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Leopard cat

Prionailurus bengalensis



Fig. 1. During a photo trapping session in several giant panda reserves, the leopard cat was the most prevalent species. From top to bottom: Wanglang National Nature Reserve in May 2005, Xuebaoding National Nature Reserve in April 2007, Shengguozhuang Nature Reserve in August 2008 (Photos Peking University, Smithsonian National Zoo Park, World Wildlife Fund and Shanshui).

The leopard cat *Prionailurus bengalensis* is approximately the size of a domestic cat, but with longer legs. The tail is about 40–50% of the length of head and body. The ground colour can be a pale to a reddish or greyish yellow. Individuals from the north are pale silver grey, whereas those from the south are yellow, ochre or brownish. Especially northern individuals have black or rusty brown spots and blotches varying in size and covering their entire body (Fig. 1). The spots can form stripes on the neck and back. The underbelly and neck are white. The tail is spotted, with a few indistinct rings near the black tip (Yu & Wozencraft 1991, Sunquist & Sunquist 2002). Spot patterns vary greatly from one individual to the next.

Status and distribution

The leopard cat has the broadest geographic distribution of all small Asian cats. It is found in much of Southeast Asia. Range countries include: Afghanistan, northern Pakistan (Yu & Wozencraft 1991), India (e.g. in the Arunachal Pradesh; Mishra et al. 2006), Nepal, China (Lu & Sheng 1986b, Yu & Wozencraft 1991), Korea (Nowell & Jackson 1996), Russia (e.g. in the Amur basin; Yu & Wozencraft 1991), Bhutan, Myanmar, Bangladesh, Laos, Cambodia, Vietnam, Thailand (Sunquist & Sunquist 2002), Malaysia (e.g. in the Jerangau Forest Reserve; Azlan & Sharma 2006), Singapore, Brunei Darussalam, Indonesia (IUCN 2010), Japan (Irimote and Tsushima islands; IUCN 2010), Taiwan, and the Philippines (Yu & Wozencraft 1991).

The leopard cat seems to be common across much of its range, e.g. China and Thailand (Sunquist & Suquist 2002). Leopard cat populations are stable in many areas and the species' high adaptability enables it to thrive even in altered habitats such as palm oil plantations (IUCN 2010). However, according to the IUCN Red List (2010), the species seems to be in decline in some parts of its range. Island populations are most vulnerable, but it is also said to be declining in Bangladesh, and vulnerable in India. Nowell & Jackson (1996) expressed concern about the species' status in the Russian Far East where the population is small and restricted to the Amur Region.

The leopard cat is widely distributed over China (Fig. 2) and exists probably in relatively large numbers compared to other felid species. With the exception of the deserts in the west, dry wilderness areas, and central parts of the Qinghai-Tibet Plateau, it is distributed all over the country (Lu & Sheng 1986b, Smith

& Xie 2008). In the 1990s leopard cats have even been reported from the outskirts of Beijing, where they were thought to have disappeared years ago (Nowell & Jackson 1996). However, only very few studies have really looked into the present status of the leopard cat. According to two studies in Yunnan in 2005 and in 2006-2007, leopard cats are thought to be common in both the Nangunhe National Nature Reserve and the Xishuangbanna region (L. Feng, pers. comm.). Smith & Xie (2008) distinguished 4 subspecies in China: *P. b. alleni* on Hainan Island; *P. b. bengalensis* in southwestern Guangxi, southwestern Guizhou, Sichuan, southern Tibet, and central, western and southern Yunnan; *P. b. euphilurus* in northern Anhui, Beijing, Hebei, Heilongjiang, Henan, northern Jiangsu, Jilin, Liaoning, Nei Mongol, Shandong, and Shanxi; and *P. b. chinensis* in the rest of the species' range in China. Wang et al. (1996) argued that *P. b. scripta*, found in northern Yunnan, western Sichuan, southeastern Qinghai, southern Shanxi and Gansu, Ningxia, Shaanxi, north-western Guizhou, and eastern Tibet, should be a valid subspecies. However, this remains controversial (Smith & Xie 2008). More recent evidence even suggests that *P. b. euphilurus* is not a valid subspecies as it is too similar to *P. b. bengalensis* (IUCN 2010).

