

An Overview of Pangolin Trade in China

Ling Xu, Jing Guan, Wilson Lau and Yu Xiao

KEY points:

- All Asian and African pangolin species are listed in CITES Appendix II, and a zero export quota for the international commercial trade of the four Asian pangolin species is in place;
- China has regulated the use of pangolin scales. Since 2007, pangolin scales can only be used for clinical applications at designated hospitals and manufacturing of Chinese patented medicines. During the 2008-2015 period, the average annual legal consumption of pangolin scales in China was 26 600 kg;
- In June/July 2016, 35% of animal medicine wholesalers, 62% of TCM retail shops, and 153 online advertisements were found to be illegally selling pangolin scales. Most illegal pangolin scales sold at markets in China were from South-east Asian countries, followed by African countries;
- Between 2007 and 2016, there were 209 pangolin seizures in China; 2405 live pangolins, 11 419 dead pangolins and 34 946 kg of scales were seized. Amongst these, Malaysia, Indonesia and Viet Nam were major source countries for whole pangolins; while main sources for smuggled pangolin scales were Nigeria, Cameroon and Myanmar.



INTRODUCTION AND METHODS

All pangolin species (*Manis* spp.) have been included in CITES Appendix II since 1975 and a “zero quota” has been in place since 2000 for trade in the Asian pangolin species: *M. crassicaudata*, *M. pentadactyla*, *M. javanica* and *M. culionensis*. This effectively bans all international commercial trade of Asian pangolins. Despite the trade restrictions, more than a million pangolins (including Asian and African species) have been poached and illegally traded globally over the past decade (IUCN, 2014) to satisfy demand from consumers in Asia, particularly in China.

Throughout Chinese history, pangolins have been viewed as an important source of medicine and food (Wu *et al.*, 2004; Wu and Ma, 2007). Pangolin scales, combined with other materials, are used in traditional Chinese medicine (TCM) to promote blood circulation, stimulate lactation, disperse swelling and expel pus, while pangolin meat is consumed as a luxury food item, often as a display of social status and hospitality (Zhang and Yin, 2014). *M. pentadactyla* is a national second-class protected species listed in China’s Wild Animal Protection Law. The other three Asian pangolin species and all four African pangolin species (*M. gigantea*, *M. tricuspis*, *M. temminckii* and *M. tetradactyla*) have been classified as national second-class protected species in order to improve management and enforcement of their trade (SFA, 1993). According to Article 22 of China’s Wild Animal Protection Law issued in 1988, selling and purchasing national protected wild animals and their products (including national first/second-class protected species) is prohibited. However, if it is used for the purposes of scientific research, captive breeding, exhibition and other special cases (e.g. use in TCM), the sale, purchase and use of national second-protected animals and their products (e.g. pangolins and their products) needs to be approved by provincial wildlife management departments. Eating pangolins is not within these exceptions and has therefore been completely prohibited since the law was in effect in 1989. However, the trade and use of pangolin scales continue in China, with the issuing of a special marking system established by the State Forestry Administration (SFA) in 2007 to regulate their medicinal use (SFA, 2007). This system allows pangolin scales from verified stockpiles of SFA or other legal sources, such as legal imports from African countries, to be directly used in ~700 licensed hospitals and in ~70 patented medicines manufactured by authorized pharmaceutical companies only (SFA, 2008; Hu, 2016). It is illegal for both animal medicine wholesalers and TCM retailers to offer pangolin scales for sale. However, there is a lack of evidence on how effective the regulations are in preventing illegal trade in pangolin parts. Research for the current briefing paper provides fundamental information and analyses of the pangolin trade in China, in order to assess the need

and urgency for enacting stricter trade regulations and strengthening relevant law enforcement at the domestic and international levels.

A rapid assessment of the domestic pangolin market in mainland China was carried out in June and July 2016 and involved surveys of:

- Physical markets:
 - 209 stalls that sold animal products in eight major TCM wholesale markets;
 - 110 retail TCM shops in 19 cities;
 - 35 220 stalls in 97 collectibles markets¹; and
 - 51 restaurants in 12 cities.
- Online offers for sale on 39 China-based e-commerce websites.

