

Short Communication

Ecological extinction of the Critically Endangered northern white-cheeked gibbon *Nomascus leucogenys* in China

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Abstract We conducted an interview survey around and within Mengla and Shangyong Nature Reserves, Mengla County, Yunnan, China, in December 2008 to ascertain whether gibbons were present in the area, and in December 2011 we surveyed two sites in the Reserves for the northern white-cheeked gibbon *Nomascus leucogenys*. We found no signs of the existence of gibbons during the survey. Illegal hunting was common at both sites. Only 36 individuals in nine groups were recorded in Mengla and Shangyong Nature Reserves in the 1980s, and this small and fragmented population was probably unable to survive the pressure of hunting. No white-cheeked gibbon was recorded in Huanglianshan Nature Reserve in a survey carried out by other researchers in 2003. Gibbons have a very low chance of survival in unprotected forest, and we conclude that the white-cheeked gibbon is extinct, or at least ecologically extinct, in China.

Keywords China, conservation, extinction, *Nomascus leucogenys*, northern white-cheeked gibbon, primate

The northern white-cheeked gibbon *Nomascus leucogenys*, which occurs in Vietnam, Lao PDR and China, is categorized as Critically Endangered on the IUCN Red List (IUCN, 2011). In China this species was once widely distributed in Mengla, Jiangcheng and Luchun counties, in south Yunnan, between the Lancang River (Mekong River) and the Yuan River (Red River; Ma & Wang, 1986). Its population was estimated to be > 1,000 in the 1960s (Tan, 1985) but by the 1970s its morning calls could no longer be heard in the county town of Mengla (Gao et al., 1981). In the 1980s the population declined to c. 100 individuals as a result of deforestation and the expansion of rubber plantations, and the species only survived in Mengla County (Tan, 1985; Yang et al., 1985; Fooden et al., 1987; Ma & Wang, 1988). By the late 1980s the population had

declined to 36 individuals in nine groups in Mengla and Shangyong Nature Reserves (Hu et al., 1989; Fig. 1). A field survey in 2003 confirmed that *N. leucogenys* had disappeared from Huanglianshan Nature Reserve, Luchun (Ni & Jiang, 2009).

In December 2008 we interviewed 78 people, mostly nature reserve rangers and former hunters, in 34 villages inside and in the vicinity of Mengla Nature Reserve (113,880 ha) and Shangyong Nature Reserve (33,307 ha), which were thought to hold the last remaining *N. leucogenys* population in China (Yang et al., 1985; Hu et al., 1989). Only three interviewees reported having seen or heard gibbons, at three different places within the Reserves (Zhaokanliang, Leigongyan and Nangongshan; Fig. 1), between 2006 and 2008 (Fan & Huo, 2009).

We conducted a field survey in Zhaokanliang and Leigongyan during 7–23 December 2011. During this time we interviewed five more hunters, all of whom confirmed that they had not seen or heard gibbons in Nangongshan for 20 years, and therefore we did not survey this site.

In Zhaokanliang and Leigongyan an auditory survey technique was employed to assess the occurrence and population size of gibbons (Brockelman & Srikosamatar, 1993). We set three or four listening posts 400–1,300 m apart on mountain ridges at each site to cover all areas that potentially supported gibbons (Table 1). One or two surveyors occupied each listening post from c. 7.00 (before sunrise) to 12.00 for 5 consecutive days. We also recorded signs of human disturbance (grazing, hunting, logging and agriculture) and any large animals.

During the survey we did not hear or see any signs of gibbons. On 11 December we saw a group of 20–30 macaques *Macaca mulatta* and, in Zhaokanliang, some fresh footprints of gaur *Bos gaurus*. No evidence of logging or agriculture was found at either site but local people grazed buffalos in Zhaokanliang. Illegal hunting was common at both sites. We heard 33 gunshots in 5 days and saw five hunters carrying a total of four guns on 11 December in Zhaokanliang. We heard 15 gunshots and saw eight campsites used by hunters in Leigongyan. We saw four hunters with a total of three guns on 23 December in Leigongyan; they had killed one Phayre's leaf monkey *Trachypithecus phayrei*, two silver pheasant *Lophura nycthemera*, one rufous-throated hill partridge *Arborophila*