The two subspecies *P. b. bengalensis* and *P. b. chinensis* were estimated to number 1.5–2 million in China in the 1990s (Anonymous 1996a). Even though hundreds of thousands were trapped for the fur trade in the 1980s (Sunquist & Sunquist 2002), leopard cats still seem to be fairly common. But a decline in harvest in the last years of legal trapping may be an indication for over-hunting (Wang 1998). Reasons for the leopard cat's relative abundance in China compared to other cat species may include its use of a wide range of habitats, better adaptation to human settlements, and fewer large predators it has to compete with, since those are overhunted or exterminated in certain areas (Lu & Sheng 1986b).

Habitat

In China, the leopard cat's habitat varies widely. It occupies temperate, subtropical and tropical habitats, including primary and secondary forests, hill forests, shrubs and grasslands, but it is thought to prefer secondary forests, and forest fringes. It is less common in the arid areas of the north and north-west, as well as high mountain shrubland and highland grass habitat. It also lives in man-

Prionailurus bengalensis

Fact Sheet

Names:

豹貓 [bao mao]
leopard cat

Head and body length:

36-66 cm

Tail length:

20-37 cm

Weight:

1.5-5 kg

Global Population:

unknown

Chinese Population:

unknown

Distribution in China:

everywhere but W China

IUCN Red List:

Least Concern (2008)

CITES:

Appendix II

China Red List:

VU A1acd

China Key List:

not listed



Photo A. Sitwa

made economic forests (e.g. rubber and tea plantations and pine forests etc.) and agricultural landscapes, and is often seen near villages (Lu & Sheng 1986b, Yu & Wozencraft 1991, Wang et al. 1996, Sunquist & Sunquist 2002, L. Feng pers. comm.).

Ecology and behaviour

Leopard cats are often described as nocturnal, but they can be active during the day, and peak activity varies individually. They are known to be solitary, but can also be found in pairs (Fig. 3), mostly during their mating season. Leopard cats are good climbers; Rabinowitz (1990) described them as arboreal to some extent, but resting sites are in most cases on the ground in dense cover. In the wild, birth dens have been found in hollow trees, among bushes, under overhanging rocks in small caves, under big roots, and between rocks. They are excellent swimmers, and show an affinity towards water (Yu & Wozencraft 1991, Nowell & Jackson 1996). There is no information about home range size in China, but studies made in Thailand showed home ranges of 4.1 km² for males and 2.5 km² for females in seasonal evergreen forest in south-central Thailand (Grassman 2000) and 12.4 and 14 km² for males and females respectively in north-central Thailand (Grassman et al. 2005). In the Khao Yai National Park home ranges measured

5.6 km² for males and 4.3 km² for females from March 1998 to October 1999. Austin et al. (2007) found that leopard cats used larger areas during the wet season compared to the dry season. In a study at the end of the 1980s on Iriomote Island, male leopard cats had an average home range of 2.96 km² and females of 1.75 km² (Sunquist & Sunquist 2002).

Leopard cats in the northern part of their range usually bear their young in May, but they can breed all year around in the tropical southern regions (e.g. Java). In captivity they may breed twice a year, but in the wild they probably breed only once (Lu & Sheng 1986b, Sunquist & Sunquist 2002). The litter size is 1–4, usually 2–3 kittens. Age of sexual maturity is as early as 8 months to a year in some records (Nowell & Jackson 1996), in others at 18–24 months (Yu & Wozencraft 1991). They can live up to 15 years in captivity (Nowell & Jackson 1996). Leopard cats have been known to hybridize with domestic cats and produce fertile, viable offspring (Sunquist & Sunquist 2002).