A survey method similar to that used by TRAFFIC in other wildlife products around the world was replicated here—the surveying team posed as potential and interested buyers, notes being taken using a mobile phone or Dictaphone, and photos taken wherever possible. No pangolin product was purchased as part of the survey. The specific product type, price, quantity and source were recorded. Additional information was also collected, including traders’ knowledge/perception/awareness of the status of the Chinese pangolin market and regulations concerning legal/illegal trade in pangolin products, and contacts for the revisiting in future.

In addition, China’s current role in international trade in pangolin products, and the legal basis for China pangolin trade, were reviewed through:

- Analysis of CITES trade data on import and export of pangolins and their products from China during 2001–2014;
- Media reports of pangolin seizures in China during 2007–2016, including mainland China, Hong Kong SAR, Macao SAR and Taiwan;
- Available literature /guidance on relevant legislation; and
- Consultations with Chinese governmental officers and experts for additional information and verification.

KEY FINDINGS

Physical market survey results

The survey found that the major types of pangolin products on sale were raw scales, processed scales, scale powder and scale/nail carvings. In total, 74 animal medicine wholesalers and 67 TCM retail shops were found to offer pangolin scales for sale, and 13 shops for collectibles were found to sell pangolin scale/nail carvings. Compared with a survey conducted by TRAFFIC ten years ago (Xu, 2009), the percentage of TCM retail shops selling pangolin scales decreased from 82% in 2006/2007 to 62% in 2016. Meanwhile, the percentage of stalls in TCM wholesale markets selling scales increased from 12.5% in 2006/2007 to 35% in 2016, indicating that the illegal trade of pangolin scales is still on-going in China’s TCM markets. However, a positive change has been seen in terms of the consumption of pangolin meat. Only two (2%) restaurants surveyed clearly stated that pangolin meat was offered while 9 (18%) restaurants had pangolin meat for sale in 2006/2007, and “pangolin” or “ground dragon” was never even identified in restaurants outside of Guangdong, Guangxi and Yunnan



Processed pangolin scales for sale in retail TCM shop

¹ Markets mostly selling antique and craft products.

provinces in 2016. There were still a few law enforcement blind spots, for instance, at border villages that provide favourable conditions for smuggling, such as Daluo, in Yunnan Province, which neighbours Mong La, Special Region 4 in Myanmar, a noted hotspot of illegal wildlife trade (Nijman *et al.*, 2016). Eating pangolins is also quite common, according to information shared by local taxi drivers in Xishuangbanna, Yunnan Province.

According to the price data collected during the survey, the average price of processed scales in TCM wholesale markets was USD²534±138/kg (n=35), while that of raw scales was USD501±155/kg (n=37). Processed scales were slightly more expensive than raw scales due to the additional cost of processing. TCM retail shops only offered processed scales for sale, with an average price of USD984±303/kg (n=67), apparently higher than TCM wholesale markets. Compared to the prices from TRAFFIC's 2006/2007 surveys, where processed scales were selling for USD132/kg at wholesale markets and USD160/kg at retail markets, the 2016 prices have increased almost four-fold at wholesale markets and six-fold at retail markets.

When asked about the source of the scales, most traders refused to answer or answered evasively, clearly illustrating their knowledge of the laws and the illegality of the trade. Only 34% of animal medicine wholesalers with scales for sale were willing to reveal their source—pangolin scales sourced from overseas were mainly claimed to be from Southeast Asian countries, including Myanmar and Viet Nam, as well as African countries. Scales from domestic sources were mainly from Guangxi and Yunnan provinces (which border Viet Nam and Myanmar respectively). However, according to traders in Guangxi, Viet Nam was merely a transit country for pangolin scales, and a lot of scales were in fact sourced from Pakistan. 18% of TCM retail shops with scales for sale revealed that scales were bought from pharmaceutical companies, except for one shop that sourced them from Viet Nam. Since pangolin scales are only allowed to be sold in designated TCM hospitals and to be manufactured into patented medicine by authorized pharmaceutical companies, TCM retail shops should not legally be able to source pangolin scales from pharmaceutical companies.



