

Wildlife markets in South China

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Abstract: China is one of the largest consumers of wild animals for food and traditional Chinese medicine in the world. A large volume of illegal trade has been recorded in the primary cities, such as Hong Kong and Guangzhou, but the wildlife markets in secondary Chinese cities have not been investigated. This study was carried out in 7 cities in Guangdong and Guangxi provinces. Wildlife trade data were collected using semi-structured interview, observation, and market survey. The study documented the selling of 97 animal species, >7,000 individuals. The most frequently used animal groups by quantity were reptiles (51%), followed by birds (21%) and mammals (10%). Of the reported species, 23% were threatened, including 1 species critically endangered and 12 species endangered. In this study, there were 19 species observed that are recognized by the Convention on International Trade in Endangered Species (CITES). The results show that the animals originated not only from south China but also Indochina and Southeast Asia. Our survey also verified that Guangzhou and Hong Kong are not the only wildlife markets in South China. A large volume of illegal trade also is occurring in secondary cities in South China.

Key words: Guangdong Province, Guangzhou, Hong Kong, human–wildlife conflicts, illegal trade

EATING WILD ANIMALS has long been a tradition in southern China. The rapid economic growth in China has increased the demand for wild and exotic animals for use as highly valued food, Chinese medicine, and pets. These animals include turtles (Bataguridae, Emydidae), snakes (Colubridae), lizards (Gekkonidae), crocodiles (Crocodylidae), pangolin (Manidae), birds (Emberizidae), and small mammals (Suidae, Viverridae). International and national trades have threatened the wild animal population in China and nearby countries (Corlett 2007, Nijman 2010). Considering the only legal trade markets, there were >13 million live animals exported from Southeast Asia between 2000 and 2007 (Christy 2010). In 2008, Hong Kong Customs and Excise Department (HK-CED) seized endangered animals and plants worth >US\$ 1.2 million.

Guangzhou and Hong Kong are 2 of the richest cities in South China, and their demands for wild animals are huge. Several wildlife markets in Hong Kong (e.g., Mongkok Market) and Guangzhou (e.g., Yuehe Market) make up a large volume of the wildlife trading activities in South China (Cheung and Dudgeon 2006). Many animal species are protected by Convention on International Trade in Endangered Species

of Wild Fauna and Flora (CITES) and China's Wild Animals Protection Law, but they still are found in restaurants, food markets, and pet shops (Dick et al. 1993, Mainka and Mills 1995, Gong et al. 2009, Cheung and Chow 2011).

Local wild animals from reserve forests in Guangdong Province are one of the main sources of wildlife in the markets in South China. Over-hunting and degraded landscapes near both Guangzhou and Hong Kong have reduced both the diversity and number of animals in the wildland (Pei et al. 2010). With the rapid development of highways, hunting and poaching activities have increased in towns in the north of Guangdong Province. Currently, no data are available about wildlife trading activities in these areas.

Several market surveys have been conducted to quantify wildlife trading in South China, but those reports focused on birds and freshwater turtles (Dick et al. 1993, Cheung and Dudgeon 2006, Gong et al. 2009). Importantly, those previous market surveys were mainly conducted in primary cities, such as Guangzhou, Shenzhen, and Hong Kong. Trading activities in other towns in South China are unknown. As both alertness by poachers and stronger enforcement in the major cities



Figure 1. Map shows the area of Guangdong Province (unshaded) and its adjacent provinces in South China. The dark circles show the locations of the 7 secondary cities in the market surveys. The white circles show the 3 primary cities where wildlife trading had been reported.

increase, trading activities of wild mammals and endangered animals may have become more prevalent in these remote towns. The goal of this study was to verify illegal trade activities in towns in the north of Guangdong Province and to investigate the number and species of wild animals involved in those activities.

Methods

This study was carried out in 7 cities and towns in Guangdong and Guangxi provinces (Figure 1). The 6 cities we surveyed in north Guangdong Province are medium-size cities with populations of 0.5 to 3 million people. Nankunshan is a small town located within the Nankunshan National Park and has a population of 3,000 people. This national park also is the closest (~200 km) national park to the city of Guangzhou, and the town was the major vacation spot for local people. One of the activities for tourists in the town is to purchase wildlife for food consumption. Wuzhou in Guangxi Province was once abundant with the Chinese 3-striped box turtle (*Cuora trifasciata*). The city was known as the place of origin of turtle jelly, a substance made from the bottom shell of the box turtle and used medicinally.