Prey

Small mammals, mainly rats, mice, shrews, moles and hares have been recorded as the prey of leopard cats in China, Russia, the Philippines, Java, Bangladesh, Japan, and Thailand (Nowell & Jackson 1996, Grassman 2000, Sunquist & Sunquist 2002, Grassman

et al. 2005, Austin et al. 2007). Khan (2004a) found in a study in Bangladesh mice and rats in 52.4% of 21 leopard cat scats. The cat's diet also includes primates such as langurs, other mammals such as ground and flying squirrels (Pakistan; Roberts 1977), bats, and flying foxes, as well as birds such as swallows, fowl

and other game birds (Pakistan; Roberts 1977), and possibly young ungulates such as roe deer (Heptner & Sludskii 1992) and mouse deer (India). Reptiles such as lizards and skinks, amphibians, insects, eels and other fish, crabs and occasionally carrion and herbs are also taken (Sunquist & Sunquist 2002, Smith & Xie

2008). Watanabe et al. (2003) identified 46 prey species in 156 scats on Iriomote Island. Leopard cats are also known to kill poultry and domestic fowl (Yu & Wozencraft 1991, Sunquist & Sunquist 2002).

In captivity

It is likely that a large but unknown number of leopard cats live in captivity in Asian and European zoos. They are regularly found in zoos, and in the pet and fur trade, but the species is not well represented in ISIS zoo collections (Sunquist & Sunquist 2002). Chinese zoos have no interest in small cats and as such only a few zoos keep or have kept leopard cats in China. The leopard cat is widely used to crossbreed with domestic cats resulting in hybrids for the pet trade.

Main threats

In China, commercial exploitation has been heavy for the last several decades, especially in the southwest (Nowell & Jackson 1996, IUCN 2010). The earliest available harvest numbers are from 1952 and add up to around 14,000 skins from the provinces of Jiangxi, Hunan, Hubei, Henan, Guizhou, Guangxi, and Yunnan. By 1981 this number had risen to 38,000 skins for the same provinces (Johnson & Yu 1996). From the mid to the end of the 1980s over 10,000 furs were harvested annually from each of Yunnan, Guangxi, Hubei, Hunan, Jiangxi, Guizhou, and Sichuan Provinces, estimated at a total of up to 400,000 skins per year, of which 100,000 to 200,000 were exported annually. In 1985-1988 very high estimates sometimes exceeded 400,000 skins and at least half of these skins came from Yunnan and Guizhou Province alone. Many of these skins were exported to Europe until their import was banned in 1988, due to concerns over the species' status. Skins were also exported to Japan (50,000 skins in 1989), as well as surrounding regions (e.g. Nepal, Kashmir). Most of the trade was done through Chinese companies specialized in trade and probably all of the traded animals are from the wild (Yu & Wozencraft 1991).

While export numbers were still high in 1988 (nearly 200,000 skins), they started to decline from less than 100,000 skins in 1989 to 8,000 in 1992 until export was suspended in 1993 (Johnson & Yu 1996).

Major threats for this species in China in the past were over-harvesting and habitat loss with the strong deforestation during the rapid expansion of the human population (Yu & Wozencraft 1991, Johnson & Yu 1996, Nowell

