Wildlife
Smoke and Mirrors
China’s complicity in the global illegal pangolin trade

October 2020
Above: 12.7 tonnes of pangolin scales seized by authorities in Singapore in April 2019. This was the second of two seizures in the same month totaling 25.6 tonnes. Both shipments were en-route to Vietnam from Nigeria.

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About EIA

We investigate and campaign against environmental crime and abuse. Our undercover investigations expose transnational wildlife crime, with a focus on elephants and tigers, and forest crimes such as illegal logging and deforestation for cash crops like palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we reduce the impact of climate change by campaigning to eliminate powerful refrigerant greenhouse gases, exposing related illicit trade and improving energy efficiency in the cooling sector.

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Summary

The world’s eight pangolin species are experiencing catastrophic levels of poaching and trafficking to feed demand for their scales, meat and other body parts. In 2016, the global community agreed to make the international commercial trade in pangolins and their parts and derivatives illegal.

In recent years, Chinese law enforcement authorities have demonstrated the capability to disrupt the transnational trafficking of pangolin scales by organised crime groups. This progress is undermined by the fact that the Chinese Government continues to permit pharmaceutical companies and hospitals to commercially produce and sell traditional Chinese medicine (TCM) products containing pangolin scales.

In this report, EIA exposes how a fundamentally flawed stockpile and TCM product certification system run by the Chinese Government is used by at least 56 pharmaceutical companies to produce a minimum of 64 commercially available medicines containing pangolin scales. We find that this regulatory system is convoluted and lacks transparency and traceability, making it highly susceptible to abuse by pangolin traffickers. We document how the 2020 edition of the TCM pharmacopoeia continues to list pangolin scales as an ingredient in eight patent medicines and that China’s national medicine insurance scheme continues to cover pangolin scale medicine.

We make specific policy and enforcement recommendations at the end of the report, including the need for the Chinese Government to fully prohibit the acquisition, sale and possession, including for medicinal purposes, of all parts and products of pangolins and other globally threatened species, including those from captive-bred sources.

Above: Black-bellied pangolin (Phataginus tetradactyla) in Dzanga-Sangha Protected Area, Central African Republic. This species is listed as Vulnerable on the IUCN Red List.
Introduction

China is the primary destination for the vast quantities of pangolin scales trafficked internationally every year from across Asia and Africa by transnational criminal networks.

In 2016, the global community agreed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) that all commercial international trade in the eight pangolin species would be made illegal. Despite this, the Chinese Government continues to permit pharmaceutical companies and hospitals to trade in traditional Chinese medicines (TCM) containing pangolin scales.

Over the past 10 years, there has been a seemingly endless and growing number of media reports on the many tonnes of pangolin scales seized from illegal trade around the world. It is estimated that the equivalent of 745,000 pangolins have been trafficked to China globally every year. It is estimated that the equivalent of 745,000 pangolins have been trafficked to China every year. This report reveals how the Chinese Government is complicit in perpetuating global demand for pangolin scales. At the centre of this complicity is an inherently flawed regulatory system in which pharmaceutical companies can commercially produce and sell pangolin scale medicines.

The Chinese Government claims its wildlife product traceability scheme ensures pangolin scales used in approved medicines originate only from old verified stockpiles, but there is a mismatch between availability and demand. Lack of traceability and transparency, and an insufficient regulatory system, has opened avenues for laundering pangolin scales illegally sourced from throughout Asia and Africa.

The trafficking of pangolin scales into China is devastating wild pangolin populations. All eight pangolin species are classified as being at risk of extinction on the International Union for Conservation of Nature (IUCN) Red List. Patchy information exists on the actual numbers of pangolins remaining in the wild, but in areas of Asia they are known to have disappeared completely. Some pangolin populations are thought to have declined by as much as 80 per cent in the 21 years between 1998 and 2019.

In 2019, the worsening plight of pangolins was confirmed when three species – two African and one Asian – were re-classified into higher categories of extinction risk.

The IUCN cited the growing impacts of poaching, illegal trade and habitat loss in the escalating vulnerability of pangolins. Further reductions of between 30-80 per cent are possible during the coming decades if urgent action to curb demand for pangolin products and protect their habitat is not taken.

Pangolin scales: a long history of commercial trade

Pangolins have a long history of being used for multiple purposes around Asia, Africa and America and the use of their scales for medicinal purposes has been documented in many range states. In China, the first record of pangolin scales being used for medicine is from a sixth century Chinese herbal medicine book (‘Shen Nong’s Classic of Materia Medica’ - 本草綱目). Throughout the 20th century, large volumes of Asian pangolin scales were legally and illegally traded from across South-East Asia to China for use in TCM. Asian pangolin scales were also heavily traded to make leather products such as boots in the United States, Mexico and Japan. This overexploitation devastated populations of the Chinese (Manis pentadactyla) and Sunda (Manis javanica) pangolins across the region and in China pangolins declined by 94 per cent between the 1960s and 2000s.