Raw pangolin scales for sale in TCM wholesale market

Given that China has prohibited the sale of pangolin scales in non-designated hospitals since 2007, it is surprising that traders in TCM markets have shown varying levels of understanding about the legality of selling pangolin scales. 34% of surveyed traders (71 out of 209) described them as “prohibited”, “illegal” and “risky” after realizing the researchers’ interests in pangolin scales. Only 15 TCM retail shops (14%) with scales for sale proactively shared information, including the illegality of pangolin scales. This was far lower than traders in the TCM wholesale markets (34%). This could be an indication of selective enforcement by market supervisory and management personnel, as well as a misperception amongst TCM practitioners/consumers. The majority belief seems to be that trade in pangolin scales at TCM wholesale markets is driven by profit-making and should therefore be curtailed, while its use in TCM retail shops as prescriptive medicine is acceptable, and can be tolerated, because it serves to cure sickness and save lives. Regardless, under the current legal framework, it is illegal for both animal medicine wholesalers and TCM retailers to offer pangolin scales for sale.

Online survey findings

Two types of pangolin products are offered for sale online—scales for medicinal use and carved scales/nails (or scales to be carved). Small amounts of pangolin meat and live pangolins were also identified for sale online. From the 39 surveyed websites, researchers recorded 153 advertisements for pangolin scales in total, which were published by 94 traders on six internet platforms in June 2016. One advertisement for pangolin meat and two advertisements for live pangolins were also recorded. Of all online advertisements, 88% were found on a popular online retail platform (called “Website A” in this report) and a famous TCM market website (called “Website B” in this report).

Of the 50 advertisements on Website B, source countries for the pangolin scales advertised included Viet

² A conversion rate of US Dollar (USD) 1 = 6.68 Chinese Renminbi (RMB) / 1 RMB = 0.15 USD (<https://www.oanda.com/currency/converter/> accessed on 25 July 2016) was used.



Raw pangolin scales for sale on a TCM website

scales shown under the categories “Medicine”, “Animal” and “others”. Advertisements for pangolin scales included phrases such as “African pangolin scales on offer”, “Myanmar wild pangolins on offer”, “rare and valuable medicine ingredients Pangolin scales on offer”, etc. Besides pangolin scales, researchers also came across one advertisement for pangolin meat (USD180/kg) and two advertisements for pangolin for captive breeding purposes.

Advertisements for pangolin scales on Website A had titles containing terms such as “resin”, “emulation” or “high emulation”, when researchers entered “pangolin scales” and “skin scraping scales” in the search bar. However, when these web link swere opened, the advertisements turned out to be genuine pangolin scales, indicated by the picture and/or product description provided. By doing this, traders were able to evade Website A’s security screening, which has continuously been scaling up its efforts to crack down on wildlife cybercrimes in recent years. If traders directly advertised “pangolin scales” on this website, its security system would have identified a violation, and the advertisement would be filtered, reported, and ultimately removed. The accounts of serious violators would also be closed.

CITES trade in pangolins

Trade data records from the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC)’s CITES Trade Database, pertaining to China’s import and export of pangolins in the period 2001–2014, were analysed.

According to importer data, China reported nine imports involving pangolins between 2001 and 2014, including:

- 1) three records in 2010 and 2012 totalling 2300 kg of *M. javanica* imported from Singapore for commercial purposes (where Singapore is a re-export country of pangolin scales, and traded with an export certificate obtained before 2000, when the zero quota came into effect);
- 2) two records in 2002 of products containing scales and ten whole skins of *M. javanica* imported from Japan for commercial purposes;
- 3) two records in 2014 totalling 3948 kg of scales from Uganda and Democratic Republic of the Congo for commercial purposes;
- 4) two records in 2011 and 2014 for the import of pangolin specimens and hunting trophies from an unidentified country and South Africa for educational purposes.

China’s import data had fewer import records compared to exporters’ data between 2001 and 2014. The following records from exporter data were not reported in China’s import data:

- 1) in 2009, Singapore re-exported 1000 kg of *M. javanica* scales to China for commercial purposes;
- 2) during 2012 to 2013, the U.S. exported 112 specimens of *M. javanica* and *M. pentadactyla* to China for scientific research purposes;
- 3) in 2013, Togo exported 30 kg of *M. gigantea* scales to China for commercial purposes.

