

TAMING THE TIGER TRADE

CHINA'S MARKETS FOR WILD AND CAPTIVE TIGER PRODUCTS SINCE THE 1993 DOMESTIC TRADE BAN

KRISTIN NOWELL AND XU LING

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by Kristin Nowell and Xu Ling



Credit: Kristen Conrad

Visitors view Tigers at Harbin Tiger park, China 1999

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EXECUTIVE SUMMARY

Tigers are threatened with extinction, with a global effective population size of fewer than 2,500 adults in the wild. One of the primary threats to their survival is illegal trade in bone, used for traditional medicines or for health tonics. The illegal trade in skins for clothing is a growing threat, as well. With Tigers so rare, demand has widened to other Asian big cat species, including Leopard, Snow Leopard and Clouded Leopard. China's consumers have held the largest market share of these global, illegal trades.

China's existing policy—a complete trade ban, implemented in 1993—has been vital to protecting Tigers in the wild. China's government should be congratulated for the positive, long-standing impacts of its policy, its enforcement actions and awareness efforts in support of Tiger conservation. This is particularly the case with traditional medicines. The TRAFFIC surveys of the current report found little Tiger bone available in China, with less than 3% of 663 medicine shops and dealers in 26 Chinese cities claiming to stock it. There was high awareness that Tiger is protected and that trade is illegal (with 64% of retail pharmacies mentioning this to the TRAFFIC investigators). China's medicinal industry now appears largely in compliance with the 1993 trade ban. The ban has greatly reduced the production, sale and use of Tiger and Leopard medicines. With regard to traditional medicine, China's policy is achieving its goal.

Notwithstanding the effectiveness of China's ban in reducing bone trade, new markets for Tiger and Leopard skins have risen within the past five years, particularly in areas of China that are traditionally Tibetan. About 3% of Tibetans surveyed in major towns, such as Lhasa and Nagchu, claimed to own cloaks, or *chubas*, made from Tiger or Leopard skin, even though most people know this is illegal.

In 2005, China's government and other concerned organizations publicized the environmental concerns—and illegal nature—of this skin trade. TRAFFIC's time-lapse surveys suggest there has been a decline in the sale and use of Tiger skin clothing after these awareness efforts. With strict enforcement as a backdrop, public education can be a powerful tool for raising awareness, changing consumer behaviour and reducing illegal trade.

Since 1999, China has seized more Tiger and Leopard products than any other range State. This shows strong enforcement effort, and considerable enforcement success. However, China's seizure records are also an indication of continuing demand, despite the market declines suggested by TRAFFIC's surveys. China's enforcement efforts must remain strong if illegal trade is to continue declining in future years.

TRAFFIC's findings provide strong evidence that China's trade ban has been effective at reducing the market for Tiger products, particularly traditional medicines. Still, illegal trade remains a threat. China's progress in Tiger conservation, especially Tiger trade, would almost certainly be undone if China's markets for Tiger products were re-opened. Presently, business people in China who stand to profit from Tiger trade are encouraging demand for Tiger products. And the government of China has been petitioned to ease its trade ban by allowing domestic trade in medicines made from captive-bred Tigers.

Lifting the ban or weakening China's policy by exempting products derived from captive-bred Tigers would be dangerous, heightening the possibility that Tigers will some day become extinct in the wild. A trade policy shown to be effective should not be changed unless a convincing science-based argument can be made that a change in policy would enhance Tiger conservation. Examination of the principal arguments for policy change fails to find them convincing. Rather, the evidence indicates that trade bans have helped to protect Tigers in the wild, and that illegal wild Tiger trade would likely persist even if an alternative source of supply (e.g., captive-bred Tigers) were available. The current ban does not harm public health, as there are numerous, approved substitutes to Tiger bone within China's official pharmacopoeia. The discussion of lifting China's trade ban is, in substance, an argument about economic benefit to a small number of wealthy Tiger breeders; the intensive breeding of Tigers in China has little, if any, relation to Tiger conservation, particularly since China's Tiger breeding centres have no feasible plans for Tiger re-introductions.

Moreover, to overturn the ban would call into question the government's many years of excellent effort implementing and enforcing its trade ban, which have ranged from public education campaigns and support for effective substitutes for Tiger medicines to severe punishment for law breakers. China has made a sacrifice, both economic and cultural, in giving up Tiger medicines. But undertaking this sacrifice demonstrates laudable international leadership and responsibility, given how the demands of its market in previous decades brought the Tiger to the verge of extinction both inside China and in neighboring countries.

China's Tiger trade ban fully implements CITES Resolutions, is in harmony with the policies of neighboring and other Tiger range States as well as former consumer countries, and has served as a model for other countries to follow. It has clearly protected wild Tigers and helped reduce illegal trade in Tigers and other Asian big cats. **The Government of China should maintain its domestic trade ban, and reject petitions to weaken this policy.**

Still, illegal trade remains a serious problem. China's enforcement actions have met with success, particularly in established markets. Yet trade is flexible and new markets and trade routes constantly arise. **The Government of China should continue and strengthen law enforcement efforts against the illegal trade in Tigers and other Asian big cats, particularly the skin trade in the western parts of the country.**

Captive Tiger populations are a drain on resources and encourage continued demand for Tiger products. **Intensive Tiger breeding should be stopped, breeding programmes should be integrated with international efforts, and stocks of Tiger carcasses should be destroyed.**

Public education has been effective. This is seen in the clear decline in use of Tigers in traditional medicines over the past 15 years, as well as the apparent decline in the trade in skins in just the past two years. **Public education should take a central role in conservation efforts, and the Government of China should heighten awareness of its ban on trade.**

摘要

野外调查表明,目前全世界野生虎有效种群不足 2500 只,虎正面临灭绝的危险。除了栖息地减少以外,虎生存的主要威胁来自于非法贸易,生产传统医药和保健品需要虎骨,近年来虎皮被用于某些民族服饰的生产,这些需求引起的非法贸易是威胁虎生存的重要因素。随着野生虎的减少,目前非法贸易的压力也已经转移到其他大型亚洲猫科动物身上,如豹、雪豹、云豹。

1993 年,为了保护野生老虎,中国政府全面禁止了虎制品的贸易。中国政府积极的,长期坚持的保护政策,并通过有效的执法行动和全面的老虎保护意识教育来保护野生老虎的精神应该得到推崇.这些行动和措施已经取得了很大的成就。

本次调查表明,中国国内虎骨的非法贸易已不多见,在调查的 26 个城市的 763 家中药店和批发商铺中,仅有 3%的药店和 1%的商铺声称有虎骨供应,就是这些药店,也没有见到实物。值得注意的是,在调查的中药店中,有 64%的销售人员主动告诫调查者,国家禁止虎产品的销售,虎产品贸易是非法行为,显示从业人员有很强的保护意识。这与二十世纪九十年代中期的市场调查相比,1993 年颁布的这一禁贸法规成效很大,大幅减少了虎产品的贸易和消费使用。在中药业中,中国实施的虎骨贸易禁令起到了预期的结果。

但是近五年来,在虎骨贸易大幅下降的同时,却出现了新的非法虎皮贸易市场,尤其是在中国的西藏地区。据调查,在藏区的城镇中,如拉萨、那曲等地约 3%的藏民声称他们拥有虎皮服饰.尽管他们大多数人知道国家禁止虎皮的贸易。

针对这种现象,2005 年,中国政府和其他有关组织开展了环保意识宣传活动,让公众了解野生虎的濒危状况,并宣传国家为了保护老虎而制定了禁止虎皮贸易的法规。根据我们多次市场调查的对比,尽管还有不少商铺在继续出售虎皮装饰的服装,但销售量和用量均有下降。以严格执法作为后盾,通过公众教育,树立保护意识,改变消费行为,可以大大减少虎皮的非法贸易。

自 1999 年以来,在中国境内查获的虎豹产品数量远多于其他虎豹分布国。这在反映中国政府的执法严格和成效的同时,也说明了中国国内仍有很大的虎豹产品需求市场。因此,中国政府应该继续加强执法力度。

调查表明,中国的老虎禁贸法规已有效地遏制了虎产品的消费,尤其是中药业中对虎骨的需求。但目前非法贸易对虎的生存仍是严峻的威胁,如果重开老虎贸易市场,中国为保护老虎而禁止虎产品非法贸易的所有努力将付之东流。最近,部分养虎业者,要求政府放宽贸易禁令,允许圈养虎产品在中医药中使用。这个重开老虎市场的建议是非常危险的,会大大增加野外老虎灭绝的危险。

根据目前国际流行的,被大家所接受的保护预警原则,除非有强有力的、科学的证据证明必须改变一项有效的保护政策法规,否则该政策就不应改变。目前,尚未有科学的论证表明我们可以放宽禁止虎制品贸易。而且,要区别虎制品来源于圈养虎还是野生虎是十分困难的,开放圈养虎贸易同时又要杜绝野生虎的贸易是难于做到的,因此取消禁令或放宽政策只会刺激虎制品的消费从而加快野生虎的灭绝。

另外,虎制品禁贸多年来,在中国各方努力下,已有多种有效的虎骨替代品,虎产品的禁贸令并没有影响到全民的医疗保健。因此,我们有理由继续保持虎产品贸易禁令,以保护野生虎资源。

毋庸置疑,在中国禁止虎产品贸易影响了一个很大的药品行业,无论在经济上还是传统文化上中国已经作出了很大的牺牲。多年来,为了保护老虎,中国政府在实施贸易禁令,有效执法,公众教育,支持在中医药中使用替代品的研究以及判处违法者方面有出色的贡献,所有这些都证明中国是世界上一个负责任的大国,在野生动物保护方面起领导作用,特别是在一个有着悠久的虎制品传统市场的国家中特别的不容易。如果现在放弃这个贸易禁令,那么这些成果就会遭到国际社会的质疑而付之东流。

中国虎产品贸易禁令也充分履行了 CITES 的条约,这一政策是与邻国和其他虎分布国和消费国的保护政策相一致的。很清楚,这一政策有效地保护了野生虎,并遏制了虎及其他亚洲大型猫科动物的非法贸易。中国的虎产品贸易禁令为其他国家树立了典范,成为其他国家仿效的榜样,因此,中国政府应该继续严格禁止虎产品的贸易。

调查表明:目前虎的非法贸易仍是严峻的问题,而且由于非法贸易错综复杂,旧的非法贸易被打下去了,新的市场和贸易链条仍在不断兴起,只要有需求存在,打击非法贸易的行动就一天也不能放松。因此,我们建议中国政府应该继续加强执法力度,打击虎及其他大型猫科动物的非法贸易,尤其应该加大对中国西部地区的非法虎皮贸易的打击。

重开虎制品市场无疑会刺激公众对虎产品的需求,从而刺激虎制品的非法贸易。在目前全球虎种群处于十分脆弱的情况下,我们不能冒这样的风险。而且,目前由于缺乏野外栖息地,圈养虎也难以重引入野外,大规模的圈养老虎对野生虎的保护没有多大的意义。因此我们建议采取措施停止虎的大规模繁育,销毁人工圈养场的老虎尸体库存,以免流入市场。

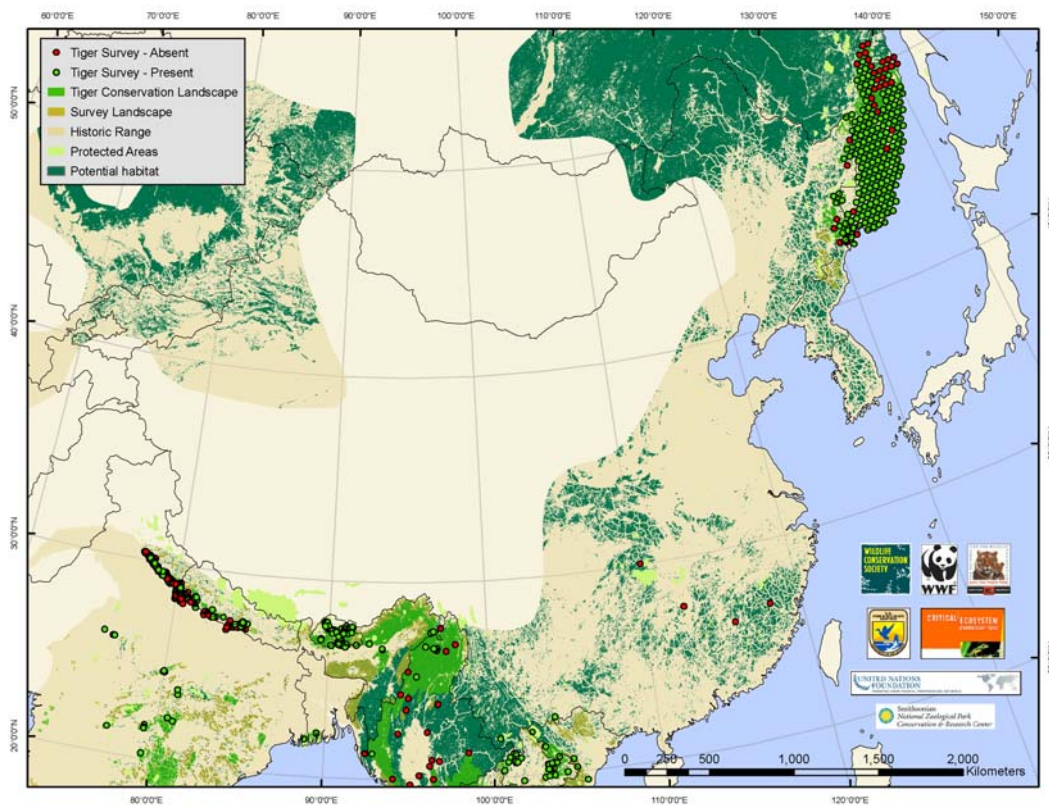
调查证明公众保护意识的教育对老虎的保护十分有效。通过公众教育,中国在过去的 15 年内有效地减少了虎产品在传统医药中的使用。最近两年与非法虎皮贸易的斗争中,通过公众教育也促使虎皮贸易的迅速下降。因此我们建议进一步采取有效措施,加强公众教育,向公众重申禁止虎类制品的贸易,提高公众保护老虎的意识。

INTRODUCTION

In 2004, Animal Planet, an American cable TV channel with international distribution, asked viewers to nominate their species of choice for a contest to determine the world's most popular animal. The response, from 73 countries: the Tiger *Panthera tigris* is number one (Ellis, 2005). Yet this most-admired animal is classified as Endangered on the IUCN Red List of Threatened Species, with an effective population size of fewer than 2,500 mature breeding individuals (Cat Specialist Group, 2002). A recent global assessment found that the Tiger now occupies just seven per cent of its historic range, with much of that range having been lost in China (Figure 1). The small known populations that remain in the north-east of China are considered the most threatened in the world (Sanderson *et al.*, 2006).

Figure 1

Historic and current range of the Tiger, *Panthera tigris*, in China



Note:

Potential habitat is defined as structural habitat as obtained from satellite-based land cover imagery, modified to exclude areas under high human impact. Human impact was calculated from the weighted sum of human population, land use and power infrastructure datasets (Human Impact Index, or HII). Each 1 km² pixel throughout the globe's land area is scored from 1 to 72, with 72 the highest (Sanderson *et al.*, 2006). For this analysis, all pixels with HII scores >15 were excluded. Still, the habitat shown may not be appropriate for reintroduction of Tigers because much of the forest shown is man-made and lacks wild prey. Protected areas within 200 km of a Tiger survey point are shown, from the 2006 WCPA Protected Areas Database.

While habitat loss and prey base declines are also responsible, the primary cause of the Tiger's endangerment has been considered to be China's traditional use of Tiger bone medicines (Mills and Jackson, 1994; Nowell, 2000). Over the past two decades, China and other countries have strengthened international and domestic trade bans, and there has been considerable investment in Tiger conservation. In some areas, these efforts have helped secure Tiger populations (Gratwicke *et al.*, 2006; Sanderson *et al.*, 2006). But others have argued that a new approach is needed to further reduce poaching pressure on wild Tigers (Mitra, 2006a), and the Government of China is currently considering legalizing domestic trade in medicines from captive-bred Tigers (Govt of China, 2006a, 2007). This report is the result of TRAFFIC's research into the effectiveness of China's long-standing trade ban, and aims to assist the government to evaluate the likely impact of any policy change on wild Tigers. TRAFFIC also studied the illegal market for Tiger and Leopard skin clothing in Tibet, recently identified as a significant new threat to big cat populations in neighbouring countries.

This Introduction provides background on China's past Tiger trade as it relates to both wild and captive Tiger populations.

China's Tiger trade and wild populations

According to China's Red Data Book of Endangered Animals (Wang, 1998), China historically was home to five Tiger subspecies (Ma, 1998):

- the South China Tiger *Panthera tigris amoyensis*, endemic to China, distributed in the subtropical mountainous regions of the southern and central parts of the country;
- the Amur Tiger *Panthera tigris altaica*, in the north-east of the country;
- the Bengal Tiger *Panthera tigris tigris*, in south-eastern Tibet and northern Yunnan;
- the Indochinese Tiger *Panthera tigris corbetti*, in Xishuangbanna and south-west China;
- and the Lop Nur/Caspian Tiger *Panthera tigris virgata*, from Xinjiang province.

The Tiger disappeared from Xinjiang in the 1920s (Ma, 1998). In the 1950s, the South China Tiger population was estimated at over 4000 (Lu and Sheng, 1986). Today, there may still be a few individuals left in the wild, based on secondary evidence such as villager reports and track sightings (Deng and Wang, 2001; Liu *et al.*, 2002; Liu and Peng, 2005). But it is generally accepted that the South China Tiger is functionally extinct, there being no viable population (Anon., 2002a; Huang *et al.*, 2003; Breitenmoser *et al.*, 2006; Sanderson *et al.*, 2006). The same conclusion can be drawn for the Bengal and Indochinese Tigers in the southwestern parts of China: while there may be a few individuals remaining, there is no conclusive evidence of breeding in the wild (Zhang *et al.*, 2002; Zhang and Su, 2005; Sanderson *et al.*, 2006). While the Amur Tiger in the north-east has lost most of its historic range (Ma, 1998), some 20 individuals still survive in the eastern parts of Heilongjiang and Jilin provinces (Zhang *et al.*, 2005; Yu *et al.*, 2000; Li *et al.*, 2001; Liu, 2005; Sun, 2005). Connectivity with the much larger Russian Tiger population is critical for the viability of China's Amur Tigers. To enable recruitment from the Russian Tiger population, conservation efforts are underway to improve habitat viability and prey availability by establishing protected areas and transboundary habitat corridors (Miquelle, 2000; Zhang *et al.*, 2005; Sanderson *et al.*, 2006).

In a relatively short period of time, China went from one of the range States with the most Tigers to the range State with the least. With its large human population, habitat loss and fragmentation are major contributing factors, along with depletion of the Tiger's wild prey base (Ma, 1998). But Tigers were also intensively hunted in the 1950 to 1960s as pests, and a bounty was paid by the government for their skins and bones (Lu and Sheng, 1986). This policy was later rescinded, and the Tiger protected from hunting in China since 1979 as a Category I protected species (this protection having been extended even earlier, in 1962, to the Amur Tiger subspecies: Lu and Sheng, 1986). China acceded to CITES in 1981. Previous protective regulations were superseded by the 1988 *Law of the People's Republic of China on the Protection of Wildlife* which became effective in 1989 (Govt of China, 1988). The Tiger was listed as a Category I protected species, affording the species the maximum level of protection from hunting, sale, purchase and use of Tigers and Tiger products. The State Forestry Administration (SFA) is the agency primarily responsible for implementation of the law, although enforcement is the responsibility of the police and Customs.

Despite this legal protection, another primary cause of the Tiger's decline in China has been the use of their bones and other parts for Chinese medicines. Chinese medicine has ancient roots and is still very commonly used, even more so than so-called "Western" medicines. The most traditional form of Tiger medicine is dried, fried bone, ground to powder in small amounts for mixing with other ingredients in various classic combinations by pharmacists and doctors. But factory techniques have modernized the production of Chinese medicines, and by the early 1990s more than 200

Figure 2



Credit: Kristin Nowell

One of many brands of Tiger bone plaster produced in China before the 1993 trade ban

companies were manufacturing Tiger bone medicines and health tonics (Li and Zhang, 1997). These took the forms of Tiger bone pills, plasters, gels and wine. The annual economic value of the Tiger medicine industry at that time was estimated by industry representatives at 100 million CNY (USD12.4 million) (Jenkins, 2006).

The Tiger bone used to make these medicines initially came from, and had a devastating effect on, China's wild Tigers. Chinese medicine industry representatives told Jenkins (2006) that: "*The annual removal of Tigers from the wild peaked in the 1960s at approximately 300 animals, yielding in the region of three metric tonnes of Tiger bone. The harvest rate declined from approximately 200 animals per annum in the 1970s to less than 100 animals per year in the 1980s. The decline in annual harvests reflected declining numbers of Tigers in the wild. At this time, poaching was non-existent as it was not illegal to kill Tigers [sic]. During this period, approximately 1000 kg of Tiger bone was used annually in the production of [traditional Chinese medicines]. In 1992, immediately prior to the ban, the stockpile increased to more than two metric tonnes and the production of Tiger bone pharmaceuticals was similarly increased to supply demand.*" The harvest rates they report agree with government fur trade records collected by Lu and Sheng (1986) for the 1960s and 1970s, but by 1979 all Tiger subspecies were protected from hunting in China and there were no longer any bounty programmes.

China acceded to CITES in 1981, and the Tiger is listed on Appendix I, which prohibits international commercial trade. No official imports of Tiger bone were recorded by China after it joined CITES (Mills and Jackson, 1994; Mulliken and Haywood, 1994). China's wild Tigers were already scarce, and there were not enough to support the domestic trade at that time. It is therefore likely that China's market in the 1980s and early 1990s was largely supplied by Tigers poached in other range States and smuggled into China (Jackson, 2000). Large seizures of Tiger bone in India and China in 1993 and 1994 support this analysis (Nowell, 2000).

As international alarm (from CITES, governments, scientists, NGOs and other experts) grew over Tiger poaching for Tiger bone medicines, China's State Council issued a special notification in 1993 strengthening protection for the Tiger (Govt of China, 1993; Mainka, 1997; Meng and Zhai, 2000). It reiterated the ban on commercial trade from the 1989 wildlife law, but took further measures to extend the ban to derivatives not readily recognizable as Tiger parts. This meant that production of all manufactured Tiger medicines was now prohibited, and that any product claiming to contain Tiger was to be treated as if it actually did. All current stocks of Tiger bone were to be declared to the government and sealed (**Table 1**).