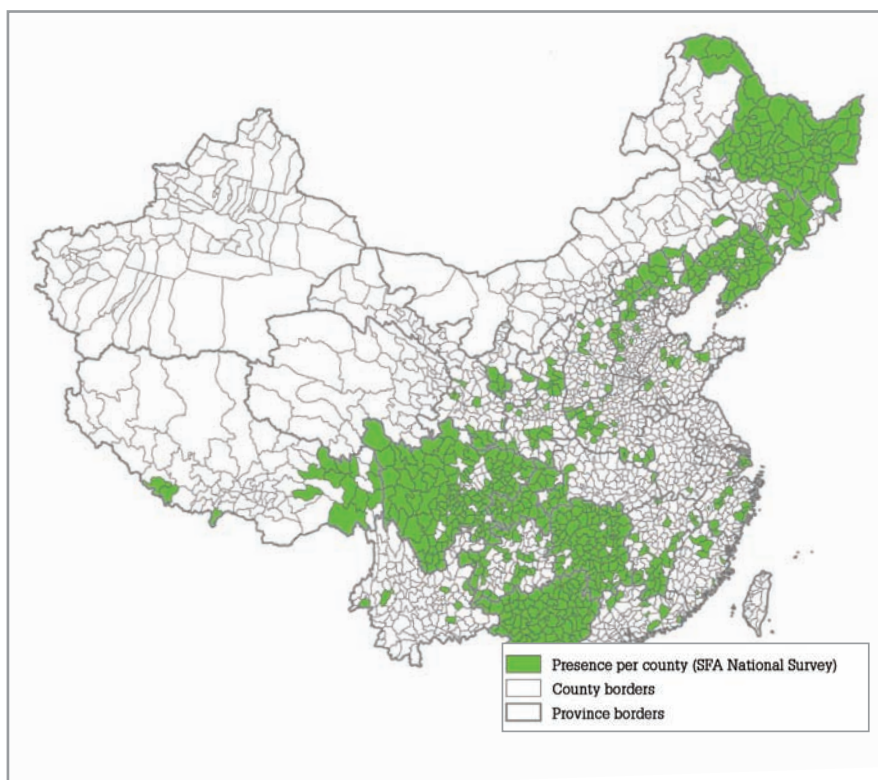
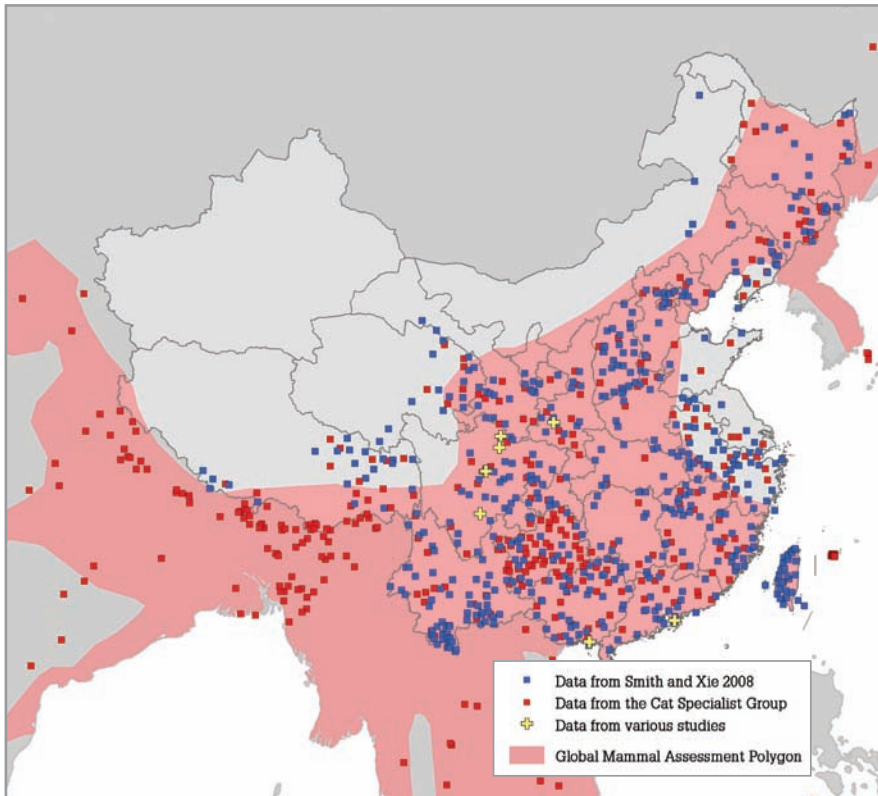


Fig. 2. Distribution of the leopard cat in China.

& Jackson 1996, Wang et al. 1996, Sunquist & Sunquist 2002, Shepherd & Nijman 2008). Nowadays, the extent of direct persecution in form of illegal harvest and of indirect persecution through secondary poisoning of rodents is however not known. The leopard cat may profit from the rural exodus, the reforestation and the decrease in commercial harvest (see below), but there is no study available on the long-term population trends.