In the early 1990s, the domestic supply of pangolins in China became so low that traders were increasingly sourcing large quantities from South-East Asian countries such as Laos, Vietnam and Myanmar. A ripple of major pangolin declines ensued and between 1996 and 2014 the conservation status of both the Chinese and Sunda pangolins had moved from being Near Threatened to Critically Endangered on the IUCN Red List. In 2019, the Philippine pangolin (Manis cuvieri) was listed as Critically Endangered and now the other five species are facing a similar fate.

In 2015, after decades of concern over the levels of illegal and legal international pangolin trade, at the 17th Conference of Parties (CoP17) of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) all eight pangolin species were up-listed to Appendix I of the convention. This entered into force in January 2017, making it illegal for pangolins and their parts and derivatives to be traded internationally for commercial purposes. A CITES Resolution adopted at CoP17 encouraged pangolin consumer states to implement measures to reduce demand for illegal pangolin specimens.

A crisis: high-volume transnational pangolin scale trafficking

Transnational pangolin trafficking is an exceptionally profitable criminal enterprise that involves sophisticated methods of operation and the territories of at least 32 countries. While Asia was the primary source of pangolin scales throughout the 20th century and the start of the 21st century, since 2008, as Asian pangolins have become increasingly impacted, criminal networks have shifted to heavily exploiting African pangolins.

The majority of pangolin scales are trafficked to China using maritime shipping services and the top smuggling routes involve Nigeria, Cameroon, the Democratic Republic of the Congo (DR Congo), Malaysia, Singapore, Vietnam, Hong Kong.

Between 2018-20, EIA has conducted undercover investigations into pangolin trafficking across the Africa-To-Asia supply chain. These have uncovered criminal networks involving nationals of China, Vietnam, Nigeria, Guinea, Cote d’Ivoire and DR Congo, which are actively sourcing and exporting vast quantities of pangolin scales. Between June 2019 and August 2020 alone, EIA separately engaged 23 traffickers who together claimed to be in possession of 136 tonnes of pangolin scales, an amount comparable to the total quantity publicly reported as seized in 2019.

EIA’s investigations have documented how pangolin scale buyers from China and Vietnam are connected to suppliers from African countries in networks heavily reliant on corruption. The involvement of corrupt customs officers, clearing agents, freight forwarders and transportation company staff enables pangolin scales to reach their intended destinations.

As corroborated by seizure data, EIA has found that a high proportion of pangolin sourcing activity is taking place in West and Central Africa. This involves an extensive sourcing footprint stretching across the region’s tropical forests and savannahs.

Pangolin scale shipments are either sent directly to the primary destination, China, usually with a transshipment location en route, or via a transit hub such as Vietnam or Hong Kong. Shipments through these transit hubs may also undergo transshipment en route from African countries. In Vietnam, shipments are broken down into smaller batches to be smuggled into China overland. EIA has documented pangolin scale traffickers who are also involved in the trafficking of other high-value illicit commodities such as elephant ivory, rhino horn, tiger parts and products as well as illegal donkey skins and timber.

Consumer markets for pangolin scales, especially in China, enable transnational organised crime groups to profit from the illegal high-volume exploitation of pangolins. It is a crime that drives biodiversity loss, fuels corruption, weakens criminal justice systems, depletes the resource base of rural communities and undermines security.
International prohibitions, national authorisations

CITES and the continued trafficking of pangolins into China

Pangolins have been subject to varying levels of international trade controls under CITES since its inception as a treaty in 1975. Meaning that the tragedy of the global pangolin trafficking crisis has unfurled for almost half a century in full view of CITES Parties.

Acknowledging the risks posed to pangolins by overexploitation, in 1975 all Asian species were included on Appendix II (at the time only three Asian species were recognised) and one African species, Temminck’s ground pangolin (Smutsia temminckii).34

In 1977, all eight pangolin species from Appendix II to I was rejected and instead ‘zero export quotas’ were established for the Asian species.34 This happened even though the RST process concluded that all Asian species met CITES criteria for listing under Appendix I. In response to proposals for the uplisting, the Chinese Government pushed back, stating it believed more information was required about Asian pangolins before any transfer to Appendix I was made.42

In 2020, at CITES CoP17, a proposal for the uplisting of all Asian pangolins from Appendix II to I was rejected and instead ‘zero export quotas’ were established for the Asian species.34 This happened even though the RST process concluded that all Asian species met CITES criteria for listing under Appendix I. In response to proposals for the uplisting, the Chinese Government pushed back, stating it believed more information was required about Asian pangolins before any transfer to Appendix I was made.42

In the following years, the global legal trade in Asian pangolins dropped off considerably.43 However, seizure data indicate that, despite the increasingly imperilled status of Asian pangolins, the zero-export quota was undermined by continued demand, primarily from China, where the domestic market not only persisted but was legally encouraged.44,45 This was while other major destination countries for legal imports pre-2000 such as the US, Mexico and Japan registered abrupt declines in legal imports and minimal seizures.44,45