The Government of China was lauded for this move, and in 1994, CITES adopted *Resolution Conf. 9.13* (revised at the 10th meeting of the Conference of the Parties, 1997), urging that Parties take a series of urgent measures to save the Tiger. Although the CITES treaty technically covers only international trade and not domestic trade, consensus of the CITES Parties was that bold, stricter measures had to be taken to save the Tiger, including prohibition of domestic trade in Tiger products, and this resolution was adopted by consensus. The Resolution also called for Parties to adopt adequate penalties to deter illegal trade; to treat any product claiming to contain Tiger as a readily recognizable derivative and therefore subject to CITES provisions; to support Tiger conservation

efforts, including establishment of bilateral and multilateral conservation programmes; to provide technical and financial assistance to Tiger range States; to work with traditional medicine communities; and, to engage in education and public awareness programmes (CITES, 1994).

Many governments (from both range and consumer countries) took efforts to implement this important resolution. A TRAFFIC review of implementation of this Resolution found that China had undertaken many of the key recommendations already in 1993, more so than any other range State and most other consumer states (Mainka, 1997). Meng and Zhai (2000) described some of China's actions: *"In order to carry out the notice, the State Council issued a "Notice on Prompt Punishment for Smuggling and Illegal Trade in Rhinoceros Horn, Tiger Bone and other Endangered Species." The Ministry of Forestry, the Ministry of Public Health, the State Traditional Chinese Medicine Administration Bureau, the State Administration Bureau for Industry and Commerce, General Customs Administration, and other relevant departments also circulated their respective notices for stricter enforcement of the ban. Among them, the Ministry of Public Health cancelled the pharmaceutical criteria for Tiger bone in the Pharmacopoeia of the People's Republic of China (Sinica Medica). It announced, in writing, that Tiger bone and rhinoceros horn ingredients in any prescription have been deleted. This rule was transmitted to, and adopted by, all governments at the provincial level."*

Table 1

Sealed stockpiles of Tiger bone in China, according to records of the CITES Management Authority of China

Province	Tiger bone (kg)	Date of sealing	Responsible agency
Beijing	80.4	25-01-1994	Forestry Bureau of Beijing, Forestry Bureau of Beijing
Tianjin	13.319	27-11-1993	Medicine Bureau of Tianjin, Agri-Forestry Bureau of Tianjin
Shanghai	41.6	11-01-1994	Medicine Bureau of Shanghai, Agriculture Bureau of Shanghai
Guangdong	49.7	17-01-1994	Medicine Bureau of Guangdong, Forestry Department of Guangdong
Sichuan	150. 80	20-11-1993	Medicine Bureau of Sichuan, Forestry Department of Sichuan
Hubei	151.61	01-02-1994	Medicine Bureau of Hubei, Forestry Department of Hubei
Heilongjiang	138.0	25-01-1994	Medicine Bureau of Heilongjiang, Forestry Department of Heilongjiang
TOTAL	625.429		

Source: Meng and Zhai (2000)

However, illegal trade in Tiger parts remained a problem and an international conservation priority. CITES took special action in establishing a Technical Tiger Task Force Mission (CITES, 1999) and a Tiger High-Level Political Mission (CITES, 2000). Both of these missions visited China. There was also evidence that as Tiger populations declined and as illegal trade in Tiger parts became more difficult (due to enhanced enforcement), other Asian big cat species were being increasingly used as substitutes (Nowell, 2000). In 2002, *Resolution Conf. 9.14* was superseded by *Resolution Conf. 12.5* (CITES, 2002), which extended many of the recommendations for the Tiger to the Leopard *Panthera pardus*, the Snow Leopard *Uncia uncia* and the Clouded Leopard *Neofelis nebulosa*. (CITES and many others refer to these four species as “Asian big cats”, while in Chinese the latter three species are all described as types of Leopard, due to their spots.) In China, use of Leopard bone as a substitute for Tiger bone in Chinese medicines was apparently permitted by the State Food and Drug Administration until March 2006 (Govt of China, 2007), although the Leopard, Snow Leopard and Clouded Leopard were protected from commercial trade under the *1988 Wildlife Protection Law*. Meanwhile, a significant new market for Tiger and Asian big cat skins sprang up in the Tibet Autonomous Region, arousing renewed concern at CITES over the impact of illegal trade in China on wild populations from neighbouring countries (CITES Decision 13.22: CITES, 2004).

China’s Tiger trade and captive populations

Wild Tigers are not the only potential supply source of Tiger products. Captive breeding is an important aspect of wildlife conservation in China, according to Chinese Government policy. The *1988 Wildlife Protection Law* is unusual among national laws of this type for its Article 17: “The State shall encourage the domestication and breeding of wildlife.” (Govt of China, 1988). China is well known for its successful breeding of endangered species, including the Giant Panda *Ailuropoda melanoleuca* and Père David’s Deer *Elaphurus davidianus*. However, most captive breeding in China is for commercial purposes, to produce products used in Chinese medicine, and not primarily for conservation purposes (Guo *et al.*, 1997; Green *et al.*, in press).

In recent years, captive breeding of Tigers in China has accelerated to the point where the captive population exceeds 4000 animals (Govt of China, 2006a). Three thousand specimens are reportedly held by 10–20 “significant” facilities, with the remainder scattered among some 200 facilities (Jenkins, 2006). This makes China home to the second largest captive Tiger population in the world, after the USA, which has an estimated 4,692 captive Tigers, down from an estimated 7,568 in 1997 (Werner, 2005). These two countries have a marked difference in their approach to the breeding of Tigers in captivity. In the USA, captive big cats in private ownership outside accredited zoo breeding programmes are viewed as a problem, and the government has passed legislation and is implementing regulations to reduce the size of the captive population (USFWS, 2006). In China, private Tiger ownership is growing rapidly, with national government support.

Reintroduction of Tigers to the wild is an important element of the State Forestry Administration’s (SFA) plans for conservation. It is the goal of the SFA’s South China Tiger Action Plan (SFA, 2001), developed in close co-operation with the UK-based nongovernmental organization Save China’s Tigers. While establishment of viable wild populations of this subspecies is desirable, this project has met with controversy for a number of reasons. Chief among them, perhaps, is its

unorthodox methodology: captive-bred South China Tigers are being sent to private reserves in South Africa (where Tigers are not a native species) to learn to hunt wild prey. Other problems include the lack of genetic diversity and purity of the captive population, lack of suitable habitat and wild prey base in China, and the plan to keep the Tigers in large fenced enclosures with supplemental feeding (Anon., 2003a; Wang *et al.*, 2005; Breitenmoser *et al.*, 2006).

While the South China Tiger programme is oriented toward reintroduction, the two largest Tiger breeding centres in China are primarily commercial. China is home to two captive Tiger collections which have grown to unprecedented size, both nearing or exceeding 1000 Tigers (**Figure 2a**). The first one set up in China was the Hengdao River (Hengdaohezi) Breeding Centre for Felidae, established in Heilongjiang province with government funding in 1986. It had two objectives: to breed Amur Tigers for eventual reintroduction, and to earn revenue from selling medicinal products derived from its Tigers (Conrad, 2000). In 1992 and 1994, China requested CITES recognition of the centre in order to be able to sell Tiger products on the international market, but both requests were withdrawn before presentation at the Conference to the Parties (Mainka, 1997). The centre opened a satellite game park, which has some of its Tigers on public display as a way to earn revenue.

Recent plans for reintroduction of Amur Tigers from the Hengdao River Breeding Centre have been announced. According to an official from the breeding centre, they will begin training the centre's 620 Tigers for release into the wild in a 15 ha fenced area near the North Korean border (Anon., 2006a). Previously, 12 Tigers from the Harbin centre were rented and released into a fenced private park, the Changbai Mountain Siberian Tiger Park, where they killed a worker in 2002 (Anon., 2002b). Called a "trial release," now all but two are back in captivity (Anon., 2006a). The Heilongjiang and Jilin Provincial Forestry Bureaus were part of a scientific working group that drew up a proposed recovery plan for the Amur Tiger. The recovery plan focuses on the conservation of remaining wild populations (and their habitat and prey) and did not include reintroduction (Zhang *et al.*, 2005). A noted Tiger specialist at the Heilongjiang Provincial Wildlife Institute, commenting on the planned training for reintroduction, was reported to have said that it would be more meaningful to invest the funds in habitat protection (Anon., 2006a).

The other large captive collection of Tigers in China is housed in the Xiongsen Bear and Tiger Mountain Village in Guilin, owned by Zhou Weisen and financed by private investment. Zhou Weisen, a former snake trapper turned wildlife breeder, reportedly told a newspaper that his aim was to become "the Tiger-rearing King of the World," (Anon., 1999a). His facility has reportedly received CNY7.5 million (USD930,000) in state financing and has been designated an official breeding centre for Tiger reintroduction (CCTV, 2003; Luo, 2005, Zhang, 2006; CCTV, 2006). However, only a few of his Tigers have been incorporated into an official reintroduction programme (Anon., 2002c). As with Hengdao River Breeding Centre, Xiongsen Bear and Tiger Mountain Village has licences from the State Forestry Administration for non-commercial purposes (e.g., tourism, education, conservation) (Jenkins, 2006) (**Figure 3**).

The growth of the captive Tiger populations in the two centres has been rapid. Hengdaohezi began in 1986 with eight Tigers; Xiongsen Bear-Tiger Mountain Village began in 1992 with 12 (Nowell, 2000). By 2002, each population was approximately 300 Tigers, and by 2006, nearing or exceeding

Figure 2a

Number of Tigers at China's two largest breeding centres, 1986 to 2006. Lines show the growth trends at the two facilities

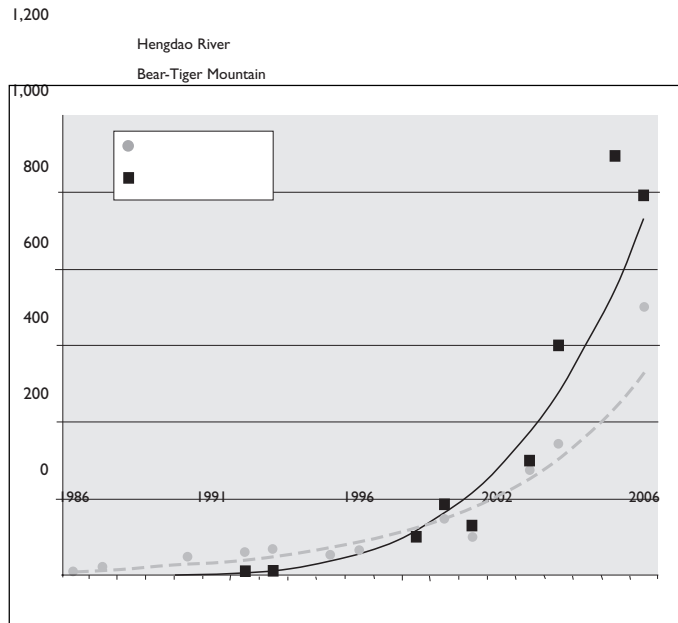
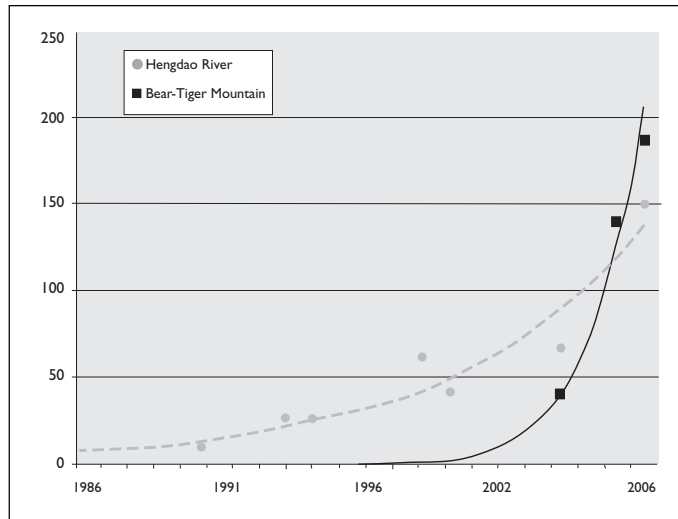


Figure 2b

Number of Tiger carcass stockpiles at China's two largest breeding centres, from 1986 to 2006. Lines show the growth trends at the two facilities



Note:

The data points used here are derived from a range of sources, so the trend over time should be viewed as indicative only. The midpoint was used for multiple sources for the same year. Data points from 1986–1999 are from Nowell (2000: Tables 16 and 17). Other sources include Conrad (2000), Meng and Zhai (2000), CCTV (2003), Cui (2003), Luo (2005), Anon. (2006c), Anon. (2006i), CCTV (2006), Green *et al.* (in press), K. Conrad pers. comm. (2006).

1000 (**Figure 2a**). Both centres have complained that they cannot afford to support such large populations (Cui, 2003; CCTV, 2003; Luo, 2005; Anon., 2006b,c). Both centres have large freezers where the carcasses of Tigers that have died in the facilities are being stockpiled (**Figure 2b**).

In August–September 2005, articles in both the Chinese and international press reported that the Chinese Government was considering lifting the ban to allow a limited trade in products derived from captive-bred Tigers (Anon., 2005a; Zhang, 2005). This was denied by the State Forestry Administration as “completely groundless” according to news reports in October (Anon., 2005b,c).

However, in June 2006 a group of foreign delegates were invited to China by the SFA’s Department of Wildlife Conservation to advise the government on legalizing domestic trade in captive-bred Tiger medicines (Conrad, 2006; Jenkins, 2006; Meacham, 2006; Mitra, 2006a,b). The delegation was informed that the government had received a petition in October 2005 from unnamed domestic interests to review the effectiveness of the 1993 domestic trade ban (Conrad, 2006; Jenkins, 2006). The 2004 *Public Administration Act* (which aims to improve government accountability) requires any government agency, receiving an enquiry or petition from the public to respond within 90 days of the date of receipt. Interim responses may be issued to provide additional time to research complex issues. As part of the SFA’s research process, the foreign delegation was taken to the two largest Tiger captive breeding centres (Hengdao River Breeding Centre and Xionsen Bear-Tiger Mountain), the Beijing Tong Ren Tang Pharmaceutical Company, Chinese medicine markets and hospitals, law enforcement agencies in Beijing and Guilin and the North-east Forestry Research Institute in Harbin (Conrad, 2006; Jenkins, 2006; Meacham, 2006).

Figure 3



Credit: Tom Milliken, TRAFFIC

Performing Tigers at the Xionsen Bear and Tiger Mountain Village

The international community learned of the policy review at the 54th meeting of the CITES Standing Committee in Switzerland in October 2006. In a statement released at the meeting, the Government of China said, “*The efforts made by governments and the international community over the last decade seem to have failed with the number of wild populations of Tigers continuing to decrease. Information of this type has stimulated strong petitions questioning whether the present policy is the right approach for addressing protection of wild Tigers, at a time when the captive bred population of Tigers in China exceeds 4,000 individuals. It is the responsibility of a government agency to respond to the petitions and questions. As a consequence, policy review and research is underway. Decisions on the outcome of this review process will be based on the fundamental principle that any decisions must benefit protection of Tigers in the wild and fight against illegal trade in this species and other wildlife*” (Govt of China, 2006a).

In January 2007, a spokesperson for the State Forest Administration told the Xinhua national press agency that the government had no intention of easing its 1993 trade ban, but that China “welcomed well-researched advice or comments from experts and anyone who cares about the fate of wild Tigers” (Anon., 2007). That same month China’s CITES Management Authority reported to CITES that “...the Chinese Government is assessing its [tiger trade ban] policy with a primary principle that it should be more beneficial to the global conservation and population resumption of the wild Tiger” (Govt of China, 2007: 8).

To assist the government’s policy review, TRAFFIC examines the arguments for legalization in the section on Tiger policy, scientifically assessing the likely impact on wild Tigers and illegal trade.

METHODS

The current study used several methods to collect information on the market for Tiger and Leopard products in China, following methodologies and target areas recommended by TRAFFIC’s global Tiger trade review *Far From A Cure: The Tiger Trade Revisited* (Nowell, 2000). In the Chinese medicine market, the term “Leopard” is used to refer to three species: the Leopard, Snow Leopard and Clouded Leopard.

The first method was directly surveying Tiger markets, both traditional medicine markets and skin markets. Markets for traditional medicines were assessed for current availability of raw Tiger bone to consumers across China. The survey focused on raw Tiger bone because it is the most traditional form of Tiger bone medicine; because manufacture of Tiger bone medicines was prohibited in the early 1990s; and because seizures indicate a continued flow of Tiger bone into China. The surveys were carried out from September 2005 to July 2006. Major cities as well as smaller towns were visited (**Figures 4 and 5**). A Chinese researcher and a local guide went to both retail and wholesale Chinese medicine sellers, often located in several different districts, to help ensure maximum coverage within large cities.

At the retail pharmacies, a prescription was presented. This was written by a doctor from a well-known Chinese university of traditional medicine, who co-operated with the study. The prescription was composed of 10 ingredients which included 15 g of raw powdered Tiger bone, as well as 0.5 g

of musk, the remainder comprising plant ingredients. If Tiger bone was not available, the researcher inquired about Leopard bone instead. If Tiger bone was available, the researcher asked if it was possible to substitute Leopard bone, in order to reduce the cost.

If either Tiger or Leopard bone was available, the researcher asked about the price for this individual item, and the source. Comments by the proprietor were written down afterwards, with particular attention paid to whether the 1993 trade ban was mentioned. (The researcher did not ask if the proprietor knew about the ban if the proprietor didn't mention it.) If Tiger or Leopard bone was available, the researcher did not purchase it as it was deemed too expensive. If manufactured Tiger or Leopard bone medicines were offered instead of raw bone, the researcher asked about the price and the source.

At the wholesale markets, the researcher posed as a possible commercial buyer from a distant city, and asked about the availability of the target species.

Shopkeepers claiming to stock Tiger and Leopard bone were not asked to show it to the researcher, although some did voluntarily. Although genuine raw bone was seen, it was not possible to verify whether it was actually derived from the authentic target species. It is possible that not all of the

Figure 4

Towns and cities where retail Chinese medicine shops were surveyed in 2005–2006

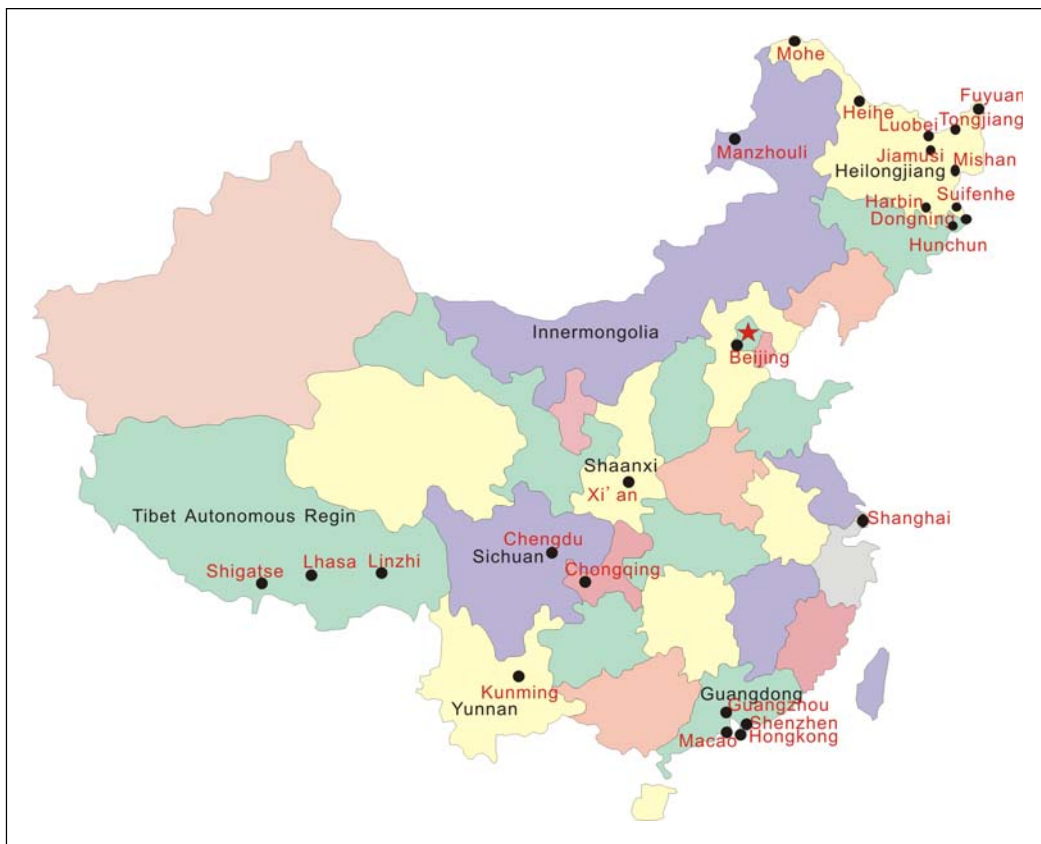


Figure 5

Cities where wholesale medicine markets were surveyed in 2005–2006



businesses that claimed to stock Tiger or Leopard bone actually did, and claiming to stock is more suggestive of willingness to trade rather than actual trade volumes. In the results, businesses where products were actually seen are separated from those claiming to stock.

Surveys were also carried out in skin markets in several areas in the Tibet Autonomous Region, in August 2005 and July 2006. The Chinese researcher, with a local guide, visually inspected fur markets and *chuba* tailors and also inquired about the availability, when none was seen, of Tiger and Leopard skins. The researcher also inquired about price and source when traders said Tiger or Leopard skins were available. The researcher was trained in discrimination of genuine and fake furs. As with Chinese medicine shops, not all skin traders who claimed to stock big cat skins actually showed their stocks, and these two types of availability are separated in the analysis of results.

To investigate news reports of illegal trade in Tiger bone wine at the Xionsen Bear and Tiger Mountain Tiger breeding centre and its associated Xionsen wine production facility, TRAFFIC researchers visited these facilities in September and October 2006.

The second method used questionnaires. This method was used to gain insight into the characteristics and motivations of potential Tibetan consumers in the Lhasa area of the skins of several wild

species. The researchers visited a selection of residential communities to administer a short questionnaire. Information was collected on the respondents' age, educational background, occupation, income, consumption of Tiger, Leopard, and otter skin clothing, reasons for such, and awareness of endangered species conservation and illegal trade.

A wide-ranging literature review was carried out to supplement consumer and market surveys. This method was used to collect existing public information about Tiger conservation and trade issues in China. The primary sources were from the scientific literature, from China as well as other countries. The primary sources have been peer-reviewed and are considered highly reliable. Press sources, often from internet news searches, are acknowledged as less reliable since their accuracy has not gone through peer review.