The study was conducted in October and November 2008. Prior to each trip, we interviewed local university students who were originally from the study areas to pinpoint the

locations of potential wildlife markets. We conducted the interviews on a voluntary basis. We announced the requests during regular student meetings and personally met with the students who agreed to provide the market information. We visited 39 live animal markets in 7 cities and towns. These markets sell live animals, including poultry, fish, and reptiles, for food use. We had 6 to 8 team members for each visit, including 2 wildlife scientists, 3 to 4 university students, and a local tour guide (driver). Lectures and guided observations on the markets about the Asian turtle conservation problem, turtle identification skills, and survey techniques were given to the students before on-site surveys. All student members involved in this survey had participated in our monthly turtle survey in the city of Guangzhou for ≥ 1 year (Cheung and Chow, 2011). Our team members pretended to be potential buyers and visitors to gather information on the displays (including species, quantities, prices, and origins of wild animals). In markets with a large number of animals or exotic species, 3 teams with ≥ 2 members each visited the markets 10 to 15 minutes apart. Photos were taken and used for identification of species and counting (Figure 2). Our wildlife biologists undertook extensive checking of the species and general estimation of the quantities of the whole market at the same time to cross-

Table 1. Summary of wildlife trading surveys we observed in the 7 cities in Guandong and Guangxi provinces.

Species	Quantities	CR	EN	VU	Threatened	CITES I	CITES II	CITES	NP I	NP II	NP	
Reptile	49	4,728	1	12	8	21	1	18	19	1	3	4
Turtle	28	3,006	1	12	8	21	1	12	13	0	2	2
Lizard	3	309	0	0	0	0	0	1	1	0	1	1
Snake	17	1,412	0	0	0	0	0	4	4	1	0	1
Crocodile	1	1	0	0	0	0	0	1	1	0	0	0
Amphibian	11	783	0	0	0	0	0	1	1	0	1	1
Caudate	3	48	0	0	0	0	0	0	0	0	0	0
Frog	8	735	0	0	0	0	0	1	1	0	1	1
Bird	20	1,424	0	0	1	1	0	0	0	0	1	1
Mammal	10	258	0	0	0	0	0	0	0	1	0	1
Other	7	–	0	0	0	0	0	0	0	0	0	0
Total	97	7,193	1	12	9	22	1	19	20	2	5	7

IUCN Red List categories: CR = critically endangered; EN = endangered; VU = vulnerable; Convention on International Trade in Endangered Species (CITES) categories include CITES I and CITES II; Nationally Protected (NP), species listed as Grade I or Grade II of Law on Protection of Wild Animals of People's Republic of China.

check data for consistency. The data gathered from each team were immediately compared and evaluated for accuracy. Corresponding corrections and amendments were made on the species identification and quantity estimate on site. However, it was not always possible to make exact counts, because large numbers of animals often were packed into nets, cages, or containers. Information about the origin of animals often was unknown. Details on the data collection can be found in our other

publications (Cheung and Dudgeon 2006, Gong et al. 2009, Cheung and Chow 2011).

Results and discussions

We found a variety of exotic and wild animals in the markets, including reptiles, amphibians, birds, mammals, and other wild exotic species (Table 1). Turtles and snakes were the major species sold in the wildlife markets. Approximately 5,000 individual reptiles from 49 species were identified in the

39 markets. Twenty-one species are considered threatened, listed as critically endangered (CR), endangered (EN), or vulnerable (VU). Also, nineteen of them are listed in CITES categories. Notably, many turtle species were not local species in China (Table 2) and probably were illegally imported from other countries. For example, Indochinese box turtles (*Cuora galbinifrons*) and Burmese pythons (*Python molurus*) were found in the wild markets. These wild animals probably originated not only from southern China but also possibly from Indochina and Southeast Asia. Land routes in southwest

Table 2. List of families and genera of turtles we observed in the 7 cities of Guandong and Guangxi provinces.

Bataguridae (13 species)	Emydidae (6 species)
<i>Chinemys reevesii</i>	<i>Chrysemys picta</i>
<i>Cuora amboinensis</i>	<i>Graptemys flavimaculata</i>
<i>Cuora flavomarginata</i>	<i>Graptemys oculifera</i>
<i>Cuora galbinifrons</i>	<i>Pseudemys concinna</i>
<i>Cyclemys dentate</i>	<i>Pseudemys rubriventris</i>
<i>Geoclemys hamiltonii</i>	<i>Trachemys scripta elegans</i>
<i>Geoemyda spengleri</i>	
<i>Malayemys subtrijuga</i>	Pelomedusidae (1 species)
<i>Mauremys mutica</i>	<i>Podocnemis unifilis</i>
<i>Morenia petersi</i>	
<i>Ocadia sinensis</i>	Platysternidae (1 species)
<i>Sacalia bealei</i>	<i>Platysternon megacephalum</i>
<i>Sacalia quadriocellata</i>	
Carettochelyidae (1 species)	Testudinidae (4 species)
<i>Carettochelys insculpta</i>	<i>Geochelone sulcata</i>
	<i>Indotestudo elongata</i>
	<i>Manouria emys</i>
Chelidae (1 species)	<i>Manouria impressa</i>
<i>Chelydra serpentina</i>	

China, especially from Vietnam to Guangxi and Guangdong provinces, are an important means of entry to southern China (Cheung and Dudgeon 2006).