In the decade following the introduction of zero export quotas for the Asian species, there was limited international attention on the pangolin trade and role of demand from consumers in China. Despite reports of the growing trafficking of pangolin meat and scales into China from South-East Asian countries such as Vietnam, Indonesia and Malaysia.46

In 2010, the CITES Secretariat issued an alert (CITES Alert No. 37) highlighting that illegal trade in pangolins was expanding. Then, in 2014, the Secretariat described the illegal trade in pangolins as “escalating at an alarming rate”.47 It listed several seizures of pangolin meat and scales and stated that China was reported as the final destination for the majority of these. Meanwhile, an emerging legal and illegal trade in pangolin scales from African countries to Asia was picking up pace. Needing recommendations from the First Pangolin Range States Meeting in 2015, all eight pangolin species were eventually uplisted to Appendix I at CoP17, making their international commercial trade illegal.48

Adopted at CoP17, Resolution Conf. 17.10 on the ‘Conservation of and trade in pangolins’ encourages consumer states to reduce demand for illegal pangolin products. As written, this fails to go far enough in calling for the closure of local domestic pangolin markets or for traditional medicine industries to eliminate the use of pangolin parts and derivatives. Something for which there is precedent in CITES Resolutions and Decisions for wildlife experiencing high levels of illegal trade including elephants, Asian big cats, rhinos and the Tibetan antelope.49

Laws in China permit commercial pangolin scale trade

Controls on the trade in pangolins in China date back to at least 1977 when their export was banned because it was thought a cancer cure could be derived from pangolin body parts.46 This was at a time when many thousands of pangolins were being exported from China to Hong Kong, possibly for the skin trade to the US.46

In 1987, acknowledging the worsening conservation status of pangolins in China, the Chinese pangolin (Manis pentadactyla) was listed as a “Level II protected wild medicinal material species” under the TCM wild materials management regulation.46 The listing meant that any harvesting or hunting of pangolins from the wild required a Government permit and export was limited. Under this regulation, Level II listed species were those with a reduced distribution and depleted population.

Pangolins first received formal protection in China in 1989 when the Chinese pangolin was listed as a species subject to second-class special state protection under the Wildlife Protection Law of 1988.47 This meant that pangolins could only be legally hunted or captured from the wild with a hunting licence.

In 2020, the Chinese pangolin as well as Sunda (Manis javanica) and Indian (Manis crassicaudata) pangolins were listed as species subject to first-class special state protection.47 This means that breaches of the Wildlife Protection Law relating to these three species will now incur more severe penalties. The trade of species under special state protection for consumption as food has been banned in China since 2014.48 However, a central tenet of the original Wildlife Protection Law, as well as later amended versions passed in 2004 and 2016, is that protected species can be subject to commercial trade and utilisation. So, even though the Chinese pangolin was listed as a protected species, and consumption as food prohibited, exemptions in the 1988 law allowed for the commercial sale, purchase and use of pangolins and their parts for other purposes.

Recent years have seen overwhelming evidence that pangolins are being farmed and sold as food, with an increase in trade and processing facilities and a rise in international sales of pangolin scales.49

Above: At CITES CoP17 in September 2016 in Johannesburg, South-Africa Parties agreed to uplist all eight pangolin species from Appendix II to I.
In the latest 2017 version of the law, commercial use of species subject to special state protection is outlined in Article 27. This exemption gives provincial forestry departments the authority to approve the sale, purchase and utilisation of species subject to special state protection for certain uses, including TCM. This has created a regulatory environment in which possession of a protected species is not illegal and the products of pangolins and other globally threatened wildlife such as leopards, Asiatic black bears, musk deer, Saiga antelope and hawksbill turtles can be legally traded in TCM.

Non-native pangolins are subject to domestic protections by virtue of their CITES listing. Article 35 of the Wildlife Protection Law stipulates that CITES-listed species can be managed as species under special state protection. Earlier notifications have also conferred domestic protections upon non-native CITES-listed species.

However, while commercial import and export of all pangolins is currently prohibited, application of the strictest domestic protections are not necessarily guaranteed. Article 35 of the Law also gives the National Forestry and Grassland Administration (NFGA, formerly the State Forestry Administration, or SFA) a mandate to ‘approve’, and thereby potentially alter, protections for non-native species.

In 2003, the SFA and the State Administration for Industry and Commerce (SAIC, now subsumed as part of the State Administration for Market Regulation) launched a pilot system to regulate the commercial trade and use of wildlife under special state protection and their products through a centralised body called the China Wildlife Mark Centre (CWMC). The CWMC is responsible for the research, development and coordination of the commercial utilisation of wildlife in China. It set out a certification system that formalised the use and consumption of nationally protected and utilised wildlife by commercial manufacturers, such as pharmaceutical companies, through a registration and labelling scheme called the China National Wildlife Mark (CNWM) – often referred to as a ‘special marking’.