Nam (26%), African countries (16%: two advertisements named the sources as Nigeria and Equatorial Guinea), Thailand (10%) as well as Myanmar and Indonesia. Within China, scales were mainly sourced from Guangxi and Yunnan provinces (55% in total), followed by Shaanxi, Guangdong, Guizhou and Hebei provinces. The average price on Website B was USD427±150/kg (n=56), which is lower than prices at physical TCM wholesale markets (by USD74-107/kg), and less than half that of prices in TCM retail shops. When entering “pangolin” into the search box on the website, researchers found various advertisements for pangolin

Reasons for the discrepancies between importer and exporter data could possibly be because exporting and importing countries were reporting the same transactions in different years, or that authorities in the exporting country had approved a given amount, issued an export permit and reported this amount to the CITES Trade Database, which differed from the actual traded amount, as reported by the importing country; or that part of the importing country's data were missing.

Between 2001 and 2014, only two pangolin records were reported in China's export data, namely a record of the trade in two live *M. pentadactyla* to Japan for "zoo" display in 2003; and another record of one specimen of *M. pentadactyla* to South Korea for "education" purposes in 2010.

In contrast, importers' records totalled 50 exports from China. One record was filtered out, since it was reported by both the exporter and the importer in different years, leaving a revised total of 49 records of pangolin exports from China.

Clearly further review and investigation is needed to identify the reasons for the significant discrepancy between importer and exporter data. According to CITES importer data, pangolins imported from China were mainly composed of derivatives (31 records, 63%), followed by medicine (16%) and scales (14%). There was only one record each for live pangolins, pangolin scale powder and specimens. According to the information on product packaging, the majority (95% of records) of pangolin derivatives and medicine traded with CITES certificates were made from seized pangolin scales, which highlights the fact that seized pangolin scales in China are used in the legal trade for medicinal production.

China pangolin seizures

Incomplete statistics based on seizure data indicate that law enforcement agencies (including mainland China, Hong Kong SAR, Macao SAR and Taiwan) made 209 seizures involving pangolins in the period 2007–2016 (as of 18 August 2016). Fifty-five seizures occurred between 2007 and 2011, i.e. on average 11 cases per year (± 3.94). The period 2012–2016 had 154 seizure cases, i.e. on average 30.8 cases per year (± 6.38), an almost three-fold increase on the previous five-year period. This rise in the number of cases may be explained by an increase in illegal trade and market demand for pangolin scales on the one hand, and on the other, improvements in the capacity of China's law enforcement agencies, as well as improved transparency of seizure reports and reporting interest by the media.

Seizures reported in the media between 2001 and 2014 involved a total of 2406 live pangolins, 11 419 dead pangolins and 34 946 kg of scales (including 19 398 kg seized in Hong Kong SAR). Using the conversion model of Zhou *et al.* (2012)³, 34 946 kg of scales equates to 74 832 pangolins.

Based on all available information about the known sources of pangolin seizures, the three largest source countries (by number of cases) were Viet Nam (52 cases, 25%) and Myanmar (21 cases, 10%) in Southeast Asia, and Nigeria (8 cases, 4%) in Africa. However, when considering the number of pangolin individuals and scales confiscated, focusing on the 15 largest seizure cases (>1000 individuals and >1000 kg of scales), Malaysia, Indonesia and Viet Nam were revealed as the major source countries for dead pangolins, while the top source countries for smuggled pangolin scales were Nigeria (11 300 kg), followed by Cameroon (6340 kg) and Myanmar (2292.61 kg). Major destinations in China for the illegal trade in pangolins, according to seizure data, were Guangdong, Guangxi and Yunnan provinces, as well as Hong Kong SAR.

³ The conversion standard to convert dry scales of mixed Chinese pangolin and Java pangolin is 466.99g/individual. The standard is adopted by this report, considering the lack of description on particular species from public case information.