A fourth method was DNA testing, carried out during October to November 2006 on two bottles of the Xionsen Wine Company's Bone-Strengthening Wine to determine if the contents included Tiger. DNA was extracted using two methods (phenol chloroform extraction and nucleic acid ethanol precipitation reagent). Four felid-specific primers (approximately 100 to 200 base pairs in length) were designed based on published felid DNA sequences in Genbank. Both touchdown and nested polymerase chain reaction amplification (PCR) were carried out by experienced professionals at the Kunming Institute of Zoology (2006).

Prices and other financial figures are given in both Chinese yuan (CNY) and US dollars (USD), using the exchange rate of CNY1=USD0.124 as of 1 January 2006 <www.oanda.com>. Prices have not been adjusted for inflation.

TRAFFIC SURVEYS: RESULTS AND DISCUSSION

Tiger bone: Chinese medicine markets

Retail Chinese medicine shops

A total of 523 retail Chinese medicine shops or pharmacies were surveyed for availability of the most traditional form of Tiger and Leopard bone: unprocessed powder mixed to order with other ingredients in a recognized formula. In most cities, 40 shops were surveyed. A total of 11 major cities were surveyed, as well as several smaller cities in north-eastern China and Tibet. The results are shown in **Tables 2** and **3** (except for Macau, where the sample size of five shops was too small to permit comparison with the other survey locations).

Very little Tiger or Leopard bone was available across China. Tiger bone or Tiger bone medicines were not displayed openly at any of the shops surveyed. Only two shops (both in Tibet) showed raw Tiger bone to the researcher on request. Because the researcher did not purchase the prescription carried, not all shops claiming to stock raw Tiger bone showed the bone to the researcher. A total of 2.5 per cent of 518 shops claimed to stock Tiger bone (**Table 2**).

Similar to Tiger bone, Leopard bone was seen in only a small number of shops (raw Leopard bone was seen in three shops in Tibet and four in Chongqing; **Table 3**). In one shop in Tibet, the Leopard

Table 2**Availability of raw Tiger bone in Chinese medicine shops in 2005–2006 and awareness of trade prohibition**

Place	Availability of raw Tiger bone					Awareness of Tiger protection and/or trade ban	
	Number of shops surveyed	Number of shops claiming to stock	Percent of shops	Number of shops showing on request	Percent of shops	Number of shops	Percent of shops
Beijing	40	0	0	0	0	36	90%
Chengdu	40	2	5%	0	0	23	58%
Chongqing	40	1	3%	0	0	16	40%
Guangzhou	40	0	0	0	0	28	70%
Harbin	40	2	5%	0	0	28	70%
Hong Kong	40	0	0	0	0	30	75%
Kunming	40	0	0	0	0	33	83%
North-eastern China*	84	2	3%	0	0	43	51%
Shanghai	40	0	0	0	0	32	80%
Shenzhen	40	0	0	0	0	19	48%
Tibet*	34	4	12%	2	6%	21	62%
Xi'an	40	2	5%	0	0	23	58%
Total	518	13	2.5%	2	0.4%	332	64%

*Several towns surveyed in these areas, see **Figure 4**

bone was said to be Snow Leopard. A higher but similarly small proportion of shops across China claimed to stock Leopard bone (five per cent) in comparison to Tiger bone (2.5 per cent). No processed Leopard bone medicines were seen or offered. It was not possible for the researcher to determine if any of the raw bone was from the species purported, or if any of the processed Tiger bone products actually contained Tiger bone.

Many of China's major cities had no Tiger or Leopard bone available. In five major cities—Beijing, Guangzhou, Shanghai, Kunming and Shenzhen—no shopkeepers claimed to sell Tiger bone (45% of 11 major cities), and none claimed to sell Leopard bone in seven major cities (63%). Among the areas where shops did claim to sell Tiger and Leopard bone, Tibet stands out for the number of shops claiming to have (12%) and showing (6%) both types of bone. Chongqing stands out as a city with a relatively high availability of Leopard bone (23% of shops claiming to sell, and 10% displaying), in comparison to Tiger bone (three per cent of shops claiming to sell and none seen). Chengdu and Xi'an had relatively high proportions of shops claiming to sell Leopard bone, although this was not visually confirmed.

While the survey focused on raw Tiger bone, processed medicines were occasionally offered by shopkeepers. Two types of processed were seen: Tiger bone gel and Tiger bone wine. Tiger bone plaster, a type of external poultice produced in large quantities in China prior to the 1993 trade ban,

Table 3**Availability of raw Leopard bone in Chinese medicine shops in 2005–2006 and awareness of trade prohibition**

Place	Availability of raw Leopard bone					Awareness of Leopard protection and/or trade ban	
	Number of shops surveyed	Number of shops claiming to stock		Number of shops showing on request		Number of shops	Percent of shops
		Number	Percent of shops	Number	Percent of shops		
Beijing	40	0	0	0	0	26	65%
Chengdu	40	5	13%	0	0	19	48%
Chongqing	40	9	23%	4	10%	10	25%
Guangzhou	40	0	0	0	0	28	70%
Harbin	40	1	3%	0	0	11	28%
Hong Kong	40	0	0	0	0	30	75%
Kunming	40	0	0	0	0	32	80%
North-eastern China*	84	0	0	0	0	39	46%
Shanghai	40	1	3%	0	0	25	63%
Shenzhen	40	0	0	0	0	19	48%
Tibet*	34	4	12%	3	6%	20	59%
Xi'an	40	6	15%	0	0	21	53%
Total	518	26	5%	7	1%	280	54%

*Several towns surveyed in these areas, see Figure 4

was not seen anywhere during the survey. Tiger bone gel was the only form of Tiger bone medicine seen in Hong Kong (one shop) and Macau (one shop). This type of Tiger bone medicine has not been previously reported from China, but instead primarily from South-east Asia. It is the most common form of Tiger bone medicine in Viet Nam and has also been seen in Malaysia. Macau and Hong Kong previously have been reported as suppliers (among others) of processed Tiger bone gel to these markets (e.g., one type of Tiger bone gel sold in Vietnam is traded under the name “Hong Kong gel” (Nowell, 2000). Hong Kong did report seizing Tiger bone gel in the early 1990s (Nowell, 2000). It is doubtful, especially considering the low price, whether most Tiger bone gel products actually contain genuine Tiger bone (Table 4; Nowell, 2000). Leopard bone was not available in either Hong Kong or Macau.

Tiger bone wine was seen only once, at a shop in Suifenhe in north-eastern China. The label indicated a manufacture date of 1992 (i.e., before the 1993 trade ban), with an approval number of the Heilongjiang Health Medicine Bureau. Called Huangbai North-east Tiger Bone Wine, the bottle package stated that it had been made from a Tiger found dead in the wild (Figure 6).

The average retail price quoted for raw Tiger bone in this survey was CNY53 (USD6.52) per gramme (Table 4). There was wide variation in price (Figure 7), especially in Tibet: two dealers said CNY10

Table 4

Retail prices for Tiger and Leopard bone products (prices in CNY per gramme) in 2005–2006

Product	Average price (sample size)	Standard deviation	Price range
Raw Tiger bone	53.3 (6)	67.7	10–180
Tiger bone gel	3.6 (5)	2.4	0.53–5.33
Tiger bone wine	150 (1)	n/a	n/a
Raw Leopard bone	7.0 (24)	16.5	1–80

Figure 6



Credit: TRAFFIC

Tiger bone wine sold in north-eastern China with pre-ban manufacture date showing a dead Tiger on the label

(USD1.24) per gramme, one said CNY80 (USD9.92), and another quoted CNY180 (USD22.32) per gramme. Outside Tibet, the only other price points for raw Tiger bone were CNY10 per gramme quoted in Xi'an, and CNY30 (USD3.72) per gramme quoted in Heihe (north-eastern China). In contrast, Tiger bone gel was markedly cheaper than raw bone at CNY3.6 (USD0.45) per gramme. And Tiger bone wine was the most expensive type of Tiger bone product available (Table 4).

Leopard bone prices showed less disparity than Tiger bone prices (Table 4 and Figure 8). Most prices (n=18) were lower than CNY3.6 per gramme. The average is skewed higher by one high price in Tibet (CNY80 per gramme), from the same shop that also quoted the highest price for Tiger bone.

Most pharmacies were aware (in that they voluntarily showed awareness) of the 1993 trade ban as the government's Tiger conservation policy, with 332 shopkeepers (64% of shops surveyed) mentioning some aspect of this policy to the researcher (Table 2). In six cities, over 70% of shopkeepers indicated awareness. High levels of awareness are broadly correlated with low levels of availability. However, all the shopkeepers claiming to stock Tiger bone in Chengdu, Hong Kong, and the Tibet Autonomous Region mentioned the ban; while none of the shopkeepers selling Tiger bone in the other areas did. Overall, awareness that Leopards are also protected species was high, but slightly lower than for Tigers (54% of shops surveyed, Table 3). It is possible that levels of awareness are even higher, but that shopkeepers did not mention it to the researcher. Also, prohibition on trade in Leopard bone had only recently been strengthened (Govt of China, 2007) when the survey was carried out.

Figure 7

Number of sellers quoting in different price categories for Tiger bone

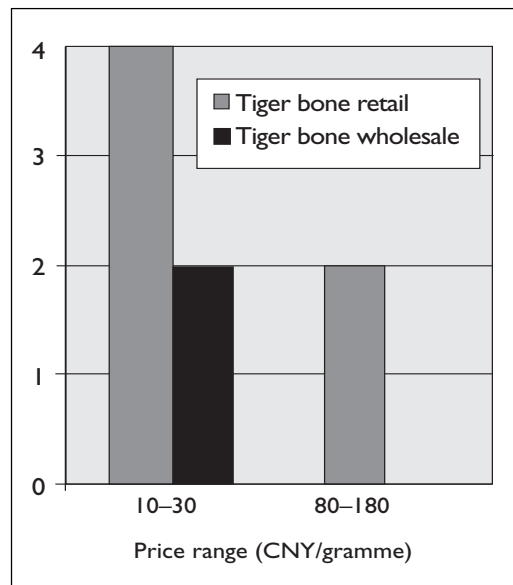
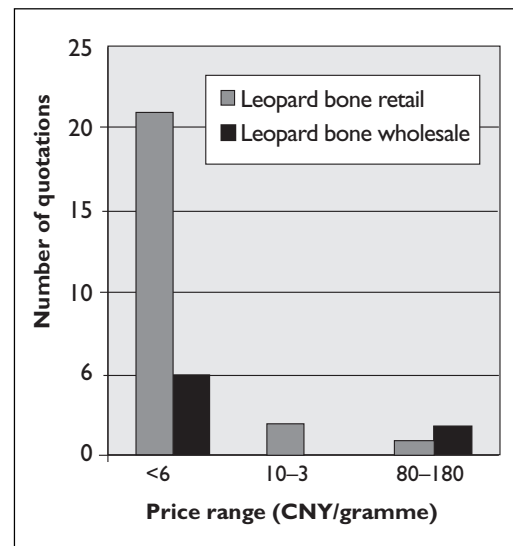


Figure 8

Number of sellers quoting in different price categories



Wholesale markets

A total of 140 dealers located in seven major wholesale markets selling raw materials used in Chinese medicine were surveyed for availability of raw (unprocessed) Tiger and Leopard bone. Twenty dealers were surveyed in each market. The results are shown in **Tables 5** and **6**, and correlate with results at the retail level in that very little Tiger or Leopard bone was seen for sale or claimed to be available. No Tiger bone was seen in the wholesale survey; Leopard bone was only seen once. Two per cent of dealers claimed to stock Tiger bone, and six per cent claimed to stock Leopard bone. These percentages are similar to the 2.5 per cent of retail shops claiming to stock Tiger bone, and five per cent claiming to stock Leopard bone.

Three markets—those in Guangzhou, Harbin and Xi’an—had no Tiger or Leopard bone for sale. This is consistent with retail shops surveyed in Guangzhou, which had no Tiger or Leopard bone for sale either. However, both Harbin and Xi’an had a few retail shops claiming to sell Tiger and Leopard bone. Shopkeepers said they were “unsure” of the source of this bone.

Owing to low availability, few price datapoints were collected at the wholesale level for Tiger and Leopard bone (**Table 7** and **Figures 7** and **8**). The average wholesale price of Tiger bone was

Table 5

Availability of Tiger bone in wholesale markets selling raw materials used in Chinese medicine in 2005–2006 and awareness of trade prohibition

Place	Availability of Tiger bone					Awareness of Tiger protection and/or trade ban	
	Number of shops surveyed	Number of shops claiming to stock	Percent of shops	Number of shops where Tiger bone was seen	Percent of shops	Number of stalls	Percent of stalls
Hebei: Anguo Market	20	1	5%	0	0	10	50%
Chengdu: Hehuachi Market	20	1	5%	0	0	5	25%
Chongqing: Jiefanglu Market	20	0	0	0	0	4	20%
Kunming: Juhuayuan Market	20	1	5%	0	0	7	35%
Guangzhou: Qingping Market	20	0	0	0	0	3	15%
Harbin: Sankeshu Market	20	0	0	0	0	4	20%
Xi’an: Wanshoulou Market	20	0	0	0	0	5	25%
Total	140	3	2%	0	0	38	27%

Table 6**Availability of Leopard bone in Chinese medicine wholesale material markets in 2005–2006 and awareness of trade prohibition**

Place	Availability of Leopard bone					Awareness of Leopard protection and/or trade ban	
	Number of shops surveyed	Number of shops claiming to stock	Percent of shops	Number of shops where Leopard bone was seen	Percent of shops	Number of stalls	Percent of stalls
Hebei: Anguo Market	20	4	20%	0	0	9	45%
Chengdu: Hehuachi Market	20	2	10%	0	0	5	25%
Chongqing: Jiefanglu Market	20	1	5%	1	5%	4	20%
Kunming: Juhuayuan Market	20	1	5%	0	0	6	30%
Guangzhou: Qingping Market	20	0	0	0	0	3	15%
Harbin: Sankeshu Market	20	0	0	0	0	0	0
Xi'an: Wanshoulou Market	20	0	0	0	0	4	20%
Total	140	8	6%	1	0.7%	31	22%

Table 7**Prices for Tiger and Leopard bone (CNY/gramme) in wholesale Chinese medicine markets in 2005–2006**

Product	Average price (sample size)	Standard deviation	Price range
Tiger bone	10 (2)	0	n/a
Leopard bone	27.6 (7)	43.1	0.9–100

CNY10 (USD1.24) per gramme, much lower than the average retail price. Most quoted wholesale prices per gramme for Leopard bone (n=5) were less than CNY5 (USD0.62), equivalent to or lower than retail prices in major cities. The exceptions, which skew the average wholesale price for Leopard bone higher than Tiger bone, are two significantly higher prices, of CNY80 (USD9.92) and CNY100 (USD12.40) per gramme, in Anguo Market, Hebei province (northern China, not far from Beijing).

In comparison to the retail level, fewer wholesale dealers mentioned awareness of the ban to the researcher (27% showing awareness of the Tiger trade ban, and 22% showing awareness of the Leopard trade ban, **Tables 5 and 6**). The reasons for this are unclear. It could reflect a lower level of awareness among the wholesale segment of the market. However, few dealers carried Tiger or Leopard bone, which does suggest that most are aware of the trade ban. The ban was mentioned most frequently by wholesale dealers in the Anguo Market— including by the two dealers selling the expensive Leopard bone.

China's medicine markets over time

While Tiger bone medicines were known to be widely available in China prior to the 1993 ban— e.g., with over 200 companies manufacturing products containing Tiger bone (Li and Zhang, 1997)— there are few survey data to quantify the consumer market in these years. Mills (1997) obtained a 1993 pre-ban price list from the Anguo wholesale market that included prices for both Tiger and Leopard bone. Johnson *et al.* (1993) found raw Tiger bone in four locations in three cities (16%, or four out of 25 pharmacies visited) and Tiger bone wine in seven locations in five cities (28% of pharmacies visited).

After the ban, however, a series of systematic surveys were carried out by Chinese researchers for TRAFFIC East Asia (Mills, 1997). Two methods were used, similar to this study: a visual scan for Tiger medicines on display, and a request for manufactured Tiger bone medicines (Tiger bone wine and/or Tiger bone plaster). These surveys did not use a prescription and did not request raw Tiger bone. Mills (1997) also recorded instances where merchants mentioned awareness of the 1993 ban, as did this survey. In addition, a TRAFFIC survey of shops in Hong Kong was conducted in 1999, with a researcher requesting Tiger bone medicines (Anon., 1999b).

Although the type of Tiger bone medicine targeted by the two sets of TRAFFIC surveys differ (raw bone in 2005/2006 vs. manufactured medicines in 1994–1996), the surveys can be compared to provide a general idea about availability of Tiger bone medicines in the Chinese market over time (**Table 8**). The highest availabilities were found in 1994, one year after the 1993 trade ban. Shopkeepers reported to Mills (1997) that sale of prohibited items in the months after the ban were often in an effort to get rid of existing stocks only, rather than an indication of long-lasting defiance of the ban. Most shopkeepers said they would not be getting any new stocks. After 1994, Tiger bone medicines seen on request fell from seven per cent in 1995 to three per cent in 1996 and less than one per cent 10 years later, in 2005 to 2006. The percentage of shops claiming to stock Tiger bone medicines in 2005 to 2006 (three per cent) is as low as the levels of illegal trade seen 10 years previously. Few shops had Tiger bone medicines on open display in the mid-1990s, compared with the early 1990s, and none had Tiger bone medicines on open display in 2005 to 2006.

Table 8

Availability of Tiger bone medicines in Chinese medicine shops over time according to surveys: Per cent of shops (total number shops surveyed)

Place Survey Method	2005–2006			1999	1996		1995		1994		
	Claimed to stock*	Seen on request*	Displayed	Seen on request	Seen on request	Displayed	Seen on request	Displayed	Seen on request	Displayed	
Beijing	0 (40)	0 (40)	0 (40)	18% (33)	0 (45)	0 (49)	4%(28)	0 (42)	30% (10)	0 (53)	
Chengdu	5% (40)	0 (40)	0 (40)		0 (41)	0 (53)	0 (31)	0 (49)	4% (26)	2% (53)	
Chongqing	3% (40)	0 (40)	0 (40)						9% (23)	5% (39)	
Guangzhou	0 (40)	0 (40)	0 (40)					0 (22)	0 (44)		
Guilin										15% (13)	0 (25)
Guiyang								14% (43)	0 (53)		
Harbin	5% (40)	0 (40)	0 (40)								
Hong Kong	10% (40)	3% (40)	0 (40)								
Kunming	0 (40)	0 (40)	0 (40)							8% (26)	4% (56)
Macau	20% (5)	20% (5)	0 (5)								
Nanchang						16% (25)	0 (33)	0 (9)	15% (26)	25% (4)	5% (20)
Nanjing										5% (19)	7% (27)
Nanning								38% (8)	0 (29)		
North-eastern China**	3% (84)	1% (84)	0 (84)								
Shanghai	0 (40)	0 (40)	0 (40)			0 (7)	0 (25)			0 (26)	0 (33)
Shenzhen	0 (40)	0 (40)	0 (40)						0 (10)		
Tianjin						6% (16)	1 (35)	9% (11)	0 (32)	0 (11)	0 (42)
Tibet**	12% (34)	6% (34)	0 (34)								
Xiamen										19% (21)	0 (33)
Xi'an	5% (40)	0 (40)	0 (40)		0 (40)	0 (50)	3% (35)	0 (44)	7% (25)	6% (48)	
Zhengzhou					3% (30)	0 (35)	10% (20)	0 (26)	0 (4)	0 (10)	
Total	3% (523)	<1% (523)	0 (523)	n/a	3% (204)	<1% (280)	7% (207)	1% (355)	18% (208)	3% (439)	

Sources: 1994–1996—Mills (1997); 1999—Anon. (1999b); 2005–2006—this survey

* Figures differ from those in Table 2 due to inclusion of Macau, and to processed Tiger bone medicines

** Several towns surveyed in these areas, see Figure 4

Table 9

Availability of Tiger bone medicines over time in China's wholesale medicine markets

Survey date	Number of vendors seen with Tiger bone medicines (total number of vendors surveyed)	Percent
1994	6 (±154)	4%
1995	3 (±117)	3%
2005–2006	0 (140) (seen); 3 (140) claimed to stock	0–2%

Sources: 1994–1996—Mills (1997); 2005–2006—this survey

Table 9 shows availability of Tiger bone medicines over time at the wholesale level. The per cent of wholesale vendors showing Tiger bone medicines fell from four per cent in 1994 to three per cent in 1995 and zero in 2005–2006 (although two per cent of dealers surveyed still claimed to stock raw Tiger bone). In 1994, three vendors claimed to be able to obtain raw Tiger bone, but no raw Tiger bone was actually seen in the 1994 or 1995 wholesale surveys, and no raw Tiger bone was seen in the 2005–2006 survey.

The low availability of Tiger bone medicines in Chinese medicine outlets at both the retail and wholesale levels over time suggests that the consumer market declined quickly following the 1993 ban and has remained small, and that most medicine dealers are not risking breaking the law by carrying stock or seeking new customers.

Table 10 shows awareness of the 1993 trade ban for Tiger bone over time. Awareness was lowest (just under 50%) in 1994, immediately after the ban was imposed, and has since remained steady at about 60%. These results could underestimate awareness as they refer only to shopkeepers who spontaneously mentioned the ban to investigators. This shows that China’s government, medicinal and conservation communities have been very successful at communicating the ban to the primary distributors of traditional medicines.

Table 11 shows wholesale and retail prices for raw Tiger bone over time. With such low availability of Tiger bone in the markets, it is difficult to collect price data and there are few data points. TRAFFIC’s surveys found wide ranges in Tiger bone prices. These disparities are difficult to explain: they could reflect genuineness of the item (with more expensive prices more likely to be genuine Tiger). It is not possible to determine with certainty how the price of illegal Tiger bone has changed over time. There is no clear evidence that the price has increased (as might be expected given the Tiger’s rarity and the difficulty in obtaining Tiger bone). There is also no clear evidence that the price has declined, as might be expected with declining demand. The price disparities suggest a market that is chaotic and disorganized, with no rational pricing structure.

TRAFFIC surveys over time have found little evidence of illegal Tiger bone trade at both the wholesale and retail level, and widespread awareness of species protection and trade prohibition. The vast majority of China’s traditional medicine community is in compliance with the 1993 trade

Table 10

Awareness of the 1993 Tiger bone trade ban over time

Year	Percent of shops aware of ban (total number of shops surveyed)
2005–2006	64% (523)
1996	58% (373)
1995	60% (306)
1994	49% (230)

Sources: 1990s—Mills (1997); 2005–2006—this survey.