In 2007, SFA notice 2007 No. 242 announced that pangolins (known as “Squama Manitis” in TCM terminology) were to be regulated under the CNWM Scheme. This joint notice was issued by the SFA, the Ministry of Health, the SAIC, the State Food and Drug Administration (SFDA, later renamed the National Medical Products Administration, or NMPA) and the State Administration of Traditional Medicine (SATM, later renamed the National Administration of Traditional Chinese Medicine, or NATCM).

Notice 2007 No. 242, which also covered saiga antelope horns and ‘rare’ snakes, stated that appointed hospitals and licensed pharmaceutical companies could legally acquire raw pangolin scales from an inventoried national stockpile as outlined in annual national and provincial quotas. The 2007 notice allows for appointed hospitals to use and prescribe raw pangolin scales, while licensed pharmaceutical companies can sell and manufacture processed ‘patent’ pangolin scale medicines that are registered and packaged according to the CNWM guidelines.

Subsequent notices by the SFA, NMPA and NATCM in 2008 and NFGA pangolin scale quota announcements further outlined how licensed pharmaceutical companies can manufacture over-the-counter patent medicines based on Government-approved formulas, as well as yinpian (Figure 1).

In 2020, the NFGA published a new notice on pangolins outlining how it plans to strengthen the protection and management of pangolins. This notice recognises that pangolin populations are deteriorating, ends licenced pangolin hunting and makes some strong statements on their protection. These include measures to strengthen the protection of wild populations, crack down on pangolin trafficking and illegal sale and raise public awareness of pangolin conservation issues. However, it completely fails to address the existence of the legal market for pangolin scale medicine.

In June 2020, The Health Times of the People’s Daily, a China Communist Party-owned newspaper, published a news story announcing that pangolins had been removed from the Chinese Governments’ official TCM pharmacopoeia and would not appear in the 2020 edition of the book. It reported the reason for this as the “exhaustion” of wild pangolin populations. Even though there was no official Government notice, this news was widely reported in the international media, with some interpreting it as a ban on the use of pangolin scales in TCM.

Soon after the news was reported, EIA obtained a copy of the 2020 TCM pharmacopoeia and established that “pangolin” – described as the Chinese pangolin in the 2015 edition – had been removed from a section listing ‘key TCM ingredients’. However, pangolin scales were still included as an ingredient in patent medicines. Patent medicines are those which have been formally approved for commercial production by the Chinese Government.
Eight patent medicine formulae listing pangolin scales as an ingredient remain in the 2020 TCM pharmacopoeia. These include ‘Zaizao Wan’, which comes in pill form and is used to help blood circulation (Figure 2), and ‘Awei Huapi Gao’, a treatment used to relieve, among other things, abdominal pain (see Appendix A for full list).

In China, legal trade in medicinal products is not always restricted to ingredients and patent medicines listed in the pharmacopoeia. EIA has identified 72 additional patent medicines containing pangolin scales on four official Government medicine lists from the Ministry of Health and NMPA (Figure 3).

Since patent medicines containing pangolin scales remain in official Government lists and there have been no new Government notices banning the use of ‘registered’ pangolin scale stockpiles by licenced pharmaceutical companies and hospitals, Notice 2007 No. 242 still stands (Figure 4). This means that a minimum of 221 pharmaceutical companies (identified through the open-source research presented on page 22) and 713 hospitals can still produce and sell patent medicines containing pangolin scales.

The implication of the removal of the Chinese pangolin from the raw ingredients section of the pharmacopoeia is not immediately clear. Although unconfirmed, it is very likely that pangolin scale yinpian can still be used and prescribed by licenced hospitals. A similar situation currently exists with farmed bear bile, which is excluded from the raw ingredients section but is still used in official patent medicines and even funded and promoted by the Chinese Government’s national medical insurance scheme.

Below: Examples of medicinal conditions purportedly treated by pangolin scale TCM products, as per pharmacopoeia.

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of Formulized containing Pangolin Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Standard for Chinese Patent Drugs by the Ministry of Health</td>
<td>54</td>
</tr>
<tr>
<td>List of new medicines approved by the National Drug Administration (see Appendix B)</td>
<td>8</td>
</tr>
<tr>
<td>List of processed Chinese medicines approved by the National Medical Products Administration</td>
<td>6</td>
</tr>
<tr>
<td>Registered standards (see Appendix A)</td>
<td>4</td>
</tr>
<tr>
<td>The Pharmacopoeia</td>
<td>8</td>
</tr>
</tbody>
</table>

**NEW**

Legal? Covered by National Insurance

<table>
<thead>
<tr>
<th>Coverd by National Insurance</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preprocess products (patented formula)</td>
<td>YES</td>
<td>OUT of the 82 patented TCM formulas registered: +8 are from the Pharmacopoeia (see Appendix C); +75 are from other official sources</td>
</tr>
<tr>
<td>Raw pangolins</td>
<td>YES</td>
<td>The government has removed pangolins in its insurance form, i.e. yinpian, from being covered by national insurance.</td>
</tr>
</tbody>
</table>

*Pangolin* (in red circle above) are stated to be removed on page IX of the 2020 Pharmacopoeia.