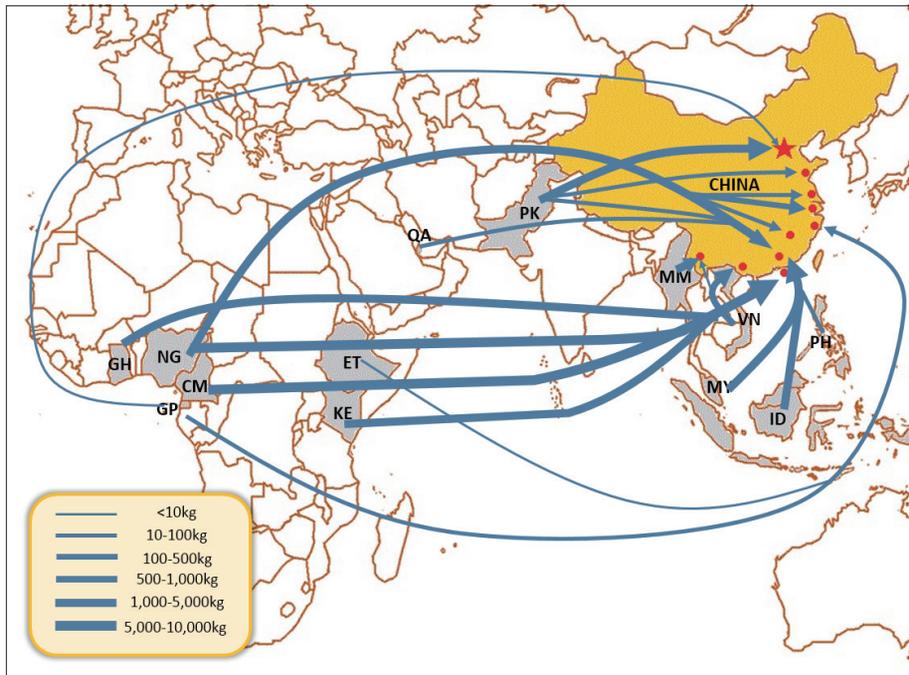


Figure 1: Major smuggling routes for pangolin scales based on seizures between 2007–2016 ^{4,5}

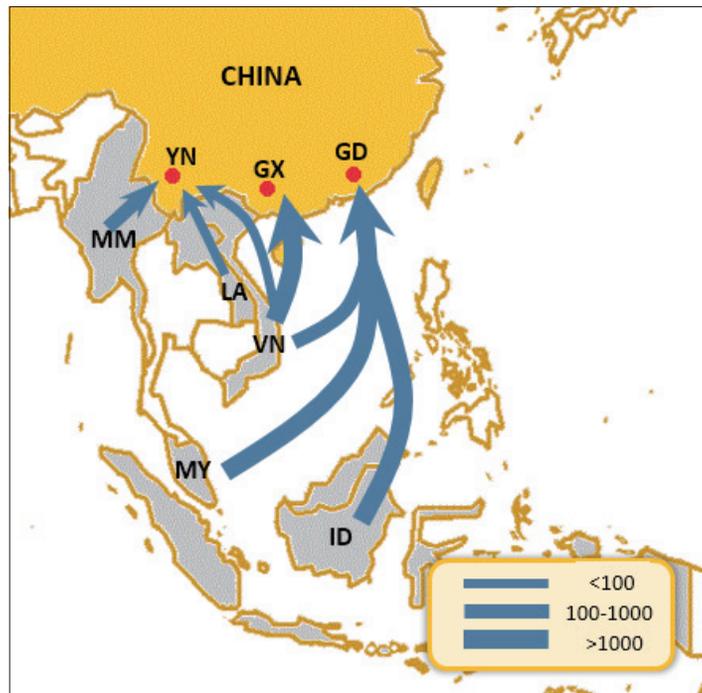


Figure 2: Smuggling routes from Southeast Asia for whole pangolins based on seizures between 2007-2016 ^{6,7}

⁴ CM-Cameroon; ET-Ethiopia; ID-Indonesia; GH-Ghana; GQ-Equatorial Guinea; KE-Kenya; MM-Myanmar; MY-Malaysia; NG-Nigeria; PK-Pakistan; PH-The Philippines; QA-Qatar; VN-Vietnam.

⁵ Source: TRAFFIC

⁶ GD-Guangdong Province (CN); GX-Guangxi Province (CN); LA-Laos; YN-Yunnan

⁷ Source: TRAFFIC

From past seizure cases, smuggling methods varied depending on the type and amount of pangolin contraband involved, or on the location of the seizure. Small amounts of pangolin scales were typically carried in luggage and brought through the green “nothing to declare” Customs channel. When scales were sent by airmail, they tended to be declared as “nuts” or other items and were detected via x-ray checks. For large shipments derived from further afield (e.g. from Africa), they would typically be shipped as marine cargo and declared as “timber”, “recycled items” or other items, and hidden or coming led with other goods. For products smuggled from Southeast Asia or Hong Kong SAR into Guangdong Province, the most typical means of transportation was by steel/wooden fishing boat or speedboats.