Table 11**Wholesale and retail prices (USD/kg) for raw Tiger bone in China over time**

	Early 1990s	Late 1990s	2005–2006
Wholesale price range	404–539	126–172	1,250
Retail price range	1,106–1,950	2,425	1,250–22,500 ¹ 1,250–3,750 ² 1,250 ³

Sources: All 1990s prices as reported in Nowell (2000: Table 28); 2005–2006: this survey. Prices have not been adjusted for inflation.

1. Includes high prices at two shops in Tibet which showed their stocks to investigator (n=6 shops)
2. Price range with the two Tibetan shops removed (n=4 shops)
3. Price with two Tibetan shops and one north-eastern China shop removed (n=3 shops)

ban. Perhaps some shops continue to sell Tiger bone medicines undercover to known customers. However, it is clear that the market for Tiger bone medicines in China has declined greatly since the early 1990s, and there appears to be little current demand (as measured by willingness of shops to sell Tiger bone illegally). China’s trade ban can be judged to have been successful over time at virtually eliminating the domestic market for Tiger bone medicines.

Tiger skins: the clothing trade in Tibet

While Tiger bone has been used for centuries in Chinese medicine, the extensive use of Tiger and Leopard skins for clothing in Tibet is a new market, in that only recently did big cat skins come to be a favoured form of adornment for the general public. There is a long tradition, especially in the Kham region, of wearing animal skin clothing. And there is an ancient tradition in the Tibetan military, where Tiger skins comprised the ‘Six Indicators of Bravery’—as upper garment, lower garment, scarf, cloak, and in the saddle and saddle blanket. But only since the 1990s, with an improving economy and traditional costumes in fashion, did the market for Tiger and Leopard skin-trimmed *chubas* (cloaks) spread widely in Tibet to become a serious threat (Tsering, 2006). Large skin seizures coming from Nepal and India since 2000 have indicated a high volume of illegal trade (see section on Tiger smuggling). Leopard skin *chubas* were seen for sale in Lhasa in 2003 and 2004 (Banks and Newman, 2004). But world attention focused on Tibet in 2005, when photographs of Tibetans wearing Tiger skin costumes at festivals were first widely distributed (Anon., 2005d). The open nature of Tibetans selling and wearing Tiger skin clothing was considered to be scandalous and unusual, because Tiger skin consumers tend to act covertly—skins are seized from traders, and occasionally seen in markets, but the end consumer has tended to be elusive.

Understanding the consumer market

To understand consumption patterns and motivations, a team of Tibetan researchers working for the WWF office in Lhasa and collaborating with TRAFFIC, undertook consumer attitude surveys in Lhasa, Nagchu and Ngari (Tsering, 2006). A total of 370 interviews were carried out. Equivalent

Table 12**Analysis of the possession of skin-trimmed clothing by locality**

	Tiger skin	Leopard skin	Otter skin
Lhasa (n=157)	3 (1.9%)	3 (1.9%)	30 (19.1%)
Ngari Retired (n=67)	2 (3.0%)	3 (4.5%)	35 (52.2%)
Nagchu (n=146)	6 (4.1%)	16 (11.0%)	99 (67.8%)
Total (n=370)	11 (3.0%)	22 (5.9%)	164 (44.3%)

numbers of males and females were interviewed, of all educational levels. Government officials formed an important segment of the interviewees (27%), as did retirees (19%). Others were farmers (12%) or unemployed (16%); relatively few described their occupation as “company employee” (4%) and “self-employed” (6.5%).

The survey found that as a proportion of the public, relatively few people living in and around the Tibetan capital own big cat skin clothing—three per cent claimed to have Tiger skins and six per cent Leopard skins, as compared to 44.3% that owned otter skins (**Table 12**). The proportion of people claiming to own Tiger skin and Leopard skin clothing was highest in Nagchu.

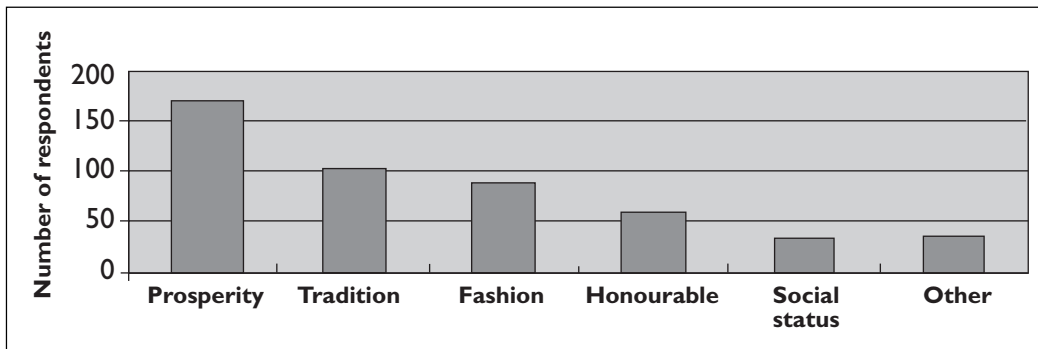
While wealthier consumers possessed more skin garments, on average, people from all income classes owned Tiger or Leopard skins (**Table 13**). Although Tiger and Leopard skins were much more expensive than otter skins, wealthier people were not more likely to own them than poorer people. There was also no strong tendency for a particular occupation class or educational level in ownership of Tiger or Leopard skin clothing. To show prosperity was the main reason indicated by interviewees for wearing animal skin clothing (followed by tradition, then fashion: **Figure 9**). No information was collected on when or where interviewees acquired their Asian big cat skin clothing.

Table 13**Number of people surveyed claiming to own skin-trimmed clothing possession by monthly family income cohort**

Clothing type	Income cohorts (CNY)						Total
	<1000	1000–1999	2000–2999	3000–3999	4000–4999	>5000	
Tiger skin clothing	1	3	4			3	11
Leopard skin Clothing	3	3	5	4	2	5	22
Otter skin clothing	41	22	23	16	18	43	163

Figure 9

Reasons people buy and wear skin products in Tibet



Source: Tsering, (2006)

Most people were aware of the endangered status of big cats, understood that the trade was illegal, and knew of China’s wildlife conservation law. There was a clear correlation between higher awareness and higher levels of education (Table 14).

Table 14

Wildlife law awareness according to educational level

Education level	Endangered wildlife trade is illegal	Poaching wildlife is illegal	China has wildlife protection law
Illiterate (n=94)	64 (68.1%)	58 (61.7%)	59 (62.8%)
Primary school (n=87)	64 (73.6%)	66 (75.9%)	63 (72.4%)
Secondary school (n=52)	47 (90.4%)	50 (96.2%)	48 (92.3%)
High school (n=21)	19 (90.5%)	18 (85.7%)	19 (90.5%)
Secondary specialized school (n=52)	44 (84.6%)	49 (94.2%)	46 (88.5%)
Junior college (n=31)	30 (96.8%)	29 (93.5%)	30 (96.8%)
University and above(19)	19 (100.0%)	19 (100.0%)	19 (100.0%)
Total (n=356)*	287 (80.6%)	289 (81.2%)	284 (79.8%)

* 14 interviewees didn’t indicate their education level.

Most interviewees in Lhasa (81%) said they would stop wearing and buying animal-skin trimmed clothing if there was strong public opinion against this practice. However, most interviewees in the neighbouring town of Nagchu (80%) said they would continue.

The consumer attitude surveys indicate that Tiger and Leopard skin clothing possession is uncommon, and not confined to any particular segment of Tibetan society. These skins are primarily valued as an indicator of prosperity, by people both rich and poor. Awareness that the trade was illegal and that Tigers were endangered was relatively high. While many people indicated a willingness to

stop using skin clothing, this varied strongly by survey location, with Lhasa residents much more willing than those in the neighbouring town of Nagchu.

Retail markets for Tiger and Leopard skin clothing

Two market surveys were carried out by TRAFFIC-sponsored researchers for this report. The first, in July 2005, surveyed 55 shops in Lhasa, Nagchu and Chamdo, and found 35% (n=19) openly selling Tiger skin products (**Figure 10**) and 53% (n=29) selling Leopard skin products. The second survey, a year later in July 2006, surveyed 44 shops, primarily in Lhasa and Shigatse. In 2006, Leopard skin products were only displayed openly at three shops (two in Shigatse and one in Lhasa) (**Figure 11**), and a second shop in Lhasa showed its stock of Leopard skin *chubas* on request. Although no Tiger skin products were seen in 2006, seven per cent of shops surveyed claimed to sell them. Twenty per cent claimed to sell Leopard skin *chubas* (**Tables 15 and 16**).

Table 15

Availability of Tiger skin products in Lhasa and other Tibetan towns, 2005 and 2006

Place	July 2005		July 2006		
	Number of shops surveyed	Number and percent of shops openly selling Tiger skin products	Number of shops surveyed	Number and percent of shops claiming to sell Tiger skin products	Number and percent of shops where Tiger skin were seen
Lhasa	31	7 (23%)	15	3 (20%)	0
Nagchu	13	6 (46%)			
Chamdo	11	4 (36%)			
Linzhi			3	0	0
Shigatse			26	0	0
Overall	55	19 (35%)	44	3 (7%)	0

Figure 10



Tiger skin *chuba* for sale in Nagchu, Tibet Autonomous Region during the July 2005 survey

Table 16

Availability of Leopard skin products in Lhasa and other Tibetan towns, 2005 and 2006

Place	July 2005		Number of shops surveyed	July 2006	
	Number of shops surveyed	Number and percent of shops openly selling Leopard skin products		Number and percent of shops claiming to sell Leopard skin products	Number and percent of shops where Leopard skin were seen
Lhasa	31	15 (48%)	15	7 (47%)	2 (13%)
Nagchu	13	10 (77%)			
Chamdo	11	4 (36%)			
Linzhi			3	0	0
Shigatse			26	2 (8%)	2 (8%)
Overall	55	29 (53%)	44	9 (20%)	4 (9%)

A third survey was carried out a month later, in August 2006, in Lhasa’s Barkhor district, by researchers from the WWF office in Lhasa (K. Norbu unpub. data). Although sample sizes differ, the latter surveys focused only on shops most likely to be selling expensive skin-trimmed *chubas*, while the initial survey covered a wider spectrum of shops to gain a general picture of the market.

Tables 17 and 18 compare results of the three surveys for Lhasa’s Barkhor Street market. The number of shops surveyed varied, but the percentages of shops displaying and claiming to stock big cat skin *chubas* did not vary much. However, the total number of Tiger skin *chubas* seen for sale fell significantly, from 10 in 2005 to two in 2006 (**Table 17**). While the decline in the number of big cat skin *chubas* seen is partly due to shopkeepers removing them from display, the number of shops showing or claiming to sell Tiger skin *chubas* also declined by more than half. A similar trend is evident for Leopard skin *chubas* (**Table 18**).

The average price for a Tiger skin *chuba* in July 2006 was CNY26,666

Figure 11



Leopard skin *chubas* photographed during Lhasa survey, July 2006

Credit: TRAFFIC

(USD3,307), and CNY10,813 (USD1,341) for a Leopard skin *chuba* (Table 19). Unlike prices for Tiger and Leopard bone, there was not much variation. The origin of most of the skins was said to be India. These are expensive items when weighed against average Tibetan monthly incomes (Table 13). Ownership of such expensive items by poorer households could reflect a strong demand for these items. However, it is not known when the surveyed households acquired their Asian big cat skin clothing, and how much they paid for it.

Table 17

Tiger skin chubas seen for sale in Lhasa's Barkhor Street market in 2005 and 2006

Survey date	Number of shops surveyed	Total number of shops selling Tiger skin <i>chubas</i>	Total number of Tiger skin <i>chubas</i> seen
July 2005	31	7 (22%)	10
July 2006*	14	3 (21%)	0
August 2006	10	2 (20%)	2

* these shops claimed to sell Tiger skin *chubas* but not verified

Table 18

Leopard skin chubas seen for sale in Lhasa's Barkhor Street market in 2005 and 2006

Survey date	Number of shops surveyed	Total number of shops selling Leopard skin <i>chubas</i>	Total number of Leopard skin <i>chubas</i> seen
July 2005	31	15 (48%)	28
July 2006*	14	6 (43%)	5
August 2006	10	6 (60%)	8

* includes shops claiming to sell Leopard skin *chubas* but not verified

Table 19

Prices (in CNY) for Tiger and Leopard skin chubas in July, 2006

Type of chuba	Average price (sample size)	Standard deviation	Price range
Tiger	26,666 (3)	5,773	25,000–30,000
Leopard	10,813 (8)	3,625	7,000–15,000

Photographs of Tibetans wearing Tiger and Leopard skin *chubas* at festivals published by the Environmental Investigation Agency and the Wildlife Protection Society of India (Anon., 2005d, Banks *et al.*, 2006) galvanized global attention to the Tibetan market. However, their findings do not disagree with our consumer attitude survey, which indicates that these items are owned by a small minority of Tibetans. For example, Banks *et al.* (2006) estimated that there were over 50 Tiger skin *chubas* and over 200 Leopard skin *chubas* at four Tibetan festivals they attended in August 2005. However, the age of the clothing and the number of people with such clothing attending more than one festival are unknown. Moreover, only a small percentage of festival attendees were wearing Asian big cat skin clothing.

From 2005 to 2006, TRAFFIC surveys documented a decline in the number of Tiger and Leopard skin *chubas* displayed for sale in Lhasa's main market in Barkhor Street (**Tables 17 and 18**). These results were replicated by Banks *et al.* (2006). They saw one Tiger skin and three Leopard skin *chubas* in the Barkhor market in July 2006, compared to 23 Tiger skin and 54 Leopard skin *chubas* in August 2005.

TRAFFIC surveys and Banks *et al.* (2006) all found that dealers reported a major shift in consumption patterns and decline in trade volume. Whereas most consumers in 2005 were reported to be Tibetans buying clothing or skins for clothing trim, in 2006 shopkeepers reported that few Tibetans were then buying. Prices for Tiger and Leopard skins reportedly fell from 2005 to 2006 (Banks *et al.*, 2006; Wildlife Trust of India, 2006). Banks *et al.*, (2006) also found that the number of people wearing Tiger and Leopard skin clothing at Tibetan festivals declined significantly between 2005 and 2006. Importantly, a major decline was seen at the Nagchu festival ("roughly 50%": Banks *et al.*, 2006), where people had previously informed Tsering (2006) that they did not want to give up their use of animal skin clothing, even if the species were endangered.

This apparent decline use and trade is believed to have resulted primarily from public awareness campaigns launched in early 2006 by environmental and religious organizations, as well as the State Forest Administration, asking Tibetans to give up endangered wildlife clothing (Anon., 2006d; Banks *et al.*, 2006; Jackson, 2006). This shows that public education can have strong impacts on consumption of endangered species. Still, the market surveys show that some illegal trade continues, and Tibet continues to be a consuming market as well as a transit point. In October 2006, a reporter interviewed a trader of Asian big cat skins who was smuggling them from Lhasa into eastern China on the newly opened railway (Simpson, 2006). While there is evident progress, the big cat skin trade in Tibet still poses a serious threat.

Tiger tonics: Tiger bone wine

The tradition of brewing medicinal wines in China dates from the Han dynasty. Many medicinal wines are formulated to treat rheumatism, and Tiger bone wine is among the most famous. Many consider medicinal wine particularly effective because it is easy to consume on a daily basis for a chronic condition, and the alcohol is said to have a warming effect (Flaws, 1997). Tiger bone wine was a popular form of Tiger medicine, and in the past wine manufacturers consumed large quantities of Tiger bone. Beijing Tong Ren Tang, one of the oldest pharmaceutical companies in China, was probably the largest manufacturer. According to its company representative, before the 1993 ban,

Tong Ren Tang used 2–3,000 kg of Tiger bone annually for production of Tiger medicines, primarily wine, and supplied up to 80% of the domestic market. If the 1993 trade ban is lifted, the company anticipates using 1,000 kg of Tiger bone per year (Jenkins, 2006).

Tiger bone is no longer officially recognized as a medicine since it was removed from the government list of approved pharmaceutical ingredients in 1993. In its general reputation, Tiger bone wine is purported to have medicinal qualities, but is considered more of a health tonic than a medicine (Appendix 1). In our survey of 663 medicinal outlets (523 retail shops plus 140 wholesale shops), only one shop was found selling Tiger bone wine. The label indicated that it was manufactured before the 1993 ban, from a wild Tiger that had been found dead (**Figure 6**). However, other supply routes are used, such as gift shops (see below) and the internet. A TRAFFIC survey (Wu, 2006) documented seventeen instances of Tiger bone wine for sale on Chinese auction websites, for example, with one seller offering a lot of 5,000 bottles.

While the illegal Tiger bone medicine market and Tiger skin market appear to be supplied primarily by wild Tigers, illegal trade in Tiger bone wine may well be supplied primarily from captive Tigers in China. In October 2005, the Badaling Safari Park outside Beijing had a poster in its restaurant advertising tiger bone wine made from captive animals (C. Liou, pers. comm., 2006) (**Figure 12**). In February 2006, a wildlife park in Shanghai was under investigation for selling Tiger bone wine at USD33 per bottle (Anon., 2006e). In January 2007, a journalist reported Tiger bone wine for sale at the gift shop of the Tiger breeding centre in Heilongjiang (Cheng, 2007). The Guilin-based Xionsen Bear and Tiger Mountain Village has gone the furthest, establishing a subsidiary wine-producing facility, the Xionsen Wine Producing Ltd. Co., in 2004.

This section of TRAFFIC's report uses the Xionsen Wine Producing Ltd. Co. as a case study for this emerging trend. According to the company's website <www.glsyjl.com>, viewed in September 2006, the wines contain the bones of captive-bred animals which have died at the breeding centre. The website says that demand for Tiger bone pushed the species to the brink of extinction and resulted in its listing as a Class I protected species in China.

In 2005, the company received permission from the State Forestry Administration and the State Administration for Industry and Commerce to produce 400,000 bottles of “Bu Gu Jiu”—“Bone Strengthening Wine” (**Figure 13**). The name sounds like Tiger Bone Wine—“Hu Gu Jiu”—and the bottle is made as a replica of a Tiger (**Figures 14 and 15**). The Xionsen wine company's website touts its aphrodisiac qualities in addition to rheumatic curative potential. Although the name and package are suggestive of Tigers, the approved wildlife ingredient is African Lion *Panthera leo* bone.* Xionsen Bear and Tiger Mountain Village claimed to have over 200 African Lions in

* The conservation community does not recommend that any other felid species be used as an alternative to Tiger bone; rather, the emphasis has been on eliminating demand. Allowing the use of Lion as a substitute for Tiger is a dangerous precedent. The African conservation community is concerned about the potential for Lion bone to serve as a substitute for Tiger bone, a concern reflected in two regional Lion conservation strategies developed by the African range State governments in partnership with conservationists and stakeholders (Cat SG 2006a,b).

Figure 12



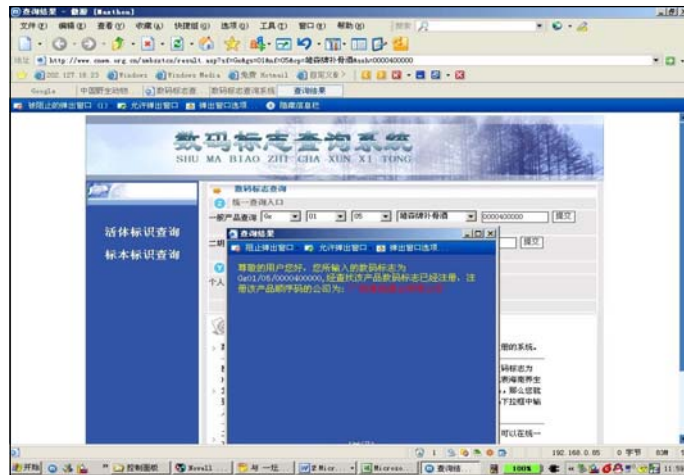
Credit: Caroline Liou, TRAFFIC

This poster advertising Bei Da Cang Tiger bone medicinal wine was photographed at the Badaling Safari World outside Beijing in October 2005. The poster claims that the wine is made from captive Tigers that have died from fight wounds, and that income from the wine will go toward wildlife conservation. The wine appears to be illegal because Chinese law prohibits trade in and use of Tiger parts and products, but Tiger breeders in China are at the forefront of a group of advocates calling for a domestic market in captive-bred Tiger bone medicines to be legalized. The Government of China is currently reviewing its domestic Tiger trade policy, and this report aims to assist by presenting evidence that China's Tiger bone trade ban has been successful, and policy change would be detrimental to conservation of the world's wild Tigers.

2006 (Anon., 2006c, Anon., 2006i), although only a few Lions were seen by visitors to the facility (Anon., 2006i; K. Conrad pers. comm., 2006) (**Figure 16**).

Despite Lion being the approved ingredient, the BuGu Wine packaging seen during TRAFFIC surveys does not contain the word “Lion” in either Chinese or English. Consumers are led to believe that BuGu Wine is actually Tiger bone wine, given that the name is homonymous, the bottle is a Tiger replica, and that only experts know that *Panthera leo* refers to African Lion.

Figure 13



Credit: TRAFFIC

Xionsen wine company authorized by the Bureau of Industry and Commerce and State Forestry Administration to manufacture 400,000 bottles of BuGu Wine

A large display at the Xionsen Wine Producing company facility reinforces the perception that BuGu Wine is made from captive Tigers from the Xionsen Bear and Tiger Mountain Village (**Figure 17**).

Each bottle has a unique serial number with the protected species ingredient (*Panthera leo*) under China’s newly developed wildlife product labelling system (Wang, 2006) (**Figure 18**). BuGu Wine has been reported for sale at a number of outlets throughout China, but not yet in Beijing. These outlets are not Chinese pharmacies, but rather gift shops in cities and airports (Zhang, 2006 and a Shenzhen supermarket website viewed in September, 2006: <http://www.edeng.cn/data/china/shenzhen/business/supermarket/392275.html>). The wine is also for sale at the Xionsen Tiger breeding centre, as seen by TRAFFIC (Anon., 2006i).

The wine is reportedly produced by steeping carcasses in large vats of rice wine (Li and Jiang, 2006; Zhang, 2006). The carcass shown in **Figure 19** is likely a big cat, based on the teeth that are visible, but it is not possible to determine whether it is a Lion or a Tiger (B. Yates, US Fish and Wildlife Service Wildlife Forensics Laboratory, pers. comm., 2006). Two separate investigations by Beijing-based news reporters documented staff at the wine company and its distributors claiming that the carcasses in the vats were actually Tiger and that the wine was Tiger bone wine (Li and Jiang, 2006; Zhang, 2006). Guides at the Bear and Tiger Mountain Village also told a TRAFFIC investigator that BuGu Wine was made from Tiger bone (Anon., 2006i).