The second largest animal group we observed was birds. Common species were partridges and quails in the family of Phasianidae. They were typically enclosed in cages and displayed outside the shops (Figure 2). Yellow-breasted buntings (*Emberiza aureola*, VU on International Union for Conservation of Nature and Natural Resources [IUCN] RedList) were found in the markets. Frogs were the most common amphibian found in the market, particularly, the Chinese edible frog (*Hoplobatrachus rugulosus*), which is a CITES II and nationally protected II listed species in China. However, it is possible that most of the individuals seen in the markets could be bred from farms. Mammals included wild hogs (*Sus scrofa*), deer (*Cervus nippon*), and masked palm civet (*Paguma larvata*). We believe that most of the mammals were wild-caught because tooth-like wounds made by hunting traps were observed on their feet. The “others” categories in Table 1 consisted of insects and terrestrial arthropods, including scorpions (Buthidae), centipedes (Scolopendridae), ants (Formicidae), wasps (Vespidae), and diving beetles (Dytiscidae).

Few notable species were found in this study (Table 3). For example, Indochinese box turtle (*Cuora galbinifrons*) and Burmese phtyon (*Python molurus*) were found in the wild markets, showing some of the wild animals originated not only from southern China, but also possibly from Indochina and Southeast Asia. Our surveys also confirmed that significant numbers of local wild animals were poached and sold in the markets, although some of them are not considered endangered. In particular, masked palm civets (*Paguma larvata*) were sold in the market. The trading of these species may



Figure 2. Snapshots of the black market in Qiao Xi Market (Huizhou), China, showing bamboo rats (*Rhizomys sinensis*), wild hogs (*Sus scrofa*), and masked palm civets (*Paguma larvata*).

violate the policy of local government because of the outbreak of severe acute respiratory syndrome in 2003.

In sum, the study documented >7,000 individuals from 97 animal species. Of the reported species, 23% were threatened, endangered, or critically endangered. Our survey confirmed that wildlife animal trading activities occurred in remote towns in Guangdong Province. Given the number of species and large areas involved in wildlife trading, these illegal activities would have significant impacts on regional ecosystems and the conservation of threatened species. Further, these markets increase the risk of zoonoses

or wildlife disease because many animals are crowded together. To prevent wildlife trading in China, law enforcement should conduct thorough and frequent inspections of live-animal markets. Location education also is important because most of the wild animals are sold for use as pets or for nonessential food uses.

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Literature cited

- Cheung, S. M., and A. T. Chow. 2011. Project-based learning: a student investigation of the turtle trade in Guangzhou, People's Republic of China. *Journal of Biological Education* 45:68–76.
- Cheung, S. M., and D. Dudgeon. 2006. Quantifying the Asian turtle crisis: market surveys in southern China, 2000–2003. *Aquatic Conservation: Marine and Freshwater Ecosystems* 16:751–770.
- Christy, B. 2010. Asia's wildlife trade. *National Geographic Magazine* 217(1):78–106.
- Corlett, R. T. 2007. The impact of hunting on the mammalian fauna of tropical Asian forests. *Biotropica* 9:292–303.
- Dick, D., A., Jones, D. McNiven, K. Morton, and H. Peeters. 1993. The wild bird trade in Hong Kong and mainland China. *Vogelbescherming*, Netherlands.
- Gong, S. P., A. T. Chow, J. J. Fong, and H. T. Shi. 2009. The chelonian trade in the largest pet market in China: scale, scope and impact on turtle conservation. *Oryx* 43:213–216.
- HK-CED. 2008. Hong Kong Customs and Excise Department—departmental reviews. Hong Kong Customs and Excise Department, Hong Kong, People's Republic of China.
- Mainka, S. A., and J. A. Mills. 1995. Wildlife and traditional Chinese medicine—supply and demand for wildlife species. *Journal of Zoo and Wildlife Medicine* 26:193–200.
- Nijman, V. 2010. An overview of international wildlife trade from Southeast Asia. *Biodiversity and Conservation* 19:1101–1111.
- Pei, K. J. C., Y. C. Lai, R. T. Corlett, and K. Y. Suen. 2010. The larger mammal fauna of Hong Kong: species survival in a highly degraded landscape. *Zoological Studies* 49:253–264.

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