Pangolin scales (in red circle below) continue to be embedded in the ingredients required to produce the patent medicine Zaizao Wan (in blue circle) on Page 870 of the 2020 Pharmacopoeia.

*Pangolins* (in red circle above) are stated to be removed on Page 870 of the 2020 Pharmacopoeia.

The implication of the removal of the Chinese pangolin from the raw ingredients section of the pharmacopoeia is not immediately clear. Although unconfirmed, it is very likely that pangolin scale yinpian can still be used and prescribed by licenced hospitals. A similar situation currently exists with farmed bear bile, which is excluded from the raw ingredients section but is still used in official patent medicines and even funded and promoted by the Chinese Government’s national medical insurance scheme.

EIA has established that in 2019, while pangolin scale yinpian was removed from the list, the insurance scheme actually added a patent pangolin scale medicine to its coverage list (Weiling Guci Gao, which also uses donkey-hide gelatin) and continues to cover four patent medicines containing pangolin scales that were on the 2017 list (Figure 5). These include Zaizao Wan, Ba Du Gao, Huixiang Juhe Wan and Zhi Xue Wan (Appendix B). Although it is not clear why pangolin scale yinpian was removed from the insurance list and not the patent medicines, this demonstrates that the Chinese Government, by directly funding the consumption of pangolin scale medicines, is actively incentivising their use by TCM consumers and stimulating demand.

Top: Pangolin scales are included in five separate Chinese Government patent medicine lists. The 2020 edition of the TCM pharmacopoeia contains eight different patent pangolin scale medicines.

Bottom: Pangolin yinpian (in red circle) is stated as removed from the national insurance scheme in the government’s August 2019 announcement. Other animal products removed include donkey-hide gelatin (ejiao), saiga antelope antler powder and hawksbill turtle, among others.

In August 2019, China’s National Healthcare Security Administration and Ministry of Human Resources and Social Security released a joint notice updating an existing 2017 list of medicines covered under its national medical insurance scheme. Initial reports stated that medicines containing pangolin scales broadly were no longer covered by national medical insurance.

EIA has established that in 2019, while pangolin scale yinpian was removed from the list, the insurance
A bottomless pit: China’s dubious pangolin scale stockpile management system

Over the years, EIA has documented how China’s systems for regulating legal domestic trade in the parts and products of protected species are fundamentally flawed or are open to abuse, facilitating illegal trade.

This has included exposes of how the SF A/NFGA’s CNWM scheme has been abused by China’s wildlife trade industry to sell illegally sourced tiger products and elephant ivory.98,99,100,101 As tonnes of trafficked pangolin scales flow from source countries across Africa and Asia into China, the same flawed systems for regulating commercial wildlife use are being used by pharmaceutical companies to produce pangolin scale medicines (Figure 6).

The 2006 stockpile inventory

The Chinese Government has never publicly disclosed the origins or size of its “national” pangolin scale stockpile yet at CITES CoP18, in August 2019 it claimed that it strictly regulates the use of inventoried pangolin scale stockpiles.102,103 The basis of this regulation is the CNWM scheme (page 10) which is purportedly intended to ensure traceability around the use of Government-verified stockpiles.

In 2006, the SF A issued Notice No. 3 requiring all individuals and private companies with pangolin scale stockpiles to declare the quantity and time of acquisition of their stock to the relevant provincial forestry department.104 Provincial forestry departments were then required to inspect and verify the privately held stockpiles and report these to the SF A. This was under a national audit of selected wildlife product stockpiles, which also included leopard bone and bear bile, as part of the CNWM scheme. Following this initial inventory, any private traders with unregistered new stocks of pangolin scales were required to submit documents as evidence of legal origin before they could “sell, process, utilise or export” them.

With pangolins thought to be commercially extinct in China from the mid-1990s,105 the potential origins of the stockpiles declared during the 2006 inventory are dubious and legally questionable, especially given the lack of transparency around the stockpile management system. At the time, sources could have included legal imports under CITES, Government seizures and illicit international supply chains. CITES trade records for the period up to the national stockpile inventory in 2006 show that only a limited quantity, 7.6 tonnes of pangolin scales, were legally imported into China and these were in 1994 and 1996.106

The sheer volume of documented pangolin scale trafficking into China from across South-East Asia between 2000-07107 make it likely that the stockpiles registered in 2006 consisted of Asian pangolin scales sourced illicitly. If this included stocks seized by the Chinese Government, this would have been contrary to the recommendations of CITES Resolution Conf 9.10, which outlined that confiscated parts and derivatives of Appendix II species be disposed of to benefit “enforcement and administration” of the Convention.108

Annual quotas

Between 2008-14, seven national-level annual pangolin scale usage quotas were issued by the SFA, totalling 186 tonnes and averaging 26.6 tonnes a year (Appendix C).109 These quotas provided a limit on the amount of registered privately held pangolin scale stocks that could be approved by provincial forestry departments for transfer between private entities (such as wildlife trading and pharmaceutical companies) and to hospitals in each province.