Figure 14



Credit: TRAFFIC

Poster for BuGu Wine at the Bear and Tiger Mountain Village breeding centre in Guilin

Figure 15



Credit: TRAFFIC

Bottle of BuGu Wine

Figure 16



Credit: TRAFFIC

Lions at the Xionsen Bear and Tiger Mountain Village

In October 2006, China's governmental delegation to the 54th meeting of the CITES Standing Committee distributed a statement which referred specifically to one of these news articles. The statement said that "a law enforcement investigation was made immediately and the report arrived at the top wildlife authority of China on August 29, advising that only 16 legally obtained Lion carcasses were found, and no Tiger bone was used to produce the wine" (Govt of China, 2006a). The statement went on to say that any Tiger connection to the wine was a kind of advertising, like the popular Tiger Beer brand made in Thailand.

Two bottles of BuGu Wine were purchased by TRAFFIC from the Bear and Tiger Mountain Village. These were of two types: wine in which the carcass was claimed to have steeped for three years, and wine in which the carcass was claimed to have steeped for six years. This seems contradictory to permission to manufacture the wine having been given only in 2005. However, illegal production and sale of Tiger bone wine from Xiongshen's facility has been reported since the late 1990s (Southworth, 1999; Nowell, 2000). The price of three-year BuGu Wine was CNY450 (USD56) and for six-year BuGu Wine CNY950 (USD118) (Anon., 2006i).

The manufacture of wine labelled as containing Lion bone but being marketed as implicitly containing Tiger bone poses serious implications for violations of not only Chinese national law, but also international law. The Lion is listed in Appendix II of CITES, which permits international commercial trade with an export permit. A check of the WCMC-CITES trade database (September, 2006) shows that China has not yet reported any exports of Lion bone wine. Sale of Lion bone wine could be legal, in a technical sense, although discouraged by the African Lion conservation community. If, however, government-approved Lion bone wine is actually made with Tiger bone, this would appear to be a significant legal violation.

Figure 17



BuGu Wine display at the Xiongshen Wine Producing Company gives the impression that the wine is made from captive Tigers from the Tiger and Bear Mountain Village

Figure 18



Government approval label for African lion Panthera leo on the BuGu Wine packaging box

Figure 19



Credit: TRAFFIC

Carcass steeping in vat at the Xionsen Wine Producing Company to make BuGu Wine (front leg and teeth visible)

The two bottles of BuGu Wine purchased by TRAFFIC were sent to the Kunming Institute of Zoology, Chinese Academy of Sciences, for forensics testing. Although DNA was detected, it was too degraded to be amplified and matched to any felid-specific DNA sequence (Kunming Institute of Zoology, 2006). The failure of sophisticated laboratory analysis to confirm the species used to make the wine compromises the government's ability to police its wildlife product manufacturing policy. If the use of approved species cannot be verified, the system is open to abuse. DNA testing should be done of the actual carcasses in the wine vats.

Persistent claims by staff and distributors that BuGu Jiu is made from Tiger bone, the packaging in a Tiger-shaped bottle, and the lack of an explanation that *Panthera leo* is actually African Lion could be interpreted as a violation of Chinese law prohibiting labelling of any substance as containing Tiger parts. The Xionsen BuGu Wine marketing perpetuates consumer demand for Tiger bone wine, subverting established Chinese policy of eliminating demand. The use of African Lion as a substitute for Tiger bone wine should not be permitted due to concerns that demand could be stimulated which would impact wild Lion populations.

LITERATURE REVIEW: RESULTS AND DISCUSSION

Dining on Tiger: Tiger meat

In recent years in China there have been a number of reports of Tiger meat sale and consumption. In 2004, two farmers from Heilongjiang province were given prison sentences of nine years each. They had caught a wild Tiger accidentally in a trap, left it to die, and went back six days later for the meat. They said that they knew killing the Tiger was illegal, but thought that eating the meat was not (Anon., 2004a).

This was an unusual case of a wild Tiger being used for meat. But due to the rarity of wild Tigers in China and the difficulty of smuggling wild Tiger meat into the country, Tiger meat sold in restaurants in China is likely to be derived from captive animals. For example, the best known case of Tiger meat in China is probably Hufalou restaurant near the Hengdao River Breeding Centre. It had a large Tiger entrance portal (**Figure 20**) and Tiger meat available on the menu in 2005. A group of reporters ordered the dish (800CNY, or USD99), and asked the hostess, “How come your restaurant can get real Tiger meat, but others can’t? How do we know that your Tiger meat is real?” According to their report, she replied, “Of course, we have connections. Our boss has good connections with the director of the Tiger farm. The director will only supply us.” (Anon., 2005e).

Shortly after the news story was published, the restaurant was raided by government authorities. The owner claimed that the meat was actually donkey dressed in Tiger urine. It was unclear where the Tiger urine was obtained, but the Director of the Hengdao River Tiger breeding centre, from where the meat reportedly originated, told reporters, “It is impossible for the meat of dead Tigers from the park to be smuggled outside. We have specialist workers to remove the hide and detach the meat from the bone. Some useful organs are preserved for research while the remaining meat is incinerated and buried; the fur and bones are stored in a refrigerator.” (Anon., 2005f).

The June 2006 foreign delegation that visited China at the invitation of the government, regarding the petition to allow trade in captive-bred Tiger parts, was shown Tiger carcasses in the freezers at both the Hengdao River and Bear-Tiger Mountain breeding centres. The freezers contained Tiger

bones frozen in heavy-duty plastic bags, apparently one skeleton per bag. According to one delegate’s report, “It was not clear what control mechanisms apply to pelts and soft body parts that require different storage methods” (Jenkins, 2006).

It is possible to use DNA forensic analysis to determine if what is being marketed as Tiger meat is genuine. For example, species-

Figure 20



Entrance to the Hufalou restaurant, near the Hengdao River Tiger breeding centre in Heilongjiang

Source: Anon. (2005e)

specific primers for Tiger DNA were developed by the Key Laboratory of Conservation Genetics and Reproductive Biology for Endangered Wild Animals in Zhejiang, brought in by authorities to help investigate a case in November 2001. Authorities received a citizen's tip that a circus in Ningbo city was selling meat, bones and other parts from Tigers. When they investigated, one buyer was detained and meat, which the buyer said was beef, was confiscated. The forensics analysis identified the meat as genuine Tiger (Wan and Fang, 2003). Even if what

is advertised as Tiger meat is not, it still encourages demand and violates Chinese law. A restaurant in Chongqing recently set up a large poster advertising "Tiger" meat (**Figure 21**). When a reporter telephoned to ask questions, the owner quickly said it was cat meat, advertised as Tiger as a publicity stunt. According to the news report, the owner was arrested by the Yuzhong business bureau for "acts of unfair competition, false advertising, and misleading consumers." The article points out that the restaurant violated wildlife policies prohibiting labelling of products as Tiger (Yang, 2005).

In Beijing, Tiger penis was recently reported on the menu at the Guolizhang restaurant, which specializes in penis dishes (Harding, 2006). The waitress claimed the dish was made from animals that had died of "natural causes," and that they had one or two orders a year for it; the cost was USD5,700. Whether Tiger meat dishes and Tiger wines are genuine or not, or derived from wild or captive animals, they serve to encourage demand for Tiger tonics as luxury items.

Figure 21



Source: Yang (2005)

"Tiger" meat advertised at a Chongqing restaurant

TIGER SMUGGLING: A REVIEW OF SEIZURES

A notification issued jointly by the State Forestry, Customs and Police Administrations in 2003 requires that any wildlife seizure of an international nature be reported to the office of the CITES Management Authority (Govt of China, 2007). According to a statement made by the China CITES Management Authority at the 53rd meeting of the CITES Standing Committee, information from the national seizures database has been provided to CITES and other Parties (CITES, 2005).

Table 20

Seizures of Asian big cats in China, 1999–2005 (Govt of China, 2006b)

Asian big cat	Skins	Tiger/Leopard bone (kg)	Bones (skeletons)
Tiger	80		31
Leopard	744		6
Snow Leopard	19		1
Totals	843	334.6	38

Table 20 shows Asian big cat seizures in China from 1999 to 2005, from a report published on the website of the China CITES Management Authority (Govt of China, 2006b). Some of the skin seizures have been very large. On 9 October, 2003, the Customs Service of the Tibet Autonomous Region seized a cargo of 1,392 animal pelts in Sangsang, near the Purang Pass on the China-Nepal border. The haul included 31 Tiger skins and 581 Leopard skins (Tsering, 2006: **Figure 22**).

Both market surveys (see section on Tiger skins) and the seizure information show that Snow Leopard skins are uncommon compared to Tiger and Leopard, despite the Snow Leopard being the more plentiful species in the wild in the Tibetan region. This could be because the new trend of wearing Asian big cat skin clothing in Tibet may have originated in the southern Kham regions where Tiger and Leopard are found but not Snow Leopard.

According to the Government of China (2006b), the sources of the seized big cat products are:

China: 11 cases;
Burma: 15 cases;
Russia: 8 cases;
Mongolia: 5 cases;
Nepal: 3 cases;
Kenya: 2 cases;
Nigeria, North Korea, Kirghizia: 1 case, respectively
Unsure: 4 cases

It is notable that none of the seizures listed on the website of the China CITES Management Authority were reported to have originated in India. Yet China is considered to be the destination of Asian big cat seizures in India and Nepal. This is especially true for skins, where a market sprang up in

Tibet over the seizure-report period. India and Nepal are not traditional consumers of Tiger bone, so the bone seized in these countries was probably destined for China.

Figure 23 shows seizures of Tiger and Leopard skins from China, India and Nepal from 1999 to 2005. China has seized a greater number of skins than the other two countries. Although the website of the China CITES Management Authority does not report any of their seizures as having originated in India, it is nonetheless likely that many of China's skins come from India, insofar as many of the skins seized in India (as well as Nepal) appear to have been destined for China. Further, the seizures by China that originated from Nepal may well have originated in India. The number of Leopard skins seized greatly outnumbers Tiger skins in all three countries.

Figure 22



China's largest single confiscation of big cat skins, seized at the Purang Pass on the border with Nepal in 2003

Table 21

Seizures of Tiger and Leopard bones in China, India and Nepal, 1999–2005

Country	Tiger/Leopard bone (kg)	Tiger skeletons	Tiger bone (sacks)	Tiger/Leopard bone (pieces)
China	335	31		
India	175	4		
Nepal	118		5	103
Totals	628	35	5	103

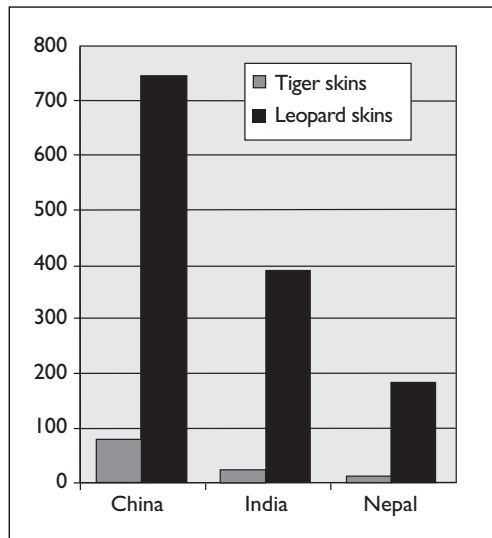
Sources: China: Govt of China (2006b); India and Nepal: (Banks *et al.*, 2006)

Table 21 lists seizures of Tiger and Leopard bone for the three countries over the same period. A significant quantity of bones has been seized, demonstrating that demand persists. India and Nepal are not traditional consumers of Tiger or Leopard bone, so as with skins, it is likely that these products were destined for China. Yet comparing **Table 20** with **Table 21**, it appears that in all three countries more skins have been seized relative to bones. (This comparison assumes that one skin represents one Tiger, while approximately 10 kg of bones represents one Tiger; see, for example, the estimates reported by Chinese medicine industry representatives in Jenkins (2006) and reviewed in the Introduction) This suggests that the market for Asian big cat skins may have grown larger than the market for bones. However, bones can be more difficult to detect than skins, and may thus more easily evade law enforcement detection.

A review of news reports (Box 1) shows that most of the seizures have taken place in China's border regions, particularly along the borders with Myanmar, Nepal and Russia. This highlights the importance of international co-operation to stop cross-border trade, and in recent years China

Figure 23

Tiger and Leopard skin seizures in China, India and Nepal, 1999–2005



has hosted a number of law enforcement meetings with other range States (Govt of China, 2007).

The high number of Asian big cat seizures in China shows strong law enforcement effort. China has strict penalties for illegal hunting and trade in protected species (Govt of China 1988, Govt of China, 2007), and lawbreakers have been executed or given long prison sentences, including life imprisonment (Mainka, 1997; Anon, 2004b; Anon, 2006f). Still, the seizures reveal a troubling level of illegal trade, primarily in products originating in other countries. Our surveys indicate that the primary markets for bone and skins are declining, which could suggest decreasing demand. High levels of seizures, on the other hand, might lead to the conclusion that demand is unabated. In part, the high seizure

levels reflect strong demand in Tibet for skins that has only recently shown signs of decline. But there have also been cases of large-scale trading in bones: for example, one man was sentenced to life imprisonment for selling, over several years, over 20 Tiger skeletons (Anon. 2006f).

Review of news reports about seizure cases (Box 1) yields numerous examples of people who do not seem to be regularly engaged in this type of business and do not have a sophisticated understanding of price or marketing methods. This could apply even to the larger volume seizures. This type of trader might be exemplified by the Taiwan-based trader who was caught in 2005 with 140 kg of Tiger bone from Sumatra (Anon., 2005g). After the high profile seizure, TRAFFIC's office in Taipei held a meeting with major Chinese medicine dealers, who believed that this trader was new to the business (with less than three years experience), and did not grasp the seriousness of the Tiger bone trade ban (Joyce Wu, pers. comm., 2006). However, some of the skin seizures, and prosecutions in Nepal and India, point to longstanding, highly organized smuggling operations (Banks *et al.*, 2006).

Both types of illegal traders are involved—professional networks as well as opportunistic amateurs attracted by potential high profits. The existence of professional networks implies organized demand, and it is likely that if the Tibet skin market continues to decline then this type of trade will also decline. The existence of opportunistic amateurs does not necessarily imply continued demand, but could reflect people who are hoping to make money but do not necessarily have a buyer lined up in advance, in a country with increasing consumer buying power on the one hand, and mobility on the other.

TRAFFIC surveys show little evidence of an illegal market for Tiger bone medicines, and that illegal skin trade is declining. These results suggest a reduced demand for these products and a reduced pressure on wild populations. However, seizures show some level of continuing demand in China. This demand could easily grow again, and that growth could be rapid.

According to the *1988 Wildlife Protection Law*, carcasses of Specially Protected Animals (or species listed in Category 1, which include the Tiger) should be disposed of by national authorities, whether wild or captive-bred in origin. Yet the Government of China has been sealing and stockpiling seized Tiger products, including bones and skins (CITES, 2005), despite the recommendation of CITES Resolution Conf. 12.5 that stockpiles of Asian big cat products be destroyed. China's government has also allowed the Tiger breeding centres to keep Tiger bones and other parts in their freezers, rather than having them disposed of by national authorities (Jenkins, 2006). In an article reviewing a court case where officials stole 12.95 kg of bones from a government stockpile originally seized in 1994, Zhao (2004) points out that preserving secure stockpiles requires considerable expense. Zhao describes the conflict within China between parties who feel that these stocks should be sold to generate money, and those who call for their destruction to aid the process of eliminating the domestic market for Tiger products.

Box 1

Chinese news reports and other sources of information about Asian big cat seizure cases

Anon. (1999c), Anon. (2004b), Anon. (2005h), Anon. (2006f), Anon. (2006h), Cao (2004), Ding and Lei (2006), GaMa and Zhang (2004), Gao and Yang (2001), Gao *et al.* (1999), Ji and Wang (2001), Jian and Zhou (2002), Mao (2006), Qian and Ma (2004), Theile (2003), Wang (2000), Wu and Li (2002), Yang (2003), YFB (2006), Zhao *et al.* (2005)

TIGER POLICY: USING TRAFFIC SURVEYS AND OTHER SCIENTIFIC RESEARCH TO EXAMINE THE ARGUMENTS FOR LEGALIZING DOMESTIC TRADE IN CAPTIVE-BRED TIGER MEDICINES

To protect Tigers in the wild, and in harmony with action of all other Tiger range States and the recommendations of CITES, China's longstanding policy has been to ban domestic trade in all Tiger products (including products labelled as Tiger). As discussed earlier in this report (in the Introduction), the Government of China has been petitioned to change this policy to allow domestic trade in medicines made from captive-bred Tigers. China's January 2007 report to CITES summarizes the arguments made by policy change proponents, who claim that current policy has failed to conserve Tigers and protect public health (Govt. of China, 2007). The Tiger breeding centres also say that they need to sell Tiger products in order to cover the costs of breeding Tigers for reintroduction (Cui, 2003; CCTV, 2003; Luo, 2005; Anon., 2006c). In the section below, we examine arguments for policy change in China in light of our survey results and a review of published scientific literature.

Have national and international trade bans failed to conserve Tigers?

The primary argument made by legalization proponents is that present policies have failed to protect wild Tigers (Govt of China, 2007). Indeed, global Tiger numbers (Bindra, 2006) and range (Sanderson *et al.*, 2006) are now thought to be lower than previous recent estimates. But the difference between present and previous estimates must be interpreted with caution. While losses of Tigers and their habitat did occur, the new lower estimates also reflect a better state of knowledge and improved methodologies (Karanth *et al.*, 2003; Sanderson *et al.*, 2006), after decades of intensive investment in conservation and research. In other words, previous estimates may have over-estimated Tiger numbers and range.

The best source of current information on Tiger status is the Tiger Conservation Landscape database, a comprehensive and scientific global assessment which mapped and categorized wild Tiger populations (Sanderson *et al.*, 2006). It found that 77% of current Tiger range consists of "known and secured breeding population[s] of Tigers in areas large enough for a substantive population." Although the Tiger remains an endangered species (Cat Specialist Group, 2002), it is being successfully conserved in the majority of its present range. This scenario is a far better outcome than many Tiger specialists feared in the early 1990s, when the Tiger became a focal species of international alarm over poaching for Tiger medicines.

To what extent have international and national trade prohibitions contributed to Tiger conservation? During the 1990s, China's medicine market was widely judged to be the leading threat to wild Tigers (Mills and Jackson, 1994; Nowell, 2000). During that time, the world's first global Tiger status assessment found that most Tiger populations (113 out of 127 populations where there was sufficient information for assessment, or 89% of Tiger populations) were threatened by medium to high poaching pressure (Dinerstein *et al.*, 1997).

But the recent Tiger Conservation Landscape re-assessment suggests that commercial poaching pressure on Tigers has since declined. **Table 22** shows the threats to Tiger populations identified by 77 biologists who work with these populations (Sanderson *et al.*, 2006). Threats are ranked according to their severity, urgency and prevalence. One type of Tiger poaching scores as the fourth highest threat, but it is incidental hunting, meaning when Tigers are caught accidentally by hunters targeting other species. International trade in Tiger parts scored seventh out of a total of 15 threats. While the leading threat, lack of law enforcement, contains an element of commercial poaching, Tiger poaching does not stand out as the primary threat it was considered to be in the past. Poaching of Tiger prey is considered a more significant problem for most Tiger populations than directed hunting of Tigers.

These global Tiger status and threat assessments indicate that international trade bans have helped conserve wild Tigers. National trade bans appear to be even more effective, as “Local Trade in Tiger Parts” scores relatively low as a threat to Tiger populations (**Table 22**). While illegal trade does remain a significant threat, especially for Tiger populations depleted by other factors, it appears to have declined in severity over the past decade.

TRAFFIC surveys in China since the ban have consistently found greatly reduced availability of Tiger medicines in comparison to before the ban, when some 200 brands of Tiger medicine were being manufactured. While surveys have also consistently documented illegal domestic trade, the level has greatly declined over the period since the ban took effect. This evidence also points to a

Table 22

Threats to Tiger populations (in order of severity)

Threat	Vulnerability score*
Lack of enforcement	1942.8
Hunting of Tiger prey	1936.1
Low Tiger population size	1909.1
Incidental hunting of Tigers	1544.8
Lack of connectivity	1510.0
Habitat degradation	1499.3
Export of Tiger parts to other areas	1461.9
Habitat destruction	1385.7
Directed hunting of Tigers	1325.2
Resource exploitation	1229.0
Local trade in Tiger parts	1029.7
Lack of legal protection	585.7
Civil unrest	188.7
Competition from other carnivores	176.4
Disease	21.7

* A high Vulnerability Score indicates that the threat is severe (e.g., it is reducing Tiger populations), it is urgent and it is affecting a large number of Tiger Conservation Landscapes across the entire range

Source: Sanderson *et al.*, (2006)

positive contribution to Tiger conservation. If China's market for Tiger medicines is no longer the leading threat to wild Tigers living either within or outside China, then China's ban on Tiger bone medicine has helped Tiger conservation. China should be congratulated for this.

TRAFFIC surveys suggest a greatly reduced market for Tiger medicines in China. However, if trade is re-opened, the market could increase sharply. China has a much stronger economy compared to when the trade ban was instituted in 1993. A resurgent market in China would likely result in an increased threat to wild Tiger populations, reversing the gains made in reducing this threat over the past decade.

Would a legal supply of captive-bred Tiger medicines replace illegal supplies?

Even if the current Chinese market for Tiger medicines is no longer the leading threat, it is still one of the many significant threats to wild Tiger populations. A source of supply from captive-bred Tigers could theoretically replace wild supplies and further alleviate this threat (Govt of China, 2007). Would wild Tigers continue to be poached if an alternative supply of Tiger parts were available?

The answer is almost certainly yes. For many years an alternative source of supply to wild Tigers already has been available in China, yet wild Tigers have continued to be poached and sold for Chinese medicine. That alternative source of supply has been fake Tiger products. Genuine Tiger bone can only be verified visually by careful analysis, and voluminous published scientific literature on how to do so is testimony to the prevalence of fakes in the Tiger medicine market and the difficulty of discriminating them (Ding, 1983; Ding, 1985; Chen, 1990; Chen, 1991; Song, 1991; Lin and Chen, 1988; Yates, 2000).

It is possible that these seemingly genuine fakes have satisfied some Chinese market demand that would otherwise have been directed at wild Tigers. But clearly the market for wild Tiger products has continued, as shown by surveys by TRAFFIC and other environmental groups, as well as seizures made by China and other government law authorities. An abundant alternative source of supply has not replaced supplies from wild Tigers. With wild Tiger populations so endangered, it is simply too risky to do anything that might enlarge markets for Tiger products and thus potentially increase poaching offtake of wild Tigers.