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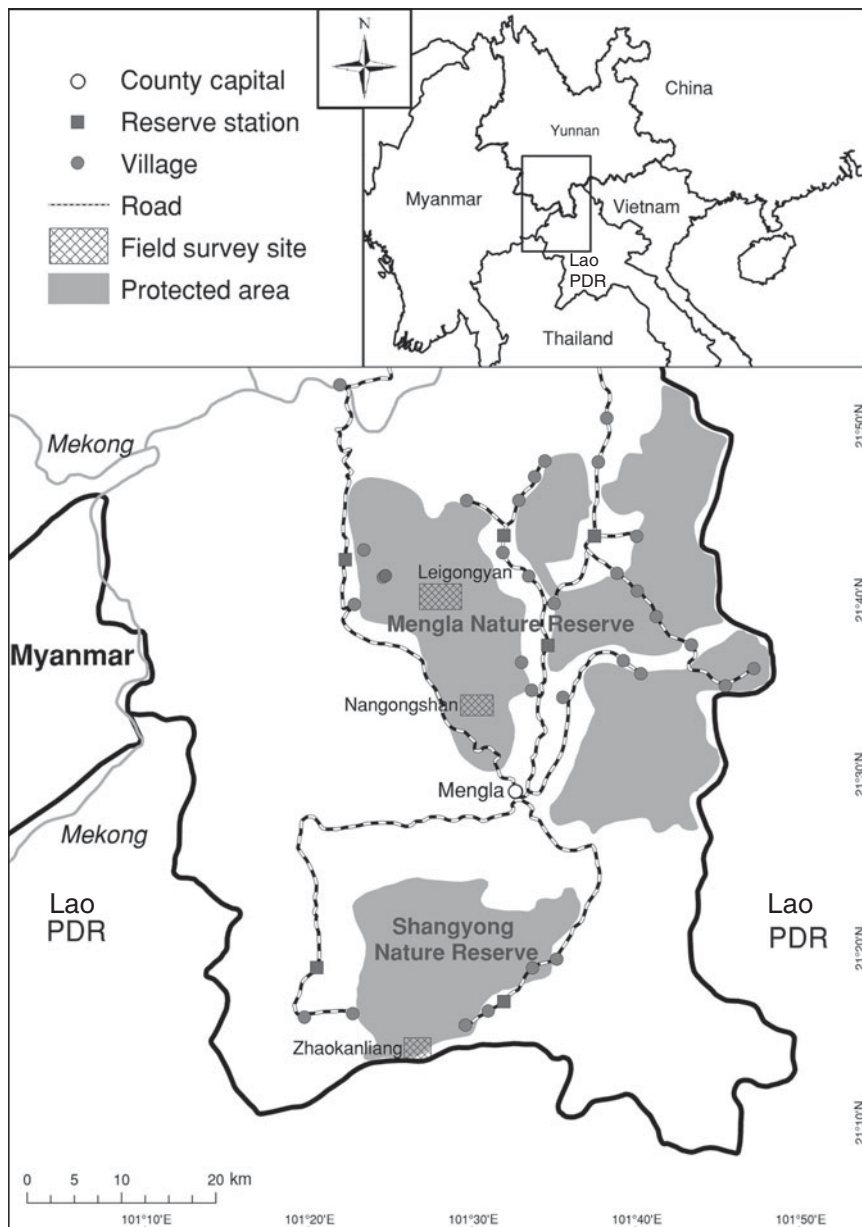


FIG. 1 The Mengla and Shangyong Nature Reserves and surrounding villages, and the two sites where the northern white-cheeked gibbon *Nomascus leucogenys* was surveyed in Mengla County, Yunnan, China.

TABLE 1 Survey site, listening posts and number of survey days for the northern white-cheeked gibbon *Nomascus leucogenys* in Mengla Nature Reserve (Fig. 1) in December 2011.