Moving pangolin contraband within China often involved the use of long-distance public buses, private cars and motorcycles, or via courier and logistics companies. On private transport or public buses, smuggled goods were uncovered through regular security checks and, in a few instances, discovered during inspection of a traffic accident. Detection of smuggled pangolin items sent via courier or other logistics services were primarily based on intelligence information.

The handling of seized live pangolins differed according to the condition of the confiscated animals. Information available from seizure cases, government agencies and public data online suggest that healthy live pangolins were generally set free or taken up by scientific research institutions. In many cases, however, live pangolins have been found to have been injected with antibiotics or hormones, in order to maintain their health during transportation. Pangolins have also been found to be fed with large amounts of gypsum powder and/or wild yam powder to increase their weight artificially. As a result, many of the smuggled pangolins die soon after they are seized. In China, these dead pangolins are subsequently euthanized.

Seized pangolin scales were often kept by enforcement departments, instead of being handed to forestry authorities, although a 2006 regulation mandates the transfer of confiscated wildlife products to wildlife administration departments (The State Council, 2006). Research has shown that some confiscated scales have been sold at auctions in the past. For example, it is known from public trade information from Guangdong Huizhou City Public Resources Trade Center that an auction lot titled “electronic devices and pangolin scales seized by local anti-smuggling office”, with a reserve price of USD189 668, was eventually sold for USD240 566 (Deal No. GJB2013-64)⁸. The Hong Kong SAR Government destroys all seized pangolin scales.

Legal consumption of pangolin scales

In November 2007, China issued *A Notice on Enhancing the Protection on Resources of Saiga Antelope, Pangolin and Rare Snake, as well as the Regulating on their Products for Medicine Use* (hereinafter referred to as “the Notice”), requiring pangolin scales only to be used for clinical applications at designated hospitals, and for the manufacturing of Chinese patented medicines. After the Notice was issued, SFA organized an expert consultation, deciding to allow annual domestic consumption of pangolin scales within a threshold of ~25 000 kg, of which 70% can be made into decocted products, and 30% made into patented medicines (Yin and Meng, 2013).

The average annual pangolin scale consumption was around 26 600 kg, during the period 2008–2015 (Hu, 2016; SFA, 2008; SFA, 2009; SFA, 2010; SFA, 2011; SFA, 2012; SFA, 2013; SFA, 2014). Currently 209 medical companies have been approved to produce 66 different kinds of Chinese patented medicine containing pangolin scales (Hu, 2016). At present, there are no official, publicly available data on stockpiles of pangolin scales in China. Given that there are no successful conservation breeding programmes for pangolins, and with the depletion of wild pangolin resources, all provinces in China have stopped issuing permits for the hunting of pangolins in the wild. Legal use and consumption of pangolins thus relies on the remaining stockpiles that were verified by SFA before the Notice was issued in 2007, which should have reduced considerably by now, after ten years without replenishment. Even if all confiscated pangolin scales (15 548 kg in mainland China since 2007) are included in the legal stock mix, it is likely that current consumption levels would still exceed available stocks. Indeed, the amount of confiscated pangolins could also be much larger, especially if they were not reported publicly in the media and therefore not included in the tally in this briefing.

⁸ <http://zwgk.huizhou.gov.cn/publicfiles/business/htmlfiles/0341/4.5/201401/264114.html>

Legal imports of pangolin scales from range countries could also be a key source for building on available stockpiles and to meet the current demand in China's TCM market. According to UNEP-WCMC's CITES trade data, China imported 6248 kg of scales during 2001–2014 (2015 and 2016 CITES data were not yet available), which is still much less than the average recorded official consumption levels (26 600 kg, between 2008–2015). The Department of Forestry in Guangdong Province gave permission for Luoding Chengshan Trade Co., Ltd to import 500 kg of *M. tricuspis* scales from the Democratic Republic of the Congo in 2015⁹ and 1000 kg of *M. gigantea* from Uganda in 2016¹⁰. This shows that Chinese companies are able to continue importing pangolin scales from African countries, at least in the recent two years. Meanwhile, the surveys conducted for this briefing paper found illegal pangolin scales for sale at TCM wholesale markets, TCM retail shops and online platforms, providing evidence that pangolin scales from illegal sources are being openly sold in China.

