this only gives an indication of the extent of reduction (or increase) of presumed habitats, as there is no information on the time-scale over which they have been lost, and this species does not necessarily occur throughout each habitat in this region of China. It is also important to note that the increase in subtropical conifer cover represents plantations, much of which is unlikely to be suitable for the species.

Habitat	Original	Remaining	%	Protected	%
deciduous/evergreen broadleaf forest	229,575	22,838	10	8,151	3.6
subtropical coniferous forest	93,137	165,323	178	16,581	17.8
subtropical evergreen broadleaf forest	682,066	45,298	7	19,839	2.9
tropical limestone forest	16,300	1,630	10	0	0
tropical semi-evergreen forest	69,698	3,707	5	240	0.3

even destruction of its habitats (Zhang Junping and Zheng Guangmei 1990, Zheng Guangmei and Wang Qishan 1998), and suitable forest habitat is also being lost and fragmented through timber harvesting and land conversion for agriculture (McGowan and Garson 1995). At Wuyanling in Zhejiang, there were large areas of undisturbed evergreen broadleaf forest before 1950, but in 1958, during the “great steel making” movement in China, large areas of this forest were logged (Sun Yuehua 1995). Ecological studies there in the late 1980s found a very high rate of nest failure (13 of the 15 nests found failed), mainly because of predation, but also because of bad weather and egg-collection by local people, and this may have been related to the poor quality of the nesting habitat (Zhang Zhengwang and Zheng Guangmei 1990).

**Hunting** Illegal hunting of Cabot's Tragopan for food is still a problem in some places, especially outside protected areas (Zhang Zhengwang in McGowan and Garson 1995). Eggs are collected by local people in some areas, for example at Wuyanling (Zhang Zhengwang and Zheng Guangmei 1990). The wild bird trade may also be a problem for this species, as female birds were seen for sale at markets in Hong Kong in 1992 (SC).

**Predation** Predators such as yellow-throated marten *Charronia flavigula*, leopard cat *Felis bengalensis* and Eurasian Jay *Garrulus glandarius* prey on female birds and/or eggs and young, and predation was the main cause of the failure of 13 of the 15 nests found at Wuyanling in the late 1980s (Zhang Zhengwang and Zheng Guangmei 1990).

**MEASURES TAKEN Legislation** Cabot's Tragopan is a Nationally Protected Species (First Class) in China (McGowan and Garson 1995, Zheng Guangmei and Wang Qishan 1998). It is listed on Appendix I of CITES.

**Protected areas** Cabot's Tragopan has been reported from the following protected areas: Gutian Shan Nature Reserve in Zhejiang (14 km<sup>2</sup>, forest apparently in quite good condition), Jiulong Shan Nature Reserve in Zhejiang (20 km<sup>2</sup>, forest apparently in rather scrappy condition with some coniferous trees on the higher slopes), Fengyang Shan National Nature Reserve in Zhejiang (247 km<sup>2</sup>, forest apparently in fine condition), Wuyanling Nature Reserve in Zhejiang (190 km<sup>2</sup>, forest apparently in moderately good condition), Wuyi Shan Nature Reserve in Fujian (565 km<sup>2</sup>, forest apparently in very good condition), Wanmulin Nature Reserve in Fujian (2 km<sup>2</sup>, forest apparently in quite good condition, but very small and surrounding forest damaged), Guanshan Nature Reserve in Jiangxi (22 km<sup>2</sup>, forests apparently in good condition), Wuyi Shan Nature Reserve in Jiangxi (53 km<sup>2</sup>, forests apparently in very good condition), Jinggang Shan Nature Reserve in Jiangxi (155 km<sup>2</sup>, forests apparently in fine condition), Jiulian Shan Nature Reserve in Jiangxi (42 km<sup>2</sup>, forests apparently in fine condition), Huping Shan Nature Reserve in Hunan (430 km<sup>2</sup>, forests apparently rather damaged but parts appear in fine condition), Tianmen Shan Nature Reserve in Hunan (12 km<sup>2</sup>, forests tiny), Huangsang Nature Reserve in Hunan (254 km<sup>2</sup>, forests apparently in fine condition), Xinhuang Shan Nature