This concern has been echoed by a CITES Standing Committee study of the relationship between *ex situ* production and *in situ* conservation (CITES, 2006): "For highly desirable species with high market value, the existence of a legitimate source of *ex situ* specimens can act as an incentive for illegal trade (through laundering of wild-caught specimens)...Under Resolution Conf. 12.5, trade in Tiger parts and derivatives even from captive-bred specimens is discouraged, [demonstrating] the concern that this risk can outweigh any conservation benefits."

Even if medicines made legally from captive-bred Tigers were able to be clearly distinguished from illegal wild Tiger parts and products, it is likely that demand for wild Tiger medicines would persist, due to potential consumer preference for wild Tigers as more powerful and potent.

Are Tiger medicines essential for public health in China?

Although Tiger bone is not widely recognized as having medicinal value outside the Asian medicine disciplines, many people in China do consider it effective. Legalization proponents argue that human suffering could be alleviated by putting Tiger bone back in the national list of approved pharmaceutical ingredients (*Medica Sinica*) and producing medicines made from captive-bred Tigers (Govt of China, 2006a and 2007).

Negative impacts on public health from the loss of Tiger bone medicines would indeed be cause to consider this. However, the Chinese Government has invested significantly in research into alternatives to Tiger bone. For example, research into substitutes for endangered species medicines was included in The Action Plan of China's 21st Agenda (Meng and Zhai, 2000). Numerous scientific studies, published in Chinese peer-reviewed journals, have documented that the bones of other common species—including pig, dog, cow and mole rat—can replicate the effects of Tiger bone (**Table 23**).

Table 23

Methodologies and findings by Chinese research into Tiger bone substitutes

Primary finding about Tiger bone substitutes	Studies	Methodologies	Studies
Equivalent anti-inflammatory effect	1,2, 3, 4, 9	Ultra-violet analysis	7
Equivalent levels of inorganic compounds	2	Cluster analysis	6, 14
Equivalent capillary vessel permeability effect	1, 9	Infra-red analysis	8
Equivalent amino acid profiles	3, 5, 9, 13, 14	Pharmacodynamic comparison	3
Equivalent pain-relieving effects	3, 9	Laboratory animal tests	1, 2, 4, 9
Equivalent or higher levels of trace mineral elements	6, 9, 11, 12, 14	Chemical analysis	5
Equivalent glycine levels	5	Atom absorption spectrometer (AAS), hydride generation atomic fluorescence spectrometry (HAAS) and catalytic wave oscillograph	12
Can be replicated by laboratory protein synthesis	13	Multicentre randomized double-blind controlled trial in humans	13
Equivalent bone mineral density enhancement effects	13	Dual energy X-ray absorptionometry (DEXA)	13
Substitutes have lower essential and sulphur-bearing amino acids	10a	Blood tests for calcium levels alkali phosphatase activity	13
Substitutes have lower iso-electric properties	10b	Correlative analysis	14

Studies: 1. Wang *et al.*, 1974; 2. Wang *et al.*, 1975; 3. Anon. 1976a; 4. Anon. 1976b; 5. Sung *et al.*, 1995; 6. Mao *et al.*, 1995; 7. Liu *et al.*, 1995a; 8. Liu *et al.*, 1995b; 9. Zhang 1996; 10a. Yang *et al.*, 1993a; 10b. Yang *et al.*, 1993b. 11. Sun and Li 2002; 12. Suo *et al.*, 2004; 13. Zhang *et al.*, 2005; 14. Zhou *et al.*, 2006.

Several Chinese medicines are being manufactured based on this research. In 1995, Beijing Tong Ren Tang Medicinal Wine Factory was given government authorization to produce “Sailong Anti-Rheumatic Wine” as a substitute for Tiger bone wine (Chu and But, 1997). Another company has synthesized the amino acid profile of Tiger bone in its laboratories and has received government authorization to manufacture and sell Jin Tiang Ge capsules containing this artificial Tiger bone (Anon., 2003b; company website: <www.ginwa.com>), which were shown in a double-blind controlled trial to have the same efficacy on primary osteoporosis as real Tiger bone pills and capsules (Zhang *et al.*, 2005).

Literature review for the present report was only able to find two scientific papers, by the same author and published on consecutive pages in the same journal, suggesting that Tiger bone differs significantly in its properties from other animals (Yang *et al.*, 1993a,b). This early work appears to have been superseded by numerous studies with more advanced methodologies demonstrating that Tiger bone properties can be replicated by other mammal bones (Sun and Li, 2002; Suo *et al.*, 2004; Zhang *et al.*, 2005; Guo *et al.*, 2006; Liu and Han, 2006; Zhou *et al.*, 2006).

The availability of alternatives that have been proven effective by scientific methods, received government approval, and have no potential harmful impacts on wild Tigers shows that Tiger bone medicines are not essential for public health. Many leading practitioners have also said that they do not consider Tiger bone a necessary component of Chinese medicine (CATT, 2006). In Taiwan, 78% of doctors surveyed in 1999 said that Tiger bone substitutes were acceptable for them to use (Nowell, 2000).

Are large captive Tiger populations important for Tiger conservation in China?

The Tiger breeding centres have argued that large captive Tiger populations are necessary for reintroduction and are an important component of Tiger conservation in China. In order to cover the costs, they want to sell Tiger products (Cui, 2003; CCTV, 2003; Luo, 2005; Anon., 2006c). But how important is the breeding of large numbers of Tigers for conservation in China?

China lost most of its wild Tigers over recent decades. Reintroduction of captive-bred Tigers into areas where wild Tigers have become extinct is an important element of China’s national Tiger conservation policy. Reintroduction is a laudable goal, when it is feasible, but there is no record of success with this in Tiger conservation. It has never been seriously attempted or successfully accomplished, and a review of scientific literature fails to find any advocates for it among specialists with extensive experience in wild Tiger conservation (Nowell and Jackson, 1996; Dinerstein *et al.*, 1997; Seidensticker *et al.*, 1999; Tilson *et al.*, 2000; Ginsberg, 2001; Zhang *et al.*, 2005; Breitenmoser *et al.*, 2006; Gratwicke *et al.*, 2006; Sanderson *et al.*, 2006).

Cat specialists realize the reintroduction of captive-bred big cats is fraught with potential dangers. Captive-raised big cats are unlikely to be able to hunt and reproduce in the wild. More importantly, situations are rare in which the conditions that led to the original extinction—which include habitat degradation as well as hunting pressure on Tigers and their prey—have been alleviated. Little

viable habitat remains for reintroduction in China—much of the potential habitat shown in **Figure 1** is depleted of wild prey and contains extensive areas of unsuitable non-native plantation forest. Captive Tigers in China have no experience with hunting of wild prey. They also are dependent on and accustomed to humans, and would likely come into immediate conflict with human populations if they were ever introduced into a wild situation. If reintroduction is ever tried, the initial releases must necessarily be small. With 4,000 captive Tigers, China now has far more candidate animals than would be required. The gene pool of these Tigers is also suspect, since they are descended from small founder populations and many are of mixed subspecies (Wang *et al.*, 2005; Wei *et al.*, 2005; Anon., 2006g).

The subspecies that is best represented in captivity in China is the Amur Tiger *P. tigris altaica*. The Hengdao River breeding centre in Heilongjiang was established for this subspecies. But the Amur Tiger is not extinct in the wild, and a consensus of international and Chinese experts is that the focus should be on habitat conservation, and encouraging natural recolonization by wild Tigers crossing over from Russia (Miquelle, 2000; Zhang *et al.*, 2005). With intensive effort and investment, the Russian population has been one of the most successful examples of Tiger conservation. China could achieve similar success by emphasizing habitat and prey base protection instead of captive breeding.

Large, individual captive Tiger populations also present authorities with a public health hazard and disease risk. In 2004, a deadly outbreak of H5N1 avian flu broke out at Thailand's Sri Racha Tiger Zoo, the largest captive Tiger population in that country (over 400 at the time). Over 140 Tigers died and were killed by euthanasia by government disease control agents. Originally the cats were thought to have contracted the disease by eating contaminated poultry, but researchers later pointed to Tiger-to-Tiger transmission of avian flu (Thanawongnuwech *et al.*, 2005). Sixteen months before the disease outbreak, 100 Tigers had been sent from the Sri Racha facility to China's Sanya Love World theme park in Hainan (Cao, 2004). (That move was widely criticized as a violation of the provisions of CITES, which prohibits commercial trade in Appendix I species. Thai Prime Minister Thaksin Shinawatra launched an investigation, and the investigation team, led by the National Intelligence Agency Director, found that the shipment had hidden commercial purposes. As a result, the head of Thailand's CITES Management Authority lost his job (Wangvipula, 2004)). Shortly before this, in 2002, H5N1 avian flu had already been isolated from Tigers at the Hengdao River breeding centre, where the death rate was 40% (Xia *et al.*, 2003). It is very difficult to halt the spread of infectious disease in such large captive populations of Tigers and other big cats.

China's Tiger captive breeding facilities have done well in their goal to breed Tigers, but a costly and potentially dangerous surplus is now evident. China's Tiger captive breeding facilities have high running costs and are uneconomical (Green *et al.*, in press), placing a financial drain on the State's Tiger conservation resources. Re-introduction into the wild of captive Tigers from these facilities is not supported by the scientific community. The Tigers in China's captive breeding facilities are diverting resources and effort from conservation of wild Tigers and their habitat, and sale of captive-bred Tiger parts would compound the harm to Tiger conservation.

CONCLUSIONS

TRAFFIC surveys in 2005/2006 found little Tiger bone or the bones of other Asian big cats for sale for Chinese medicines. Most medicine sellers were aware that these species are protected and banned from trade, and few were willing to break the law by offering Tiger or Leopard bone for sale. It is possible that illegal trade is carried on by pharmacies at a greater level than TRAFFIC has been able to detect by market surveys. But there seems to be little doubt that, over time, China's trade ban policy has greatly reduced the production, sale and use of Tiger and Asian big cat medicines in that country. Illegal trade (in any item) is unlikely ever to be completely eliminated. The levels of trade TRAFFIC has found are so low that China's policy can be judged to have successfully achieved its intended goal.

China's trade ban has been much less effective in recent years in Tibet, where a market for Tiger and Leopard skin clothing rose quickly and generated international alarm. That the trade now shows initial signs of declining is due primarily to public awareness. Tibetans surveyed by Tsering (2006) in 2005 said they would be willing to give up Tiger skin *chubas* if asked to do so by an environmental campaign. In early 2006, intensive communication efforts were launched by the environmental and religious communities to ask people in Tibet not to buy endangered wildlife products. Surveys afterwards found declining numbers of Tiger and Leopard *chubas* for sale, declining prices and reported declining interest in this type of clothing among Tibetans. This shows that public education can be a very effective tool for raising awareness, changing consumer behavior and reducing illegal trade. However, vigilance is required in case the trade has just been driven underground. Stricter enforcement measures are necessary to reduce this threat and implement China's policy successfully.

China has seized more Tiger and Asian big cat products in recent years than any other range State. This shows strong enforcement effort and considerable enforcement success. If demand continues to decline and strong enforcement efforts are maintained, illegal international trade should decline in future years. But China's investment in Tiger trade control is jeopardized by the policy of not destroying stockpiles, either seizures (after they have been used as evidence) or the bodies of Tigers in the breeding centres. Retaining stockpiles and assigning them a high value, perpetuates the impression that Tiger products could again become available (further threatening wild Tigers and challenging enforcement efforts).

Demand for Tiger products is also being encouraged by business people in China who stand to profit from any trade. This report notes a number of examples of wine being marketed as Tiger bone wine and meat being sold as Tiger meat—expensive, luxury items. Whether the Tiger products are genuine or not, or derived from wild or captive animals, they perpetuate demand for Tiger products and run counter to China's efforts to eliminate illegal trade.

While Chinese facilities have indeed been successful in breeding Tigers, this success threatens to undo all of China's achievements to date. China's Tiger breeding centres have put considerable pressure on the government to allow them to sell Tiger products. They have been breeding Tigers at a rate that is unprecedented in the world and seems aimed at forcing the government to abandon a long-standing and successful policy and accede to their commercial aspirations. The people of

China are well known for their abhorrence of waste and the Tiger breeding centres have argued that it is wasteful not to use the bodies of dead Tigers. But allowing any trade in captive-bred Tiger products threatens to waste all the effort that China has so far invested in saving wild Tigers.

There is every likelihood that legalizing trade in captive-bred Tiger products would challenge the hard-won gains that China's policy has had for wild Tigers, reversing the long-standing achievements and over-arching trend for less trade in wild Tigers. In brief:

- National and international policies prohibiting trade have helped conserve the global wild Tiger population.
- A legal supply of Tiger medicines from captive Tigers is unlikely to replace the illegal supply from wild Tigers.
- The prohibition does not appear to have harmed public health in China, because well-researched and acceptable substitutes are widely available.
- Large numbers of captive Tigers are not important for Tiger conservation in China; they divert resources from conservation of wild Tigers and their habitat and pose significant public health and safety risks.

These conclusions, which support China's long-standing trade ban policy, hinge on the endangered status of Tigers in the wild. A trade policy shown to be effective should not be changed unless a convincing science-based argument can be made that a change in policy would enhance Tiger conservation. Examination of the principal arguments for policy change suggests fails to find them convincing. The sale of captive-Tiger products on the domestic market in China would almost certainly generate significant amounts of revenue to only a small number of business people and further stimulate increases in the numbers of captive Tigers. It would also reverse a long-standing policy that is successfully protecting wild Tigers and that is fully in harmony with international conservation efforts.

To reverse official policy now would waste 15 years of enforcement effort. It would also waste 15 years of substantial interdisciplinary and co-operative efforts by China's government, medical and conservation communities to educate both consumers and practitioners about alternatives to Tiger medicines. China has made a sacrifice, both economic and cultural, in giving up its legal right to trade Tigers domestically. But undertaking this sacrifice demonstrates laudable international leadership and responsibility, given how the demands of its market in previous decades brought the Tiger to the verge of extinction both inside China and in neighbouring countries.

For the foreseeable future, China's policies will continue to play a pivotal role in determining the fate of the Tiger. In this way, the Tiger's situation is similar to the Giant Panda *Ailuropoda melanoleuca*, the very symbol of China's wildlife. With the Tiger far more endangered than the panda in China, it should be recognized as the "Panda's Little Brother" *Xiongmao de xiongdi*. As for the panda, Tiger conservation in China should have the primary aim of maintaining and restoring wild populations, with strict legal protection, no commercial trade in Tiger products, and carefully managed breeding programmes, with conservation, not finance, the primary goal in select, high-quality facilities.

RECOMMENDATIONS

There has been considerable progress in China towards reducing the trade threat to wild Tigers. This is a major achievement. In the early 1990s, it was feared that Chinese demand for Tiger products would drive the Tiger to extinction by the new millennium; that the Tiger survives today is testimony to China's prompt, strict and committed action. China's Tiger trade ban fully implements CITES Resolutions, is in harmony with the policies of neighbouring and other Tiger range States as well as former consumer countries and has served as a model for other countries to follow. **The Government of China should maintain its comprehensive Tiger trade ban policy.**

However, illegal big cat skin trade in the western regions, supplied mainly by illegal trade from neighbouring India, has not been subject to effective trade controls. **The Government of China should continue and strengthen law enforcement efforts against the illegal skin trade in the western parts of the country.**

In considering any change in policy that would allow trade in captive-bred Tiger products, as the government has been petitioned to do, the Government of China has said that "*the fundamental principle [is] that any decisions must benefit protection of Tigers in the wild and fight against illegal trade in this species and other wildlife.*" (Govt of China, 2006a). We have drawn together scientific evidence to show that any legalized trade in captive-bred Tiger products would likely jeopardize Tigers in the wild and encourage illegal trade (see section on Tiger policy). **The Government of China should reject petitions to weaken policy.**

Burgeoning captive Tiger populations are a drain on resources and encourage continued demand for Tiger products. **The Government of China should establish a moratorium on Tiger breeding, and any future breeding programmes should be international and co-ordinated in nature. Stocks of Tiger carcasses and their parts should be destroyed, and financial support for Tiger conservation in China should be directed at habitat conservation and protection measures.**

Public education has been proven effective. **The Government of China should heighten awareness of its current ban on Tiger trade, issuing a clear public statement that consumption of Tiger parts for Chinese medicine or tonics under any circumstances is not permitted. Consumption of other big cat species should also be deterred.**

REFERENCES

- Anon. (1976a). Research of dog bone gelatin wine. *Zhong Cao Yao Tong Xun* 12: 12–14 (the Dog Bone Gelatin Medicinal Wine Coordination Group of Shandong Province) (in Chinese). Referenced in Chu and But (1997).
- Anon. (1976b). Research of the anti-inflammatory effect of the pig bone injection. *Zhong Cao Yao Tong Xun* 12: 22–24 (in Chinese). Referenced in Chu and But (1997).
- Anon. (1999a). Profile: From snake trapper to wildlife protector. *People's Daily*, <http://www.people.com.cn/english/199909/07/chnmedia.html>. 6 September.
- Anon. (1999b). Two days of spot checks for Tiger medicines in Hong Kong. Unpublished report, TRAFFIC East Asia, Hong Kong.
- Anon (1999c). China's wildlife protection shoulders heavy responsibilities. *Beijing Evening News*. <http://www.dongwuyiyuan.com.cn/news/news.asp?id=633>. 21 July.
- Anon. (2002a). Is the South China Tiger extinct in the wild? *Cat News* 37:9–10.
- Anon. (2002b). Missing worker confirmed eaten by Siberian Tiger in north-eastern China. *People's Daily*. http://english.people.com.cn/200212/08/eng20021208_108112.shtml. 8 December.
- Anon. (2002c). South China Tigers learn to survive. *People's Daily*. http://english.people.com.cn/200207/27/eng20020727_100449.shtml. 27 July.
- Anon. (2003a). South China Tiger South African Project: Statement by South African and international organizations. *Cat News* 39: 20–21.
- Anon. (2003b). China has succeeded in synthesizing artificial Tiger bone powder: the medicine's effectiveness is similar to natural Tiger bone. *Chinese New Drugs Journal* 2003(9) (in Chinese).
- Anon. (2004a). Chowing down Tiger in Heilongjiang: Two jailed for eating rare Tiger. *Reuters*. http://ellensander.com/2004_07_01_cp_archive.html. 9 July.
- Anon. (2004b). Wildlife smuggling becoming increasingly serious. *Finance and Economics Channel of Beijing TV Station*. <http://btv5.qianlong.com/22224/2004/08/17/1100@2223011.htm>. 17 August.
- Anon. (2005a). China under fire for plan to lift ban on Tiger parts trade. *Agence France Press*. <http://www.keepmedia.com/pubs/AFP/2005/09/26/1026570?extID=10051>. 26 Sept.
- Anon. (2005b). State Forestry Administration: News Reports on Abolishing the Ban on Trade in Tiger Bones Unsubstantiated. *China News Service*. (in Chinese). <http://www.scsme.gov.cn/html/zhengwu/2005-10-08-18268.htm>. 8 October.
- Anon. (2005c). Branch of the State Forestry Administration has not Abolished the Ban on Trade in Tiger Bones. *Orient Daily*. (in Chinese). <http://www.jinbw.com.cn/jinbw/xwzx/zgxw/20051008374.htm>. 18 October.
- Anon. (2005d). Massive use of Tiger and Leopard skins in Tibet and China unveiled. *Cat News* 43: 12.
- Anon. (2005e). The battle of the turtle eggs. *Zhejiang News*. (Translation of article). http://www.zonaeuropa.com/20050830_1.htm. August.
- Anon. (2005f). Restaurant raided for selling Tiger urine dish. *AFP-SAPA*. http://www.iol.co.za/index.php?set_id=1&click_id=29&art_id=qw1126154522799B251. 8 September.
- Anon. (2005g). Tiger bone contraband seized at Taiwan airport. *Environmental News Service*. <http://www.ens-newswire.com/ens/aug2005/2005-08-11-02.asp>. 11 August.

- Anon. (2005h). Death of an Amur Leopard brings to light new questions. *Xinhua Net Jilin*. (in Chinese).
<http://www.cnwildlife.com/Article/Class1/Class6/200506/20050609125427.html>. 9 June.
- Anon. (2006a). China to release rare Tigers to shrinking forests. *Reuters*. <http://www.alertnet.org/thenews/newsdesk/PEK212258.htm>. 25 September.
- Anon. (2006b). China's Tiger park strapped for cash. *United Press International*. <http://www.sciencedaily.com/upi/index.php?feed=TopNews&article=UPI-1-20060814-11261000-bc-china-siberianTigers.xml>. 14 August.
- Anon. (2006c). *The Current Situation of Tiger Breeding and Difficulties Facing Guilin Xiongsen Tiger and Bear Mountain Village*. Unpublished report, Xiongsen Bear and Tiger Mountain Village, Guilin, China.
- Anon. (2006d). Tibetans set endangered animal pelts ablaze, arousing Chinese ire. *Environment News Service*. <http://www.ens-newswire.com/ens/feb2006/2006-02-24-01.asp>. 24 February.
- Anon. (2006e). Shanghai zoo sells Tiger bone wine. *Agence France Press*. <http://www.abc.net.au/news/newsitems/200602/s1567534.htm>. 11 February.
- Anon. (2006f). Package of Bengal Tiger bones posted through the mail. *Yunnan Daily*. (in Chinese). http://www.yndaily.com/html/20060619/news_89_261870.html. 15 June.
- Anon. (2006g). Manchurian Tigers to receive DNA testing in NE China breeding center. *Xinhua*. http://news.xinhuanet.com/english/2006-05/24/content_4593670.htm. 24 May.
- Anon. (2006h). Xiamen Forest Bureau seizes a Clouded Leopard. *Sohu Chengdu*. (in Chinese). <http://chengdu.sohu.com/Upload/News/20060602234459581/20060602234459581.shtml>. 2 June.
- Anon. (2006i). Xiongsen Bear and Tiger Mountain Village and Xiongsen Wine Distillery Company. Unpublished trip report, TRAFFIC East Asia—China Programme, Beijing.
- Anon. (2007). Administration denies China's Tiger bone trade ban has been eased. *Peoples Daily Online*, 11 January. <http://english.people.com.cn/200701/11/eng20070111_339941.html>
- Banks, D., Desai, N., Gosling, J., Joseph, T., Majumdar, O., Mole, N., Rice, M., Wright, B. and Wu, V. (2006). *Skinning the Cat: Crime and Politics of the Big Cat Skin Trade*. Environmental Investigation Agency and the Wildlife Protection Society of India, London, UK.
- Banks, D. and Newman, J. (2004). *The Tiger Skin Trail*. Environmental Investigation Agency, London, UK.
- Bindra, P.S. (2006). Alarm over Tiger data. *Cat News* 44:7.
- Breitenmoser, U., Tilson, R. and Nyhus, P. (2006). Reintroduction of the Chinese Tiger. *Cat News* 44: 15.
- CATT (Campaign Against Tiger Trade). (2006). *Information for Chinese Medicine Practitioners*. <http://www.savetheTigerfund.org/Content/NavigationMenu2/Initiatives/CATT/TCM/default.htm>. Viewed 15 December.
- Cao, DeSheng (2004). Thai Tigers safe and sound in Hainan. *China Daily*. http://www.chinadaily.com.cn/english/doc/2004-05/13/content_330516.htm. 13 May.
- Cao, Yong (2004). Three men prosecuted for illegally killing and selling Snow Leopard skin and bone. *Lanzhou Morning News*. (in Chinese). <http://www.gansudaily.com.cn/20040520/706/2004520A01342018.htm>. 20 May.
- Cat Specialist Group (2002). *Panthera tigris*. In: IUCN (2006). *2006 IUCN Red List of Threatened Species* <http://www.redlist.org>, Viewed 19 September 2006.
- Cat Specialist Group (2006a). *Regional Conservation Strategy for Lions in West and Central Africa*. http://www.felidae.org/DOUALA/C_W_Lion_Strategy_UK.pdf.