Since 2015, no records of national pangolin scale quotas are available from any official Chinese Government online archive. Despite this, provincial forestry department documents and the ongoing sale of TCM medicines labelled as containing pangolin scales clearly show that the CNWM Scheme has continued to run.

For right, top: With the majority of pangolin scales seized from illegal trade destined for China, it is likely that illicit pangolin scales are being laundered into the legal supply chain.
Mismatch between quotas and demand

The annual quotas allotted by the SFA represent only a fraction of the quantities requested by pharmaceutical companies. For example, the Ningbo city forestry department’s 2009 annual quota announcement for individual companies stated that Zhejiang province approved the use of 364.4kg of registered pangolin scales by private entities. This was stated to represent only four per cent of the total quantity requested by companies. This would put the total quantity of pangolin scales requested at over 8.6 tonnes, which was 230 per cent greater than the allotted quota. This points to a significant mismatch between the quantities of pangolin scales required to meet production demands of pharmaceutical companies and availability through the national quota system.

Problematic provenance traceability

EIA has found images of 23 CNWM special marking labels issued between 2009-13 visible on the packaging of TCM medicines advertised online (Figure 7). As per SFA guidelines, the origin on these labels can be listed as either ‘Wild’, ‘Farmed’ or ‘Unknown’. Of 12 labels that are legible, five stated the pangolin scales contained in the medicines were from a ‘Wild’ source and the remaining seven from an ‘Unknown’ source. This implies that the SFA has approved the commercial use of pangolin scale stockpiles for which it is unable to verify the provenance, a requirement clearly stated in the 2007 stockpile management guidelines. This is a clear example of the CNWM special marking scheme failing to perform its purported function in ensuring traceability and legality of pangolin scales used by pharmaceutical companies.

Limited legal supplies to meet demand

There is no up-to-date information on the level of demand for pangolin scales in China but between 1990-93, one pharmaceutical company was reported to have acquired 70 tonnes of pangolin scales and, in 1991, imports of 63 tonnes of pangolin scales into China were recorded. In 2002, it was thought that about 80-100 tonnes of pangolin scales were consumed for medicine in the country every year.78,79 Pangolin scale quota allocations between 2008-14 do not even come close to meeting these dated estimates of supply and demand.

Following the 2006 national inventory and guidelines set out by the SFA in the 2006 (No. 3) and 2007 (No. 242) notices, no further pangolin scale stockpile registration or usage guidelines have been published. This means it is possible that newly acquired stockpiles have been registered to comply with provincial forestry departments. Plausible sources of new pangolin scale stockpiles would include imports permitted through CITES, seized stock sold or auctioned by the Government to companies and hospitals and stock sourced through illicit international supply chains.

Even though the NFIA, China TCM Association and the TCM industry have proactively promoted the captive-breeding of pangolins as an option to generate commercial supplies of pangolin scales, a scientific evaluation of its commercial viability clearly shows that it is not feasible.80 It is not possible that stockpiles have been harvested from pangolins bred in captivity.

In 2016, the SFA issued a draft regulation on the disposal of seized wildlife products.81 While it is not known whether this was ever officially issued, the regulation states that if certain conditions are met, seized wildlife products can be auctioned by the Government and the proceeds turned over to the State treasury.

EIA is aware of one example of pangolin scales being auctioned by the Chinese Government. In 2013, Anhui provincial forestry department commissioned a company based in Anhui province to auction a stock of pangolin scales. Given the sale price of RMB 1.47 million ($200,000), the auction likely involved a significant quantity of pangolin scales. More recent examples from Anhui provincial forestry department documents show that two pharmaceutical companies were given approvals in 2018 and 2019 to trade in “seized” and “auctioned” stock.

While Government officials have publicly stated that seized pangolin scales are on occasion destroyed, these examples demonstrate that they have also entered commercial supply chains and plausibly continue to do so. The Chinese Government seized a minimum of 67.5 tonnes of pangolin scales between 2010-19 and there is a lack of public information as to how these have been stored or disposed of.

Any continued sale or auctioning of seized pangolin stocks by the Chinese Government would be contrary to CITES’s latest recommendations on the disposal of confiscated Appendix 1 specimens outlined in Resolution Conf. 17.8.

The lack of transparency around the Government’s pangolin scale stockpile management system means that a thorough audit over the origins of new stocks is near impossible. With limited legitimate sourcing channels, serious questions arise as to how pharmaceutical companies and hospitals can generate the gigantic quantities of unprocessed pangolin scales required to satisfy demand.

Above: A TCM outlet in Guangzhou, China. Under the national pangolin scale guidelines, stores such as this cannot sell raw or semi-processed (yinpian) pangolin scales but many do so.
Companies sourcing scales from Africa

EIA’s open-source investigations have identified examples from two Chinese provinces — Anhui and Guangdong — showing that wildlife trading companies have sourced pangolin scales through international supply chains and sold these on to pharmaceutical companies.