Reserve in Hunan (no information), Ziyun-Wanfeng Shan Nature Reserve in Hunan (107 km<sup>2</sup>, forests apparently in fine condition), Taoyuandong Nature Reserve in Hunan (100 km<sup>2</sup>, forests apparently rather degraded), Qianjiadong Nature Reserve in Hunan (54 km<sup>2</sup>, forests apparently rather damaged in some parts but with some remaining good areas), Mangshan Nature Reserve in Hunan (200 km<sup>2</sup>, forest apparently in good condition), Mao'ershan Nature Reserve in Guangxi (451 km<sup>2</sup>, forest apparently in quite good condition and covering c.68%), Sansuo Nature Reserve in Guangxi (50 km<sup>2</sup>, forest apparently badly damaged), Shoucheng Nature Reserve in Guangxi (759 km<sup>2</sup>, forest apparently badly damaged), Haiyangshan Nature Reserve in Guangxi (904 km<sup>2</sup>, forest apparently badly damaged), Xilingshan Shuiyuanlin Nature Reserve in Guangxi (193 km<sup>2</sup>, forest covering 71% but upper slopes bare), Yindian Shan Nature Reserve in Guangxi (480 km<sup>2</sup>, forest apparently in quite good condition and covering 76%), Huashuichong Nature Reserve in Guangxi (105 km<sup>2</sup>, forest covering 80% but southern slopes badly damaged), Dayao Shan Nature Reserve in Guangxi (2,022 km<sup>2</sup>, forest apparently in moderately good condition, covering c.58%), Pingjiashan Nature Reserve in Guangdong (no information), Chengjia Nature Reserve in Guangdong (no information), Babaoshan Nature Reserve in Guangdong (no information), Yuebei Chinese Tiger Nature Reserve in Guangdong (no information), Chebaling National Nature Reserve (76 km<sup>2</sup>, apparently including some very good areas of primary and mature secondary forest, and with significant areas of important forest outside the reserve boundaries) and Yunji Shan Nature Reserve in Guangdong (no information) (sizes and condition from MacKinnon *et al.* 1996).

The recent rapid increase in the numbers of protected areas within its range has undoubtedly already benefited this species. For example, at Wuyanling the logging of mature forest was stopped when it was established as a nature reserve in 1975, and in 1987 many of the cleared areas in the forest within the reserve were replanted (Sun Yuehua 1995). At Jinggang Shan in Jiangxi, 70–75 birds were hunted annually before the establishment of the nature reserve in 1982, but since then the illegal hunting has stopped (Yan Li 1984).

**Captive breeding** In the early 1990s there were estimated to be c.250 Cabot's Tragopans in captivity worldwide (McGowan and Garson 1995). Captive breeding has been successful at Beijing Normal University, where F3 generation have been reared and more than 20 birds are now kept, and Guilin Zoo in Guangxi (Zhang Zhengwang *in litt.* 1997). It is, however, by no means clear that captive breeding is needed, since this must have the goal of re-introduction (for which see IUCN/SSC 1998), and for this to happen there must be suitable habitat. The most important activity must therefore remain habitat conservation.

**MEASURES PROPOSED** **Protected areas** Although Cabot's Tragopan occurs in many protected areas, its status in most of them is poorly understood and a review of areas of suitable habitat is required throughout its range, to determine which are the key sites for its conservation, whether there is a need to upgrade the status of any reserves or to extend their boundaries to include additional areas of forest, whether measures are necessary at some sites to rehabilitate and restore suitable habitat, and whether some new protected areas need to be established (McGowan and Garson 1995, P. J. K. McGowan *in litt.* 1999).