- Cat Specialist Group (2006b). *Regional Conservation Strategy for Lions in Eastern and Southern Africa*. <http://www.felidae.org/JOBURG/Lion%20Conserv%20Strat%20E-S.pdf>.
- CCTV (2003). *To Tell the Truth: with guests Zhou Weisen, Zhang Endi and Ma Jianzhang*. Transcript, China Central Television. (in Chinese). <http://www.cctv.com/program/talkshow/content/8703.shtml>. 9 September.
- CCTV (2006). *Wealth Story: with guest Zhou Weisen*. Transcript, China Central Television. (in Chinese). <http://www.cctv.com/program/cfgsh/20060915/101207.shtml>. 15 September
- Chen, Junhua (1990). Two types of Tiger bone counterfeits. *Journal of Chinese Medicinal Materials* 10: 26 (in Chinese).
- Chen, Junhua (1991). Introduction to three types of fake Tiger penis. *Journal of Chinese Medicinal Materials* 4:24 (in Chinese).
- Cheng, T. (2007). China's Tigers pushed to the brink. Al Jazeera, January 22. <http://english.aljazeera.net/NR/exeres/78BC2F23-6B0C-4C31-84E5-2518A3EB8F8B.htm>. 24 January.
- Chu, Henry Hin-Chung and But, Paul Pui-Hay (1997). *Progress in the research of Tiger bone substitutes*. Paper presented at the First International Symposium on Endangered Species Used in Traditional East Asian Medicine: Substitutes for Tiger Bone and Musk. TRAFFIC East Asia and the Chinese Medicinal Material Research Centre, Hong Kong.
- CITES (1994). *Conservation of and Trade in Tigers*. Resolution Conf. 9.13, Ninth meeting of the Conference of the Parties, Fort Lauderdale (United States of America), 7–18 November. In Mainka, S. (1997). Tiger Progress? The Response to CITES Resolution Conf. 9.13. TRAFFIC International, Cambridge, UK.
- CITES (1999). Tiger Technical Missions report. 42nd meeting of the CITES Standing Committee, Lisbon, Portugal. <http://www.cites.org/eng/com/SC/42/42-10-4.pdf>. Viewed 23 September, 2006.
- CITES (2000). *The CITES Tiger High-Level Political Missions*. Doc 11.30 Annex 2 (Rev 1). Eleventh meeting of the Conference of the Parties, Gigiri (Kenya). 10–20 April.
- CITES (2002). *Conservation of and trade in Tigers and other Appendix-I Asian big cat species*. Resolution Conf. 12.6, Twelfth meeting of the Conference of the Parties to CITES, Santiago (Chile), 3–15 November. <http://www.cites.org/eng/res/all/12/E12-05.pdf>. Viewed 23 September, 2006.
- CITES (2004). *Conservation of and trade in Asian Big Cats*. Decision 13.22 <http://www.cites.org/eng/dec/valid13/13-22.shtml>
- CITES (2005). *Summary record (Rev. 1) of the 53d meeting of the Standing Committee*. Geneva, Switzerland, 27 June – 1 July, 2005.
- CITES (2006). *Relationship between Ex Situ Production and In Situ Conservation*. SC54 Doc. 34, 54th meeting of the CITES Standing Committee, Geneva, Switzerland. 2–6 October, 2006.
- Conrad, K. (2000). *Safety in Numbers: A Review of the Breeding Center for Felidae at Hengdaohezi*. Unpublished report, http://www.felidae.org/LIBRARY/Chinese_Breeding_Centre_Report.pdf. Viewed 24 September 2006.
- Conrad, K. (2006). *Chinese government investigates the feasibility of limited domestic trade in Tigers*. *Cat News* 45: 22.
- Cui, Lidong (2003). Destruction cannot use: 67 dead Tigers have become a burden. *Heilongjiang Daily News*. (in Chinese). http://www.hljdaily.com.cn/gb/content/2003-09/16/content_136481.htm. 16 September.

- Deng, Xuejian and Wang, Bin (2001). South China Tiger trace discovered in Hunan Taoyuan. *Acta Theriologica Sinica* 47(1):118–119 (in Chinese).
- Dinerstein, E., Wikramanayake, E., Robinson, J., Karanth, U., Rabinowitz, A., Olson, D., Mathew, T., Hedao, P. and Connor, M. (1997). *A framework for identifying high priority areas for the conservation of free-ranging Tigers*. World Wildlife Fund and the Wildlife Conservation Society, Washington, DC, USA. <http://www.savetheTigerfund.org/AM/TemplateRedirect.cfm?template=/CM/ContentDisplay.cfm&ContentID=2147>.
- Ding, Qiang and Lei, Jianqiang (2006). Four men prosecuted for illegally selling rare wildlife products. *Chungheng Evening News*. (in Chinese). http://www.yn.xinhuanet.com/newscenter/2006-01/13/content_6043436.htm. 13 January.
- Ding, Peixian (1985). The difference between Tiger and ox penises. *Journal of Chinese Medicinal Materials* 3:24 (in Chinese).
- Ding, Peixian (1983). Identification of one type of false Tiger bone (forelimb bone of ox calf). *Technology of Traditional Chinese Medicine* 5:24 (in Chinese).
- Ellis, R. (2005). *Tiger Bone and Rhino Horn: The Destruction of Wildlife for Traditional Chinese Medicine*. Island Press, Washington, DC, USA.
- Flaws, B. (1997). *Chinese Medicinal Wine Elixirs*. Blue Poppy Press, Boulder, CO, USA.
- GaMa, Duoji and Zhang, Ailin (2004). Smuggling of endangered wildlife skin uncovered in Tibet. *Xinhua Net Lhasa*. (in Chinese). <http://china.qianlong.com/4352/2004/07/23/1320@2178803.htm>. 23 July.
- Gao, Sheng and Yang, Tuanzhu (2001). The illegal sale of Tiger skin and bone in Yunnan. *Chinese Wildlife* 22 (1):43 (in Chinese).
- Gao, Xiang, Shi, Yan and Chang, Tian (1999). Peasant in Shanxi Province arrested for illegally killing a common Leopard. *Inspection Daily*. <http://dailynews.sina.com.cn/society/1999-8-26/9175.html>. 26 August.
- Ginsberg, J. (2001) (Ed.). *Saving the Tiger: Assessing Our Success*. Proceedings of a three-day workshop. Wildlife Conservation Society, New York, USA. <http://www.savetheTigerfund.org/AM/TemplateRedirect.cfm?template=/CM/ContentDisplay.cfm&ContentID=3009>
- Govt of China (1993). *Notice Promulgated by the State Council on the Prohibition of Trade in Rhinoceros Horn and Tiger Bone*. May 29, Government of the People's Republic of China. English translation by Mills (1997).
- Govt of China (1988). *Law of the People's Republic of China on the Protection of Wildlife*. Adopted at the Fourth Meeting of the Standing Committee of the Seventh National People's Congress and promulgated by Order No. 9 of the President of the People's Republic of China on November 8, 1988 and effective as of March 1, 1989 <http://www.animallaw.info/nonus/statutes/stenwildlaw.htm>. Viewed 1 September 2006.
- Govt of China (2006a). *Fact Sheet*. Information document issued by the Delegation of the People's Republic of China to the 54th meeting of the CITES Standing Committee, Geneva, Switzerland, 2–6 October 2006.
- Govt of China (2006b). *Introduction of China Wildlife Enforcement CITES Management Authority, State Forestry Administration*. (in Chinese). http://www.cites.gov.cn/home/5year1_%20zhifa.htm. Viewed 7 August, 2006.
- Govt of China (2007). *Report on Implementing Resolution Conf. 12.5 of CITES*. Report by the China CITES Management to Authority to the CITES Secretariat. Working document of the Fourteenth Conference of the Parties to CITES (3–15 June 2007, The Hague, The Netherlands).

- COP14 Doc. 52 Annex 1. <http://www.cites.org/common/cop/14/doc/E14-52A01.pdf>, viewed 14 February 2007.
- Gratwicke, B., Seidensticker, J., Shrestha, M., Virnilye, K. and Birnbaum, M. (2006). *Staving Off Extinction: A Decade of Investments to Save the World's Last Wild Tigers (1995–2004)*. Save the Tiger Fund, Washington DC, USA. <http://www.savetheTigerfund.org/AM/TemplateRedirect.cfm?template=/CM/ContentDisplay.cfm&ContentID=3128>.
- Green, M.J.B., Taylor, P.M., Feng, Yin and Lee, S.K.H. (in press). *Part of the Solution or Part of the Problem? Wildlife Farming in China for Use in Traditional Medicine and its Relationship with Conserving Wild Populations of Animal Species*. TRAFFIC International, Cambridge, UK.
- Guo, Xiqing; Ye, Jing; and Li Jingang (2006). Research progress on the skeleton of Tiger and its substitute. *Journal of Shaanxi Normal University (Natural Science Edition)* 34 (March): 218–221 (in Chinese).
- Guo, Yinfeng, Zou, Xueying, Chen, Yan, Wang, Di and Wang, Sung (1997). *Sustainability of wildlife use in traditional Chinese medicine*. Pp 190–220 in *Conserving China's Biodiversity*. China Council for International Cooperation on Environment and Development, Beijing.
- Harding, A. (2006). Beijing's penis emporium. *BBC News*. http://news.bbc.co.uk/1/hi/programmes/from_our_own_correspondent/5371500.stm. 23 September.
- Huang, Xiangyun, Hu, Defu, Liu, Weishi and Muntifering, J. (2003). Field survey on South China Tigers and their habitat evaluation in Yihuang Provincial Reserve in Jiangxi province. *Journal of Beijing Forestry University* 25(4):54–58 (in Chinese).
- Jackson, P. (2000). Preface. In: Nowell, K. (2000). *Far From A Cure: The Tiger Trade Revisited*. Pp v–vi. TRAFFIC International, Cambridge, UK.
- Jackson, P. (2006). Tibet and Tigers. Editorial in *Cat News* 44: 3.
- Jenkins, R.W.G. (2006). *International Conservation of Tigers: A New Approach by China*. Unpublished report. Creative Conservation Solutions, Belconnen, Australia.
- Ji, Yuncheng and Wang, Yuanchang (2001). The case of smuggling and selling Amur Tiger in Acheng, Heilongjiang. *Liaoning Daily*. (in Chinese). <http://newspaper.lndaily.com.cn/lnr/b/200106/22/jdxw2.htm>. June 22.
- Jian, Zhengwu and Zhou, Lin (2002). Tiger and Leopard skin seizure. (in Chinese). <http://www.hf365.com/epublish/gb/paper2/20020301/class000200011/hwz131342.htm>. 24 April.
- Johnson, K.A.; Yu, Jinping; Wang, Yingxiang; Wang, Sung; and Fuller, T.K. (1993). *The Leopard Cat (Felis bengalensis) in China: Ecology and Management for Sustainable Utilization*. Progress report, 3 August, 1992 – 31 December, 1992.
- Karanth, K.U., Nichols, J.D., Seidensticker, J., Dinerstein, E., Smith, J.L.D., McDougal, C., Johnsingh, A.J.T., Chundawat, R.S. and Thapar, V. (2003). Science deficiencies in conservation practice: the monitoring of Tiger populations in India. *Animal Conservation* 6:141–146.
- Kunming Institute of Zoology. (2006). *DNA Wine Test Report*. Unpublished report to TRAFFIC East Asia from the Kunming Institute of Zoology, Chinese Academy of Sciences.
- Li, Chan and Jiang, YingYing (2006). Guangxi Tiger bone mystery case: who lied? *Beijing Science and Technology News* 34 (in Chinese). <http://www.gotoread.com/2002/mymag/article.asp?NewID=4FB0C69A-074A-48C2-B08B-789A7B4A3B5E>. September.
- Li, Chaoying and Zhang, Dafang (1997). *The Research on Substitutes for Tiger Bone*. Paper presented at the First International Symposium on Endangered Species Used in Traditional East Asian

- Medicine: Substitutes for Tiger Bone and Musk*. TRAFFIC East Asia and the Chinese Medicinal Material Research Centre, Hong Kong.
- Li, Tong; Jiang, Jinsong; Wu, Zhigang; Han, Xiaodong; Wu, Jingcai; and Yang, Xingjia. (2001). Survey on Amur Tigers in Jilin Province. *Acta Theriologica Sinica* 21(1): 1–6 (in Chinese).
- Lin, H. and Chen, S. 1988. *Original Color Atlas for Discriminating Chinese Traditional Drugs*. Science and Technology Press, Guangdong (in Chinese).
- Liu, Jiawu, Wu, Faqing, Ge, Jiwen, He, Dingfu, Dai, Zongxing, Shi, Daoliang, Man, Jinshan and Peng, Zonglin. (2002). Preliminary investigation of South China Tiger in the Qizimei Mountains Nature Reserve, Hubei province, China. *Journal of Central China Normal University (Nat. Sci.)* 36(2): 213–216 (in Chinese).
- Liu, Ping and Peng, Xianwen. (2005). Investigation on East Chinese Tigers and their habitat in Yihuang county, Jiangxi province. *Jiangxi Forestry, Science and Technology*. May: 32–33 (in Chinese).
- Liu, Q.F., *et al.* (1995a). The comparative identification of Tiger, Pig, Ox, Cat, Bear, Leopard and Dog bone from ultra-violet spectrum. *Journal of the Beijing University of Traditional Chinese Medicine* 18(3): 64–65 (in Chinese). Referenced in Chu and But (1997).
- Liu, Q.F., *et al.* (1995b). The comparative identification of Tiger, Pig, Ox, Cat, Bear, Leopard and Dog bone with ultra-red spectrum. *Journal of the Beijing University of Traditional Chinese Medicine* 18(3): 67–68 (in Chinese). Referenced in Chu and But (1997).
- Liu, Yu (2005). *Studies on Wild Amur Tiger (Panthera tigris altaica) During Winter Time in Hunchun Nature Reserve, Jilin*. 2005 master dissertation of East China Normal University, China.
- Liu, Zhen and Han, Dawei (2006). Clinical research progress on Tiger bone and artificial Tiger bone. *Chinese J Trad Med Traum & Orthop*. April 2006 14(2): 73–75 (in Chinese).
- Lu, Houji and Sheng, Helin (1986). Distribution and status of the Chinese Tiger. Pp 51–58 in S.D. Miller and D.D. Everett, eds. *Cats of the World: Biology, Conservation and Management*. National Wildlife Federation, Washington DC, USA.
- Luo, Zhansheng (2005). Tigers breeding fast; family planning difficult. *South China News*. (in Chinese). <http://discovery.chinabyte.com/31/2073031.shtml>. 16 August.
- Ma, Yiqing (1998). *Panthera tigris*. Pp. 122–125 in Wang, Sung. (Ed.) *China Red Data Book of Endangered Animals*. National Environmental Protection Agency and Endangered Species Scientific Commission P.R.C. Science Press, Beijing (in English and Chinese).
- Mainka, S. (1997). *Tiger Progress? The Response to CITES Resolution Conf. 9.13*. TRAFFIC International, Cambridge, UK.
- Mao, H.N., *et al.* (1995). Cluster analysis of trace elements in Tiger bone and its analogues. *Journal of Beijing University of Traditional Chinese Medicine* 18(6): 37–38 (in Chinese). Referenced in Chu and But (1997).
- Mao, Yongwen (2006). Raohe border inspection station in Heilongjiang discovers Tiger smuggling. *Xinhua Net*. 31 May. http://news.xinhuanet.com/society/2006-05/31/content_4623850.htm. 31 May.
- Meacham, C. (2006). *Mandarin Orange*. Weblog: <http://weblog.signonsandiego.com/weblogs/thebarebodkin>. Viewed 22 June.
- Meng, Xianlin and Zhai, Baoguo (2000). Prohibition of trade in Tiger bone and related issues. In *Proceedings of the International Workshop on Wild Amur Tiger Population Recovery Action Plan, Harbin, China*, Pp 87–93. Wildlife Conservation Society, Beijing, China.

- Mills, J.A. (Ed). (1997). *Rhinoceros Horn and Tiger Bone in China: An Investigation of Trade Since the 1993 Ban*. TRAFFIC International, Cambridge, UK.
- Mills, J.A. and Jackson, P. (1994). *Killed for a Cure: A Review of the Worldwide Trade in Tiger Bone*. TRAFFIC International, Cambridge, UK.
- Miquelle, D. (2000). Overview of threats to the Amur Tiger. Pp 28–29 in *Proceedings of the 2000 International Workshop on Wild Amur Tiger Population Recovery Action Plan, Harbin, China and the 2002 National Workshop on Progress of Wild Amur Tiger Population Recovery Action, Hunchun, China*. Wildlife Conservation Society, Beijing, China.
- Mitra, B. (2006a). Sell the Tiger to Save It. *New York Times* (Opinion section). 15 August.
- Mitra, B. (2006b). Saving the Tiger: China and India move in radically different directions. *PERC Reports* 24(3): 3–6.
- Mulliken, T. and Haywood, M. (1994). Recent data on trade in rhino and Tiger products, 1988–1992. *TRAFFIC Bulletin* 14(3):99–106.
- Nowell, K. (2000). *Far From A Cure: The Tiger Trade Revisited*. TRAFFIC International, Cambridge, UK.
- Nowell, K. and Jackson, P. (1996). *Wild Cats: Status Survey and Conservation Action Plan*. IUCN SSC Cat Specialist Group, Gland, Switzerland (406 pp).
- Qian, Yu and Ma, Ming (2004). Field research on Snow Leopard. *Xinjiang Tianshan Net*. (in Chinese). <http://www.tianshannet.com.cn/GB/channel59/1337/1348/200602/20/229848.html>. 27 November.
- Sanderson, E., Forrest, J., Loucks, C., Ginsberg, J., Dinerstein, E., Seidensticker, J., Leimgruber, P., Songer, M., Heydlauff, A., O'Brien, T., Bryja, G., Klenzendorf, S. and E. Wikramanayake. (2006). *Setting Priorities for the Conservation and Recovery of Wild Tigers: 2005–2015. The Technical Assessment*. WCS, WWF, Smithsonian and NFWF-STF, New York-Washington DC, USA. <http://www.savetheTigerfund.org/AM/TemplateRedirect.cfm?template=/CM/ContentDisplay.cfm&ContentID=2725>. Viewed 1 September.
- Seidensticker, J., Jackson, P. and Christie, S. (1999) (Eds). *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*. Cambridge University Press, Cambridge, UK. http://www.savetheTigerfund.org/AM/Template.cfm?Section=Papers_and_Theses&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=3115
- Simpson, P. (2006). Tibet express puts Leopards on fast track to extinction. *UK Telegraph*. <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/10/22/wtibet22.xml>. 21 October.
- Song, Wenqi. 1991. Identification of true and fake deer and Tiger penises. *Journal of Chinese Medicinal Materials* 2:21 (in Chinese).
- SFA (State Forestry Administration) 2001. *The China Action Plan for Saving the South China Tiger*. Draft Outline. http://www.andymcdermott.com/action_plan.htm, downloaded 24 September 2006.
- Southworth, J. (1999). The scandal of Tiger wine. *Associated Newspapers (UK)*. 21 October: 24–25.
- Sun, Haiyi. (2005). Monitoring of wild Amur Tiger populations in Heilongjiang province. *Forestry Science & Technology* 30(6): 33–35 (in Chinese).
- Sun, LiHong and Li, QiaoYin (2002). Research summary of Tiger bone and its substitutes. *Academic Periodical of Changchun College of Traditional Chinese Medicine* 18:59–60 (in Chinese).