RECOMMENDATIONS

1. Despite all pangolin species being listed in CITES Appendix II, and with a zero quota for Asian pangolin species, illegal trade appears to be continuing unabated. Parties to CITES CoP17 should consider supporting the proposed inclusion of all pangolin species in CITES Appendix I, which could greatly enhance efforts to safeguard pangolins by elevating international protection for these species and associated regulatory control mechanisms. However, this can only happen if national legislation in both source and destination countries ratify this and impose higher fines and other punitive measures for illegal trade in Appendix I-listed species;
2. A global pangolin seizure database should be established and maintained by TRAFFIC, so that contributions can be shared by species, source, transit and destination countries along the supply chain, enabling a better understanding of trade patterns and the mapping of trafficking routes and methods, and species mostly effected. This would then help enable more targeted and effective enforcement and management actions to be developed to combat the illegal pangolin trade;
3. With its experience in wildlife enforcement, the Chinese government is encouraged to provide support and build capacity in pangolin range/transit countries to improve their ability to combat illegal pangolin trafficking;
4. The Chinese government should proactively follow-up with commitments made during the Kasane Summit and the Forum on China-Africa Cooperation (FOCAC) Johannesburg Action Plan and actively collaborate with its counterparts in pangolin source and transit countries in Asia and Africa to take joint international enforcement actions against pangolin trafficking;
5. The Chinese government should upgrade *Manis pentadactylato* be a national first-class protected species in China. Management of the trade and use of this, and the other seven, pangolin species should be strengthened at the national level;
6. Discrepancies in reported CITES trade data between importing and exporting countries from 2001 onwards should be examined and clarified with both importers and exporters;
7. The dynamics of China's pangolin scale stockpiles should be made more transparent by the SFA to the public. Stricter measures, such as the establishment of an effective tracking system to monitor the flow of pangolin products and rate of consumption at each authorized TCM manufacturer should be adopted, so as to prevent illegally-sourced pangolin products from entering the legal markets;
8. In collaboration with enforcement agencies, TRAFFIC should develop systematic and comprehensive surveys to monitor the sale of pangolin products in both physical and online markets in China periodically, in order to prevent illegal trade on these platforms to proliferate;
9. TRAFFIC will encourage e-commerce companies to conduct further research and develop innovative approaches to prevent illegal online trade in pangolin scales and other products in the future;
10. The Chinese government should take actions to remove or reduce the use of pangolin scales in TCM, including the development of alternative substitutes, activities to drive consumer behaviour change, and raise public awareness in China about pangolin conservation.

⁹ <https://www.gd.gov.cn/index.php?controller=front&action=xzxkview&id=214>

¹⁰ <https://www.gd.gov.cn/index.php?controller=front&action=xzxkview&id=241>

ACKNOWLEDGEMENTS

The authors thank TRAFFIC colleagues, especially Yannick Kuehl, Chris Shepherd, Roland Melisch, Richard Thomas, Fei Zhou, Sammi Li and Julie Gray for the ongoing support provided and for their reviews. The authors also thank Heather Sohl from WWF UK, and Susie Watts, Christina Vallianos and Michelle Zhang from WildAid for external expert reviews and Chunmei Hu from Endangered Species Fund of China Biodiversity Conservation and Green Development Foundation for information provided on legal consumption of pangolin scales.

Preparation and implementation of this report was made possible with funding support from WWF UK and WildAid.