Outside China, small and isolated island populations are seriously threatened in the Philippines and Japan (Johnson & Yu 1996, Nowell & Jackson 1996). Broad scale habitat modification and forest clearance for agriculture and plantations are major threats across the species' range, as these habitats then lack the understory necessary for the cats' prey to survive (Sunquist & Sunquist 2002). While the leopard cat appears to be more tolerant of these disturbed areas of deforestation and habitat alteration (where it is still encountered in higher numbers, compared to other small Asian felids), it probably also undergoes higher mortality in such areas (Nowell & Jackson 1996, IUCN 2010). Leopard cats are widely viewed as poultry pests and retributational killing occurs (IUCN 2010). They are apparently eaten as a delicacy in parts of their range, and also captured alive and sold as pets, e.g. in Sumatra. Another problem is hybridization with feral domestic cats, which was observed in the wild. In North America and Europe, domestic cat breeders artificially cross pure leopard cats with a variety of domestic cats to produce hybrids sold as "bengal cat" or "safari cat". (Nishimura et al. 1999, Sunquist & Sunquist 2002, IUCN 2010).

Current and future protection

An international call in 1992 discouraged leopard cat fur import from China until the following conservation recommendations were implemented. These recommendations included: (1) adequate protection should be provided by provincial or national legislation, clarifying the legal status, controlling wild harvests and exports and enforcing quotas, as well as regulating international trade; (2) all inventory stockpiles should be labelled with the company name and numbers of skins as they are inventoried (not as they enter trade); (3) where trade is illegal, prohibitions should be enforced by provincial Forestry Bureaus; (4) in-depth studies of the relationship between the number of animals harvested and harvest effort (mostly in Guizhou and Yunnan)



Fig. 3. On rare occasions one can also find several individuals in a group. This is a mother and her young with another adult individual. The photo was taken in Wanglang National Nature Reserve in August 2004 in Sichuan (Photo PKU, NZP, WWF & Shanshui).

should be conducted; and finally (5) a viable management program for leopard cats should include enforceable harvest quotas in the provinces and field studies to gather ecological data (CITES 1992, Johnson & Yu 1996). Chinese export of leopard cat skins was suspended in April 1993. At that time, the Chinese authorities declared a stockpile of roughly 800,000 skins and said that there had been no legal taking of skins since 1989. China's CITES Management Authority stated that no export of skins or products not already held in stock was permitted until a previously announced field survey had been completed and a succeeding management program established (Yu & Wozencraft 1991, Anonymous 1992, Anonymous 1996b, Nowell & Jackson 1996). Because the systematic field survey had not been completed, after the old stockpile from the 1990s had been gradually exported to exhaustion, no export permits were issued in subsequent years. There may be limited consumption in China's domestic market, but the number should be low (perhaps a thousand or so yearly). This may indicate that the hunting pressure on the Chinese leopard cat populations has been dramatically reduced in recent years. China's massive natural forest protection campaign since 1998 may also be tremendously helpful for habitat recovery, which should be beneficial for the leopard cat. Nevertheless, until comprehensive status and trade surveys sup-

ported by population ecology studies of the leopard cat have been carried out, the status of leopard cat populations remain unclear. Such surveys should be encouraged in the future as the results will be valuable for effective conservation and possibly sustainable use of the species (Anonymous 1992).

In India, Bangladesh and Thailand the cat is on Appendix I, which bans international trade (Anonymous 1996b, IUCN 2010). The species is protected at the national level over part of its range, with hunting prohibited in Bangladesh, Cambodia, Hong Kong, India, Indonesia, Japan, Malaysia (except Sabah), Myanmar, Nepal, Pakistan, Philippines, Russia, Thailand and Taiwan, and with hunting and trade regulations in place in South Korea, Laos and Singapore (Nowell & Jackson 1996). In China the leopard cat is not listed as a national key protected species, and therefore there is no legal protection outside protected areas. As a consequence of the lack of protected status, the leopard cat was not included in the State Forestry Administration's countrywide survey (State Forestry Administration 2009). To include the species in future surveys would be a first step towards a continuous monitoring of the leopard cat populations.

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