| Survey site | Camp or listening post (LP) | Latitude (N) | Longitude (E) | Altitude (m) | No. of survey days |
|--------------|-----------------------------|--------------|---------------|--------------|--------------------|
| Zhaokanliang | Camp 1 | 21°14.263' | 101°27.518' | 906 | 5 |
| | LP1 | 21°14.246' | 101°27.009' | 994 | 5 |
| | LP2 | 21°14.195' | 101°26.841' | 1,110 | 5 |
| | LP3 | 21°13.543' | 101°27.135' | 1,248 | 5 |
| Leigongyan | Camp 2 | 21°42.816' | 101°26.316' | 1,170 | 1 |
| | Camp 3 | 21°42.115' | 101°28.064' | 1,371 | 5 |
| | LP 4 | 21°42.126' | 101°28.212' | 1,436 | 5 |
| | LP 5 | 21°42.032' | 101°28.629' | 1,629 | 5 |
| | LP 6 | 21°41.938' | 101°28.787' | 1,690 | 1 |
| | LP 7 | 21°41.867' | 101°28.230' | 1,693 | 4 |

rufogularis, one giant flying squirrel *Petaurista philippensis* and an unidentified mammal.

It is possible that some gibbons still occur in these nature reserves and remained undetected by us, but the possibility is low. Habitat loss, degradation and fragmentation caused by deforestation and the expansion of rubber plantations between the 1960s and the 1980s have been reported as the main causes of the decline in the gibbon population in the area (Tan, 1985; Yang et al., 1985; Fooden et al., 1987; Ma & Wang, 1988). In 1989 there were only 36 gibbons in nine groups, at seven sites isolated by roads and villages, in Shangyong and Mengla Nature Reserves (Hu et al., 1989). The biggest subpopulation comprised eight individuals in two groups and was vulnerable to illegal hunting. We heard gunshots every day during this survey. The Yao and Aini ethnic groups hunt all large mammals in the reserves, including tiger *Panthera tigris*, elephant *Elephas maximus*, and gaur. They also hunt gibbons for food and traditional medicine (Fan & Huo, 2009).

Although tiger, elephant, gaur and gibbon are all Class I Protected Animals in the Chinese Wildlife Conservation Law, illegal hunting of these animals occurs in nature reserves because of low awareness, poverty of local communities and poor management of the reserves. Without effective protection the small subpopulations recorded in the 1980s had little chance of survival under hunting pressure. By 2008 only three sites might still have supported very small populations of gibbons (Fan & Huo, 2009). In Zhaokanliang and Leigongyan only one individual was seen by local people between 2006 and 2008. Even if individuals survived and simply remained undetected during our survey it is unlikely that the species could survive in the long term.

Given the absence of gibbons inside Mengla and Shangyong Nature Reserves and in Huanglianshan National Nature Reserve (Ni & Jiang, 2009) their chance of survival in unprotected forest is low. No gibbons have survived outside nature reserves in south-east Yunnan in recent years except for a population of four individuals in Bajiaohe, reported in 2009 (Ni & Jiang, 2009). In Bajiaohe killing a gibbon is considered a bad omen by local people. We conclude that *N. leucogenys* is extinct, or at least ecologically extinct, in China.

China once supported one of the world's richest gibbon faunas, with three genera and six species (*Hylobates lar*, *Nomascus concolor*, *Nomascus nasutus*, *Nomascus hainanus*, *N. leucogenys*, and *Hoolock leuconedys*; Geissmann, 2007), second only to Indonesia (Grueter et al., 2009). However, *H. lar* and *N. leucogenys* now appear to be extinct from China (Grueter et al., 2009; present study), and small population size, habitat fragmentation and illegal hunting put all of China's remaining gibbon populations on the edge of extinction (Jiang et al., 2006; Fan et al., 2011). The small population of Hainan gibbons has been recovering

following strict enforcement of anti-poaching measures in 2003 (Fellowes et al., 2008). Conservation activities aimed at saving the remaining gibbon populations include education to raise the awareness of the public and government, sustainable development of local communities, improved management of reserves, and monitoring and research to safeguard existing groups (Chan et al., 2005; Fellowes et al., 2008).

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Biographical sketches

PENG-FEI FAN has been studying the behavioural ecology and conservation biology of gibbons in China for 10 years. He has studied *Nomascus concolor* in the Wuliang Mountains, *N. nasutus* in Bangliang and *H. leuconedys* in Gaoligongshan. He has also surveyed *N. leucogenys* in Xishuangbanna, *N. hainanus* in Bawangling and *H. lar* in Nangunhe Nature Reserve. HAN-LAN FEI studied *N. nasutus* in Bangliang for 1 year and is now studying *H. leuconedys* in Gaoligongshan. AI-DONG LUO is a wildlife conservationist working in Xishuangbanna Nature Reserve.