A CITES export permit and Air Waybill obtained through an EIA undercover investigation show that a company involved in the 2018 sale of two tonnes of pangolin scales, as detailed in an Anhui provincial forestry department document, imported multiple tonnes of pangolin scales from an African country to China two years earlier in 2016. At least two of these approvals were granted soon after the CITES Appendix I uplisting was adopted in September 2016, flouting the will of the parties (Figure 8). A further two were issued after the uplisting entered force in January 2017, therefore allowing the company to import scales in violation of CITES. The documents also show that one of the wildlife trading companies sold a large quantity of pangolin scales to a pharmaceutical company based in Guangdong province, which in turn supplied the stock to a large State-owned pharmaceutical company based in Hebei province.

Guangdong provincial forestry department awarded seven separate approvals to a wildlife trading company and one of its subsidiaries for the import of pangolin scales from African countries between 2015-17. At least two of these approvals were granted soon after the CITES Appendix I uplisting was adopted in September 2016, flouting the will of the parties (Figure 8). A further two were issued after the uplisting entered force in January 2017, therefore allowing the company to import scales in violation of CITES. The documents also show that one of the wildlife trading companies sold a large quantity of pangolin scales to a pharmaceutical company based in Guangdong province, which in turn supplied the stock to a large State-owned pharmaceutical company based in Hebei province.

Convoluted stockpile trade and laundering risks

EIA has identified 24 Anhui provincial forestry department documents shedding further light on this provincial level trade in which 12 Anhui-based companies were authorised to sell or purchase pangolin scale stocks between 2014-19. NFGA national quota documents show that Anhui province was assigned only 360kg of pangolin scales, all in the year 2011 (Appendix C). This implies the province might not play a significant role in the pangolin trade. However, the Anhui provincial forestry department documents show pharmaceutical companies in the province have purchased 13.9 tonnes of pangolin scales between 2014-19 — 39 times the province’s allotted 2008-14 quota. Such transfers demonstrate major inconsistencies between the approved quantities of pangolin scales available to pharmaceutical companies and the actual quantity involved in active trade at the provincial level.
The Anhui documents show there has been a minimum of 24 approved transactions involving the sale or purchase of inventoried quota stockpiles between companies in the province. These have involved 17 approvals for the purchase of stockpiles from other companies, all but one of which were based outside of Anhui province, and seven approvals for the sale of stockpiles to companies in other provinces. The documents specifically mention that the approvals were issued as permitted by Article 27 of the Wildlife Protection Law (Figure 9).

Further examination of the quantities traded under each provincial forestry department approval reveals an average pangolin scale quantity of 841.6kg per transaction. This quantity exceeds what most provinces are allotted per year. This brings into question how each pharmaceutical company can obtain such a large quantity of inventoried pangolin scales from the national stockpile, and whether such transfers between pharmaceutical companies contradict the annual quota guidelines. These clearly state that no additional quota can be granted by provincial forestry departments, and the use of allotted pangolin scales cannot be extended into subsequent years.

Under the 2006 (No. 3) and 2007 (No. 242) notices, provincial forestry departments must verify, register and inventory stockpiles held by each pangolin scale stock owner. However, once verified, legal origin does not need to be demonstrated at any stage of trading, processing, and exporting. Given the difficulties in tracing the origins of pangolin scale stockpiles, this convoluted trade in quota stocks between private entities could very easily be exploited to launder illicitly sourced pangolin scales into the legal supply chain.

Figure 9: Anhui provincial forestry department 2018 approval for pangolin scale transfer referencing Article 27 of the Wildlife Protection Law

Below: In 2017, The Beijing News reported a story about the purchase of 1.5 tonnes of inventoried pangolin scales by Beijing Tong Ren Tang (Bozhou) Yinpian Co. Ltd from Sichuan Huatang Pharmaceutical Co. Ltd.

In 2017, The Beijing News reported a story about the purchase of 1.5 tonnes of inventoried pangolin scales by Beijing Tong Ren Tang (Bozhou) Yinpian Co. Ltd from Sichuan Huatang Pharmaceutical Co. Ltd.

The regulatory system run by the Chinese Government that permits pharmaceutical companies to produce and sell pangolin scale medicines.
Pangolin business: the medicines advertised online

To document the availability of legal pangolin scale medicines in China and the role of TCM pharmaceutical companies in the pangolin trade, EIA's open-source investigation focused on the products advertised by manufacturers online.

A staggering 56 pharmaceutical companies were identified to be advertising a total of 64 pangolin scale medicines. The medicines were also found to include the products of other globally threatened and Appendix I listed species including leopard bone, natural musk from musk deer and bear bile. The companies identified included China’s largest TCM pharmaceutical company, Beijing Tong Ren Tang Co Ltd, which has subsidiaries across the world and whose investors include major European and US investment funds.

All companies found to be selling pangolin scale medicines were given a right to reply by EIA before publication of this report, we received no responses.