REFERENCES

- IUCN. (2014). *Eating pangolins to extinction*. IUCN. Gland, Switzerland. <https://www.iucn.org/content/eating-pangolins-extinction>. 29 July.
- Hu, C.M. (2016). Overview of big data for pangolin: *When will the crazy utilization of pangolin stop?* A report prepared by Endangered Species Fund of China Biodiversity Conservation and Green Development Foundation July.
- Nijman, V., Zhang, M.X. and Shepherd, C.R. (2016). Pangolin trade in the Mong La wildlife market and the role of Myanmar in the smuggling of pangolins into China. *Global Ecology and Conservation*. Vol. 5, pp. 118-126.
- SFA. (1993). *A notice on verifying some endangered wild animals as China's national protected species* [in Chinese]. <http://www.arq.gov.cn/Article/flfg/jjf/nlrzyhjbh/200701/8163.html>. 14 April.
- SFA. (2007). *A notice on enhancing the protection on resources of saiga antelope, pangolin and rare snake, as well as the regulating on their products for medicine use* (Linhufa[2007] No.242) [in Chinese]. <http://www.forestry.gov.cn/main/4818/content-796751.html>. 12 November.
- SFA. (2008). *No. 15 notice of SFA in 2008* [in Chinese]. <http://www.forestry.gov.cn/portal/zfs/s/799/content-105928.html>. 28 October.
- SFA. (2008). *Notice on Consumption Rate of Pangolin Scales and Rare Snakes in 2008-2009* [in Chinese]. <http://www.forestry.gov.cn/main/4818/content-796975.html>. 27 November.
- SFA. (2009). *Notice on Consumption Rate of Pangolin Scales and Rare Snakes in 2009-2010* [in Chinese]. <http://www.forestry.gov.cn/zrbh/1472/content-885617.html>. 10 September.
- SFA. (2010). *Notice on Consumption Rate of Pangolin Scales in 2010-2011* [in Chinese]. <http://www.qikan.com.cn/article/glgb20100404.html>. 26 September.
- SFA. (2011). *Notice on Consumption Rate of Pangolin Scales in 2011-2012* [in Chinese]. <http://www.forestry.gov.cn/main/4818/content-797383.html>. 10 August.
- SFA. (2012). *Notice on Consumption Rate of Pangolin Scales in 2012-2013* [in Chinese]. <http://www.forestry.gov.cn/main/4818/content-797353.html>. 19 September.
- SFA. (2013). *Notice on Consumption Rate of Pangolin Scales in 2013-2014* [in Chinese]. <http://www.forestry.gov.cn/zrbh/1472/content-886211.html>. 18 October.
- SFA. (2014). *Notice on Consumption Rate of Pangolin Scales in 2014-2015* [in Chinese]. http://www.fjforestry.gov.cn/upload/wb_user/ouyn/国家林业局关于下达2014-2015年度库存穿山甲片原料年度消耗控制量的通知.pdf. 19 December.

- The State Council. (2006). *Regulations of the People's Republic of China on the Administration of the Import and Export of Endangered Wild Animals and Plants* [in Chinese]. http://www.forestry.gov.cn/Zhuanti/content_sbdzt/566707.html. 29 April.
- Wu, S.B., Liu, N.F., Zhang, Y.M. and Ma, G.Z. (2004). Assessment of threatened status of Chinese Pangolin (*Manis pentadactyla*). *Chin. J. App. Env. Biol.* 10, 456–461.
- Wu, S.B. and Ma, G.Z. (2007). The status and conservation of pangolins in China. *TRAFFIC East Asia Newsletter* 4, 1–5.
- Xu, L. (2009). *The Pangolin Trade in China*. In Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia, 30 June-2 July 2008, Singapore Zoo, Singapore. TRAFFIC Southeast Asia, Petaling Jaya, Selangor.
- Yin, F. and Meng, M. (2013). The sustainable use and conservation of medicinal endangered species. *China Agriculture Press*. pp. 58-67.
- Zhang, L. and Yin, F. (2014). Wildlife consumption and conservation awareness in China: a long way to go. *Biodivers. Conserv.* 23, 2371–2381.
- Zhou, Z.M., Zhao, H., Zhang Z.X., Wang, Z. H. and Wang, H. (2012). Allometry of scales in Chinese pangolins (*Manis pentadactyla*) and Malayan pangolins (*Manis javanica*) and application in judicial expertise. *Zoological Research*, 33(3), 271-275.

TRAFFIC, the wildlife trade monitoring network, is the leading non-governmental organization working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.

For further information contact:

TRAFFIC
Headquarters Office
David Attenborough Building
Pembroke Street
Cambridge CB2 3QZ
UK

Telephone: (44) (0) 1223 277427
E-mail: traffic@traffic.org
Website: www.traffic.org

UK Registered Charity No. 1076722,
Registered Limited Company No. 3785518.



WILDAID