- Sung, X.Q. *et al.* (1995). Research on trace elements in Tiger bone and its analogues. *Journal of Beijing University of Traditional Chinese Medicine* 18(4): 69 (in Chinese). Referenced in Chu and But (1997).
- Suo, YouRui, Zhang, BaoChen and Wang, Hanqing (2004). Comparison on mineral elements in sailong and Tiger bone. *Chinese Traditional and Herbal Drugs* 35(4): 445–448 (in Chinese).
- Thanawongnuwech, R., *et al.* (2005). Probable Tiger-to-Tiger transmission of Avian Influenza H5N1. *Emerging Infectious Diseases* 11(5):699–701.
- Theile, S. (2003). *Fading Footprints: The Killing and Trade of Snow Leopards*. TRAFFIC Network, Cambridge, UK, 72 pp. <http://www.traffic.org/content/218.pdf>
- Tilson, R., Nyhus, P., Jackson, P., Quigley, H. Hornocker, M., Ginsberg, J., Phemister, D., Sherman, N. and Seidensticker, J. (2000) (Eds.). *Securing a Future for the World's Wild Tigers*. Save the Tiger Fund, Washington, DC, USA, 24 pp. http://www.savetheTigerfund.org/AM/Template.cfm?Section=Conference_Proceedings&Template=/CM/ContentDisplay.cfm&ContentID=2140
- Tsering, Dawa. (2006). *Survey Report on Illegal Trade, Market and Consumption of Asian Big Cat Skins in Tibet*. Unpublished report by WWF—Lhasa Programme Office, Tibetan Academy of Sciences and WWF China's TRAFFIC Programme.
- USFWS (US Fish and Wildlife Service) (2006). *Regulations to implement the Captive Wildlife Safety Act*. Federal Register 71(20): 5041–5048. <http://www.epa.gov/fedrgstr/EPA-IMPACT/2006/January/Day-31/i1191.htm>. Viewed 21 October, 2006.
- Wan, QiuHong and Fang, ShengGuo (2003). Application of species-specific polymerase chain reaction in the forensic identification of Tiger species. *Forensic Science International* 131:75–78.
- Wang, Sung. (Ed.) (1998). *China Red Data Book of Endangered Animals*. National Environmental Protection Agency and Endangered Species Scientific Commission P.R.C. Science Press, Beijing (in English and Chinese).
- Wang, Wei, Shen, Qingyong and Yin, Yuzhong (2005). Demographic studies on captive South China Tigers. *Acta Theriologica Sinica* 23(1):6–9 (in Chinese with English abstract).
- Wang, Weisheng. (2006). *The implementation, results and development of Chinas wild animals products labelling system*. TRAFFIC East Asia—China Programme Newsletter 2: 1–2 (in Chinese).
- Wang, Yingchun (2000). Poor Wild animals. *Yunnan Daily*. (in Chinese). <http://www.yndaily.com/zl/daguan/0315/dg03159.htm>. 4 April.
- Wang, Z. *et al.* (1974). Preliminary analysis of the Tiger, Leopard and Dog bone used in Chinese medicine. *Shaanxi Medical Journal* 5: 18–20 (in Chinese). Referenced in Chu and But (1997).
- Wang, Z. *et al.* (1975). Research on Tiger bone and substitutes. *Shaanxi Medical Journal* 2: 51–54 (in Chinese). Referenced in Chu and But (1997).
- Wangvipula, R. (2004). Head of CITES Thailand to face panel in Tiger inquiry. *Bangkok Post*. <http://www.warhai.org/content/education/Tigers.htm> 27 July.
- Wei, Kun; Zhang, ZhiHe; Zhang, WenPing; Shen, FuJun; He, Guangxin; Hou, Rong; Xie, Zhong; Liu, Nong; and Yue, BiSong. (2005). Sequence variation of mitochondrial DNA ND5 in captive South China Tigers (*Panthera tigris amoyensis*). *J. Nat. Hist.* 39(46):3379–3384.
- Werner, B. (2005). Distribution, abundance and reproductive biology of captive *Panthera tigris* populations living within the United States of America. *Feline Conservation Federation magazine*

- 49(2), March/April. <http://www.thefcf.com/species/dynamics.asp?key=190>. Viewed 21 October 2006.
- Wildlife Trust of India. (2006). Prices of Tiger skin drop in Tibet. *Tibet Environmental Watch report*. <http://www.tew.org/archived/Tigerskin.drop.html>. Viewed 9 October, 2006.
- Wu, J. (2006). *World Without Borders: The Internet as Hotspot of Illegal Wildlife Trade*. TRAFFIC East Asia, Taipei.
- Wu, Hao and Li, Haiqiu (2002). The Yunnan Forest Police uncovered a severe case of smuggling and selling wildlife products. *CCTV International*. (in Chinese). http://www.hicourt.gov.cn/NEWS/news_detail.asp?newsid=2002-5-23-8-56-17. 22 May.
- Xia, XianZhu; Gao, YuWei; Hu, RongLiang; Wang, LiGang; Liu, Dan; Zou, XiaoHuan; Huang, Geng; He, WenQi; Wang, Wei; Su, WeiLin; and Liu, WenLiang. (2003). The first finding of Tiger influenza by virus isolation and specific gene amplification. *China J. Vet. Sci.* 23(2):107–110 (in Chinese)
- Yang, ChaoPeng *et al.* (1993a). Studies on the physical and chemical characteristics of Tiger, Sika deer, Red deer, Pig, Goat and Dog bone I. Comparative studies on the amino acid components of the gelatin in the four limbs and vertebra of Tiger and other animals. *Chinese Journal of Pharmaceutical Drug Analysis* 13(5): 307–310 (in Chinese). Referenced in Chu and But (1997).
- Yang, ChaoPeng *et al.* (1993b). Studies on the physical and chemical characteristics of Tiger, Sika deer, Red deer, Pig, Goat and Dog bone II. Comparative studies on the iso-electric point of the gelatin in the four limbs and vertebra of Tiger and other animals. *Chinese Journal of Pharmaceutical Drug Analysis* 13(5): 311–313 (in Chinese). Referenced in Chu and But (1997).
- Yang, Ran (2003). Four foreigners who smuggled rare wildlife products were severely punished. *Yunnan Channel of Xinhua Net*. (in Chinese). http://www.yn.xinhuanet.com/ynnews/2003-01/07/content_127750.htm. 7 January.
- Yang, Xinyu (2005). Restaurant sells cat meat. *Chongqing Morning News*. (in Chinese). <http://news.sohu.com/20051128/n227608542.shtml>. Viewed 28 November, 2006.
- Yates, B. (2000). Recognition of Tiger parts in trade. Pp 90–96 in Nowell, K. 2000. *Far From A Cure: The Tiger Trade Revisited*. TRAFFIC International, Cambridge, UK.
- Yu, Xiaochun, Sun Baogang, Sun Haiyi, *et al.* (2000). Amur Tiger Distribution and Population in Heilongjiang Province. *Wildlife* February:14–16 (in Chinese).
- Yunnan Forest Bureau. (2006). Yunnan Forest Police uncovered a case of illegal transporting and selling common Leopard products. China CITES MA Net. (in Chinese). http://www.cites.gov.cn/frameset/text/xwdt/dt_blank.asp?id=4356. March.
- Zhang, B.C. (1996). The important development of Tiger bone and its Substitutes—Sailong bone. *Journal of Information on Traditional Chinese Medicine* 7:38 (in Chinese). Referenced in Chu and But (1997).
- Zhang, Endi, Schaller, G.B., Lu, Zhi and Zhang, Hong. (2002). Tiger predation on livestock in Gedang, Medog, Southeast Tibet. *Acta Theriologica Sinica* 22(2):81–86 (in Chinese).
- Zhang, Endi and Su, Ti. (2005). A preliminary survey on the presence of Indochinese Tiger (*Panthera tigris corbetti*) in Yunnan province, China. *Cat News* 42: 9–12.
- Zhang, E., Miquelle, D., Wang, T. and Kang, A. (eds). (2005). Proposals for recovery of the wild Amur Tiger population in north-east China. Pp 265–275 in *Recovery of the wild Amur Tiger population in China: progress and prospect*: Proceedings of the 2000 International Workshop on Wild Amur Tiger Population Recovery Action Plan, Harbin, China and the 2002 National

- Workshop on Progress of Wild Amur Tiger Population Recovery Action, Hunchun, China. China Forestry Publishing House: Beijing, China. 286pp (Chinese and English).
- Zhang, Jun; Wu, Linsheng; Sun Shuchun, *et al.* (2005). Clinical study on effect of JINTIANGE capsules for treatment of primary osteoporosis. *Chin. J. Osteoporos.* 11(4):490–495 (in Chinese with English abstract).
- Zhang, Kejia. (2005). Can the trade of Tiger resources be opened to a limit? *South Weekend* (in Chinese). <http://www.cnwildlife.com/Article/Class23/Class24/200508/20050829234911.html>. 29 August.
- Zhang, Kejia (2006). National ban cannot stop Tiger bone sales. *China Youth Daily*. English translation of Chinese original. <<http://zqb.cyol.com/node/2006-08/25/zgqnb.htm>> in IFAW. (2006). 29 August. *Made In China: The Illicit Trade in Tiger Bone in China*. International Fund for Animal Welfare. www.savetheTigerfund.org/Content/NavigationMenu2/Initiatives/CATT/TigerFarming/MadeinChinaFINAL.pdf. Viewed 5 October, 2006.
- Zhao, Heng. (2004). Stolen bones case in a dramatic challenge to existing regulations on corruption assessment. *Beijing Youth Daily*. (in Chinese). <http://news.sohu.com/2004/03/02/16/news219261665.shtml>. 2 March.
- Zhao, Fulin; Jiao, Hongping; and Hou, Wangyong. (2005). Six old men were prosecuted due to illegally buying and selling common Leopard skin and bone. *China Court Website*. (in Chinese). http://news.xinhuanet.com/legal/2005-10/12/content_3608101.htm. 12 October.
- Zhou, Lu; He, TingWei; and Cai Xin (2006). Cluster analysis and correlative analysis for bone of *Panthera tigris* L. and its substitutes. *China Academic Journal*. 21(2): 136–138 (in Chinese with English abstract).

APPENDIX I. THE VALUE OF MEDICINAL USE OF TIGER BONE, AND AN EVALUATION OF THE PROSPECT OF RAISING TIGERS

虎骨的药用价值——兼评养殖虎的出路

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虎的价值，主要体现在两个方面。一是皮张，用作装饰和收藏；二是虎骨酒药和保健品。

虎骨的药用价值究竟有多大值？

The value of Tigers is mainly shown in two aspects. One is the skin, used for decoration and collection; two is Tiger bone medicinal liquor and supplemental health products. Just how great is the value of the medicinal use of Tiger bones?

一. 虎骨有何特异？

1. What is so special about Tiger bones?

虎骨药酒已有千余年历史，据记载，其主要功能有：除湿散寒、舒筋活络、活血化瘀、

强筋健骨、补肝益肾、止痢。本草同时也叙述了羊骨、鹿骨和狗骨酒的应用，它们都属于骨类药，骨类药单纯的骨粉和骨胶既说也有消炎、镇痛、抗骨质疏松作用，虎骨是骨类药中的一种。近期许多研究表明虎骨并不含有特殊成份，它与狗骨、羊骨、猪骨等其他哺乳动物骨骼在成份上并无差别，二者骨的成份相同，只是含量上有些差异而已，并没有特殊之处。

Tiger bone medicine has a history over a thousand years old, according to records its main functions are: to get rid of wet energy and to disperse cold energy (Chinese believe in various energy types, of which wet and cold energy are undesirable), to relax tendons and increase flow in veins, to increase circulation and dissolve bruises, to strengthen tendons and bones, to supplement the liver and improve kidney function and to stop diarrhoea. At the same time, *Ben-Tsao* (“*Original Plants*”, an ancient book on herbology) also states applications of liquors made from lamb bones, deer bones and dog bones, all of which are categorized as bone-related medicines. Bone related medicines, pure bone powders or bone starches can help with inflammation, act as a painkiller or help prevent osteoporosis. Tiger bone medicine is one of these bone-related medicines. Recent studies indicate that Tiger bones do not contain anything special and that its elements are not any different from that of dog bones, lamb bones, pig bones and other mammal bones. The only difference is in the quantities of each element.

二 虎骨药是传统药，传统药是否一定应要继承？

2. Do we need to inherit the tradition of Tiger bone medicine?

传统的，不一定是科学的。在几百年前医学还不发达的时代，人们患病时往往进行尝试法，成功机会多的就保留下来，其中不排除会有偶然性，会有些靠不住的

“药”传给后人。如夜明砂（蝙蝠粪）、望月砂（野兔粪），会有多少疗效？遗憾的是直到最近还有人将它列入动物药名录中，还舍不得抛弃此类糟粕，在药源相当丰富的今天，为什么非要病人服用动物粪药呢？那些即使有某些疗效的药，但并非特效药，且有疗效相当、资源更丰富、更廉价的药酒时，为什么一定要继承呢？

Tradition is not necessarily scientific. Hundreds of years ago when medicine was not very developed, when people were sick they practiced trial-and-error methods, keeping the cures with higher success rates. Of these we cannot eliminate those that were mere coincidences and thus some unreliable “medicines” were passed down. For example, bat excrement and wild rabbit faeces—how effective are these cures? Unfortunately, there are still those who have recently categorized these in the lists

of animal medicines. Why are they not willing to eliminate this garbage in these days when medicinal sources are so abundant? Why do we want patients to still consume animal feces? Even when some of these are slightly effective, they are not “special effect medicines” (i.e. Penicillin) and also, there are other medicines just as effective whose sources are more abundant and cheaper, so why must we continue these old traditions?

四 虎骨药为什么会广为流传？

3. Why is Tiger bone medicine so widely spread?

在骨类药中，为什么只有虎骨药广为流传？是不是它的效果特别好呢？虎骨成份既然并无特异性，显然不是它的疗效，很可能是心理因素的作用。老虎威猛、健壮，是百兽之王，将虎视为健康的象征是很自然的。几百年前的老百姓用其骨，肉，血和某些器官来尝试治疗自身相应部位的疾病是可以理解的。直到近来，江西农民还是相信虎、豹全身都是补品，有眼疾者吃其眼治眼，体虚者饮其血，虎骨当然成了对筋骨的大补品了。因为毕竟是肉类，多少有点营养成份，心理上也有个安慰。虽然羊骨和狗骨等也有类似于虎骨的作用，但从心理上，虎骨影响更大，更易被群众接受。

Of the bone-related medicines, why is only Tiger bone medicine widely spread? Is its effect especially good? Tiger bone composition is not particularly effective, so it must be the psychological aspect. Tigers are fierce and strong, king of the beasts, so it is very likely that Tigers are seen as a symbol of health. Hundreds of years ago, people used its bones, meat, blood and certain organs to try and cure illnesses of corresponding counterparts (i.e., eat liver to cure liver problems). Until recently, Jiang-Xi still believed that Tigers' and Leopards' entire bodies are of medicinal merit; if there are problems with the eye then eat the eye, people with weak blood should drink the blood. So, Tiger bones are a great cure for our bone and tendon problems. Since it is essentially a meat, at the least it has certain nutrients which allow you to feel better. Although lamb bones, dog bones, etc. have very similar effects, psychologically Tiger bones have a stronger effect and are more easily accepted by people.

三. 虎骨的药效究竟如何？

4. What are the medicinal effects of Tiger bones?

虎骨的成份与其它动物骨相比，既然没有特异之处，说它有什么特效实在太勉强了，至今并无具有说服力的科学依据。

When Tiger bones are compared to other animal bones there isn't anything special about them. To say that it is special, is really too much of a stretch and has no scientific foundation.

1 为什么虎骨入药不单用，而要与白酒配合，白酒本身是活血的，后来又配伍木瓜，鹿角，藏红花等多达一、二十种的中药。这些药和酒的加入，显然与虎骨作用不明显而逐步改进的结果，加了酒和这么多钟药材后，其疗效是虎骨所为还是药酒所为呢？

1. Why can't you use Tiger bones alone for medication, rather than accompanied by white liquor (a type of very strong Chinese alcohol)? White liquor alone helps circulation and later it is paired with papaya, deer antlers, Tibetan Red Flower and up to 10–20 different herbs. When these herbs and liquor are added to Tiger bones, it obviously proves that the medicinal benefit of the Tiger bones alone is not sufficient. After having added so many herbs and liquor, which is actually effective—the Tiger bones or the herbal liquor?

2 西北高原研究所与同仁堂合作配制的“塞隆风湿酒”，有与虎骨酒完全相同的功能。此药也用动物骨，是什么动物呢？其实是一种营地下生活的鼯鼠的骨骼。这样说来鼠类骨骼不是也有虎骨的作用吗？但在商业上就不能以鼠来冠名，鼠的名声不好，是不会受到百姓欢迎的。

2. Northwest High Plains Research Centre (in China) and Tong -Ren Tang (an ancient medicine supplier throughout China, which performs their own R&D) co-operated to create a liquor to treat

rheumatism, which has the same effect as Tiger bone liquor. It also uses animal bones, but which animals? Actually, it is a type of underground mole, so doesn't this mean that rodent bones have the same effect? But for commercial purposes you cannot call it a "rodent" product, because people are not receptive to this.

3 再有一个例子，昆明动物所也曾用鼯鼠骨配伍药酒，称“龙骨酒”，说其活血消肿功效比虎骨酒还好。龙骨是什么时候呢？因为配方是保密的，朋友只略透露一点：它是好几种动物骨配制成的，其中有鼠兔骨，是一种草原的兔类，大小及外形像鼠，取名龙骨也是出于商业上的考虑。虎骨酒和龙骨酒我都曾试用过，二者对消肿去痛也未觉有特殊效果。说实在的，贴一张伤痛膏也会有效的。

除了本草和近来记载的羊骨、狗骨、鹿骨、猪骨和上述的鼠类的骨骼外，应还有更多的动物骨可配制类似于虎骨酒的药，并非非用虎骨不可。

3. Another example, Kunming Animal Research Centre has also used mole bones in combination with five herbs and called it "Dragon Bone Liquor". When it comes to reducing inflammation and circulatory effectiveness, it is actually superior. What are dragon bones? Its recipe is a secret, however a friend has told me a little bit. It's a combination of several animal bones, one of which is a "rodent rabbit", which is a type of rabbit of the approximate size and appearance of a rodent. It is also called Dragon Bone out of commercial consideration. I have tried both Tiger bone liquor and dragon bone liquor, both of which did not seem to have any special effects in terms of helping with inflammation and as painkillers.

Other than lamb bones, dog bones, deer bones, pig bones and other rodent-type bones mentioned in Ben-Tsao ("Original Plants") and other collected records, there are many other animal bones which can be paired with white liquor and are similar to Tiger bone liquor. So it is not necessary to use Tiger bone only.

4 从虎骨到豹骨：虎曾遍布全国，它是中国食肉动物中最大最强壮的猛兽，百姓受虎的影响是长期而直接的，所以我们的祖宗尝试药源时首先会考虑到虎，而不会想到狮。其实狮虎是同属动物（*Panthera* 属），为什么不用血缘关系最接近的狮骨呢？除了中国没有狮子外，似乎没有多少道理，但当虎骨供不应求时，中药商会想到体型仅次于虎的豹，最初为金钱豹，这似乎也说得过去，因为豹与虎同属于 *Panthera*，二者是近亲；在虎豹仍感不够的情况下，比豹小一点的云豹骨也用上了，云豹可是另一个属（*Neofelis*），与虎不是近亲，为什么要用它代虎骨呢？大概他们不一定知道它们的血缘关系，不过同样带有一个“豹”字也就算是豹了；后来，猫属的金猫也用上了，为什么用金猫呢？也是有理由的，因为金猫在农村和商品市场上也称豹，根据不同毛色称红春豹，龟纹豹或狸豹、芝麻豹、黑豹等，这样不也带上“豹”字了吗？其骨当然也可代虎骨了，这里并无科学可言。所以能流传至今，无非是人们心理上的需求，对它有所期待，毕竟有酒和药在发挥作用。以上表明，虎骨也不过是骨类的一种而已。

4. From Tiger bones to Leopard bones: Tigers are all over the country, they are the largest and strongest of the wild carnivores in China, their influence on people has been long-term and direct, so our ancestors often considered Tigers and not Lions when they considered various sources of medications. Actually, Tigers and Lions are all "*Pantheras*", so why don't they use the closely related Lion bones? Other than the fact that China doesn't have Lions, there doesn't seem to be any other reason. When Tiger bone supply does not meet demand, these herbal merchants turn to the Leopard, whose body shape is similar to the Tiger. Originally they thought of the "gold coin Leopard", which seems rational because Leopards, like Tigers, are also *Panthera*. Second, they are close relatives. When the supply of Tiger and gold coin Leopards is still too little, then they turn to the Clouded Leopard, which is smaller and not even a *Panthera*, but rather a *Neofelis*. It is not a close

relative of the Tiger, so why do they use it to replace Tiger bones? Maybe they did not know the genetic relationship between those animals and since they are all called and categorized by the “bao” family (similar to *Panthera*) in Chinese, it was sufficient. Later even the “golden cat” of the cat family was used. Why would they use the golden cat? The reason is that the golden cats are also called “bao” in farming villages and commercial markets. According to the colors of its fur, it is also called “red spring bao”, “turtle patterned bao”, “li bao”, “sesame bao” and “black bao”, all carrying the word “bao”, so their bones were used in place of Tiger bones. There is no science here, so how it can be passed down to this day is a result of human psychological need. For them, they have certain expectations of it. After all, there are still effects from the liquor and herbs. As stated above, Tiger bones are only one of many animal bones.

曾有一个单位自己处理了一头虎，将虎骨浸酒，第一次 1000 斤的酒，售给职工和作为礼品赠送；取尽后第二次再加 1000 斤，只出售给“走后门”的熟人，第三次又加入 1000 斤，才公开出售。这就是在利益启动下的开发，自然赚钱不少。试想，浸过三次后的虎骨能渗出了多少成份，这些成份在每斤酒中占有多少，能有多少作用？但只要喝的是有虎骨的酒，心理的感受是特异的。

既然虎骨并无特殊疗效，且有不少代用品，当然不必对国家一类保护动物进行开发了，这种开发即使有点经济效益，也是建立在损害社会效益的基础上的，不值得提倡。

One time I took a Tiger and placed the bones in liquor, the first time using 1,000 “jing” [a measurement less than 1kg] in the liquor and sold the liquor to our employees or gave it away as gifts. The second time, we took another 1,000 “jing” of the same bones and we only sold it to acquaintances with connections. The third time we took the same 1,000 “jing” and sold it to the public. This was motivated by profit and naturally we made a lot of money. Just think about it, after three rounds of soaking, how much essence of the bones is released in the liquor per “jing” and how much effect would it have? However, anyone who drank the Tiger bone liquor felt that it was special.

Since Tiger bone does not have special curing effects and there are many replacements, naturally we do not have to develop captive breeding of this animal, which is one of the most protected by the Chinese government. This kind of “development” may have economic profit, but it is established on something that is harmful to society and we should not promote it.

四 养殖虎的出路

5. Prospects of raising Tigers

既然虎骨药与其他骨类药相比，仅有类似作用和效果，并无独特疗效，其他骨类药完全可以替代虎骨，那就没有必要非用虎骨入药。由此，建议如下：

Since Tiger bone medicine and other types of bone medicines have similar function and effects when compared and have no special curing effect, other bone medications can replace those of Tiger bones. Hence, it is not necessary to use Tiger bones in medications. Therefore, suggestions are as follows:

1 计划养老虎。根据观赏、科普展出科研等为目的限量饲养，为经济效益开发养虎，是以损害社会效益为代价的，得不偿失，不宜提倡。

1. Planned raising of Tigers. For observations, scientific development and research—determine a limited quantity. For economic profit—to raise Tigers, the trade-off is harmful societal effects and the loss is greater than the benefit, so it is not to be promoted.

2. 现有饲养单位的多余虎的出路，部分用于教学科研或陈列；其余的可与外国交换其它动物或作礼物赠送。

2. Now there are already some places raising Tigers, partly to be used for education, science or display. The remainder can be exchanged with other nations for other animals or given as gifts.

3. 主管部门应当机立断，尽快向养虎专业户表明态度。

3. The responsible department should immediately make decisions and state policies regarding Tigers to raisers.

TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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