MacKinnon *et al.* (1996) made the following recommendations for the protected areas where this species has been recorded: at Gutian Shan Nature Reserve, enlarge to c.25 km<sup>2</sup>; at Jiulong Shan Nature Reserve, enlarge to c.30 km<sup>2</sup>; at Fengyang Shan National Nature Reserve, strengthen protection; at Wuyanling Nature Reserve, strengthen protection; at Wuyi Shan Nature Reserve, enlarge reserve and link over the border with the Jiangxi (Wuyishan) reserve; at Wanmulin Nature Reserve, consider extension if forest regeneration and protection feasible; at Guanshan Nature Reserve, enlarge reserve; at Wuyi Shan Nature Reserve, enlarge to 100 km<sup>2</sup> and link with larger Wuyi Shan reserve in Fujian; at Jinggang Shan Nature Reserve, link up with Taoyuan Dong in Hunan and Suichuan Chuizhou further south to form part of Nanshan Tiger Conservation Unit, and revegetate where necessary; at Jiulian Shan Nature

Reserve, link up with Jiulian Shan and Chebaling reserves in Guangdong to form part of Nanshan Tiger Conservation Unit; at Huping Shan Nature Reserve, strengthen protection of better areas and link them with revegetation or encouragement of habitat regeneration; at Huangsang Nature Reserve, strengthen protection; at Ziyun-Wanfeng Shan Nature Reserve, extend and join with Wugangyun Shan and Chengbu reserves if possible; at Taoyuandong Nature Reserve, extend to link up with Jingang Shan in Jiangxi and manage as part of Nanshan Tiger Conservation Unit, and re-green barren hills; at Qianjiadong Nature Reserve, strengthen protection of all areas and extend to join with Qianjiadong reserve in Guangxi; at Mang Shan Nature Reserve, link with Qingxiding and Nanling Shan in Guangdong to form a single (high priority) Nan Shan conservation unit; at Mao'ershan Nature Reserve, join to Qingshan reserve; at Sansuo, Shoucheng and Haiyangshan Nature Reserves, re-evaluate the reserves; at Xilingshan Shuiyuanlin Nature Reserve, manage carefully; at Yindian Shan Nature Reserve, strengthen protection of the best areas; at Huashuichong Nature Reserve, reforestation is needed; at Dayao Shan Nature Reserve, control the planting of star anis *Illicium verum* and illegal logging; and at Chebaling National Nature Reserve, redesign reserve borders to include surrounding good forest, and extend into Hunan and incorporate into Nan Shan Tiger Conservation Unit.

**Habitat management** Published research findings should be used to manage forests appropriately in existing protected areas (McGowan and Garson 1995). The conservation of Cabot's Tragopan depends on the maintenance of their preferred habitat patches inside forests where the species occurs, so that these patches can continue to supply sufficient food and shelter; in degraded areas, habitat management such as replanting with appropriate food and roost tree species must be considered (Young *et al.* 1991). Replanting the tree *Daphniphyllum macropodum*, which is important for both feeding and roosting, may prove to be particularly appropriate.

**Research** As described above (and see Remarks 1), further extensive surveys should be conducted throughout the range of this species, with the objective of reviewing the effectiveness of the existing protected-area system for its conservation (and for the conservation of the other threatened forest birds of south-east China: see above), and determining whether new (or modifications to existing) reserves are required (McGowan and Garson 1995). Its populations should be monitored in selected protected areas (McGowan and Garson 1995). For example, a monitoring centre should be established for this species and its habitat at Wuyanling Nature Reserve, where it has already been studied for more than 10 years (Zhang Zhengwang *in litt.* 1997). Some of these objectives are being addressed from 1999 to 2002, when this species and its conservation will be intensively studied during a project entitled "Studies on the mechanism of ecological adaptations and conservation strategy of the rare and endangered pheasants in China", funded by the National Natural Science Foundation of China (Zhang Zhengwang 1999).

**Captive breeding** The captive population should be managed carefully to minimise loss of genetic diversity, and prevent hybridisation with other *Tragopan* species (McGowan and Garson 1995).

**REMARKS** (1) Many of the published records of this species (and of other galliforms in mainland China) are given by county, and they often do not include the actual localities where birds were found, the type of record (specimens collected, sight records, reports by local people, etc.), the number of individuals recorded or the dates. Such records are very important for the understanding of the overall distribution of a species, but are of limited value for assessing its conservation status and in helping to decide where to target conservation actions. The collection and publication of more detailed information is necessary to improve understanding of the conservation status of this and other Chinese birds. (2) There is an unconfirmed report of this species from southern and eastern Anhui by Lu T. C. (1991), and a record from Tengchong, Yunnan, by He Jichang and Wang Zijiang (1983) is erroneous (Li Xiangtao 1996).