Methodology

By searching the term ‘pangolin’ in Chinese (穿山甲, Chuan Shan Jia) – on TCM reference websites, EIA identified 80 known patent TCM formulations in official Government medical standards which contain pangolin scales as an ingredient. By searching each formulation on the National Medical Products Administration (NMPA) website (nmpa.gov.cn) we built a list of 221 pharmaceutical companies issued with approvals to produce 318 medicine products.

Each NMPA approval contains a unique identification code comprising a letter and eight numbers, which is printed on the product packaging (Figure 10). While this code demonstrates that a company has approval by the NMPA to produce and sell the medicine, it does not verify the final products produced contain legally sourced wildlife ingredients. The Government verification of the legality of the pangolin scales contained within the product is provided by the CNWM special marking label, which has a different code. Through our research, we identified 23 distinct CNWM labels (page 16).

To confirm the medicines were under production and being advertised for sale, we used web search engines to identify the websites of pharmaceutical companies with approvals to sell medicines which may, according to official standards, contain pangolin scales. Of 221 companies identified, we located 56 that were actively advertising patent pangolin scale medicines online. A total of 64 products were found on manufacturer websites and 101 products on third party sites (including hwzyjt.com, hayao.com, ypk.39.net and yao.xywy.com). The following pages list the products available from each practitioner’s website.

Given the likelihood that additional pharmaceutical companies may well be producing and selling TCM products containing pangolin without publishing details on an easily identifiable website, the 165 products identified represent the absolute minimum number of pangolin scale TCM products available for sale in China.

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Given the likelihood that additional pharmaceutical companies may well be producing and selling TCM products containing pangolin without publishing details on an easily identifiable website, the 165 products identified represent the absolute minimum number of pangolin scale TCM products available for sale in China.
Product 3
Zaizao Wan [Rejuvenation pill]
Beijing Tong Ren Tang Company Limited – Pharma
北京同仁堂股份有限公司同仁堂制药厂
Product page: Product image:
https://gf.tongrentang.com/menu518/gfDetail/848.html

Ingredient list [Pangolin circled in red]:

Source
CNWM permission: N/A
NMPA permission: Z11020189
Permits ref: N/A

Company 2
Company name
Tianjin Zhongxin Pharmaceuticals Group Co. Ltd (Darentang Pharmaceuticals Factory)
天津中新药业集团股份有限公司
Based in: Tianjin
Subsidiaries or affiliates in: N/A

Product 1
Fengshi Guanjieyan Wan [Rheumatoid arthritis tablet]
Product page: Product image:

【成份】马钱子(调制粉)、麻黄、当归、苍术、续断、桃仁、红花、乳香(制)、没药(制)、千年健、地枫皮、羌活、地龙、桂枝、穿山甲(制)、木瓜、牛膝。

【功能主治】祛风燥湿,活血止痛。用于风湿痹痛,腰腿疼痛,风湿关节炎等症。

【规格】每丸重3g

【用法用量】口服。一次1丸,一日1次。

【特别提示】产品包装不定期更替,请以收到实物为准。

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津ICP备14001237号

Ingredient list [Pangolin circled in red]:

CNWM permission: Tj10/12/xk4kqkkq9j
NMPA permission: Z11020295
Source
The source of the pangolin scales used in this product is labelled as "unknown"
Permits ref: Permits issued by the State Forestry Administration to in 2012 (permit number 林护动植便字 [2012]51号)

Product 2
Wu Xiang Shang Gao [Anti-inflammation cream]
Product page: Product image:

Ingredient list [Pangolin circled in red]:

CNWM permission: N/A
NMPA permission: Z33020236
Source
N/A
Permits ref: N/A

Company 3
Company name
Hangzhou Zhuyangxin Pharmaceutical Co. Ltd
杭州朱养心药业有限公司
Based in: Hangzhou
Subsidiaries or affiliates in: N/A

Product 1
Wan Ling Wu Xiang Gao [Rheumatism relieving cream]
Product page: Product image:

Ingredient list [Pangolin circled in red]:

CNWM permission: [Unclear]
NMPA permission: Z33020534
Source
The source of the pangolin scales used in this product is labelled as "wild"
Permits ref: N/A

Product 2
Wu Xiang Shang Gao [Anti-inflammation cream]
Product page: Product image:

Ingredient list [Pangolin circled in red]:

CNWM permission: N/A
NMPA permission: Z33020236
Source
N/A
Permits ref: N/A
In the mail: the pangolin products with international shipping

EIA has found six pangolin scale medicine products manufactured in China available for purchase with international shipping on e-commerce platforms. Some of the e-commerce platforms used are the world’s largest, such as eBay and Taobao (owned by Alibaba) (Figure 12).

Under CITES, the international trade in these pangolin medicine products would be illegal since they would be defined as containing "any readily recognisable part or derivative thereof" as outlined in CITES Resolution Conf. 9.6 (Rev. CoP16). This demonstrates the significant potential for China’s legal pangolin scale medicine market to generate products that are exported and therefore enter illegal international trade.

Figure 12: Examples of e-commerce platforms with pangolin scale medicines available for sale with international shipping
Time for action: Chinese Government must close its legal pangolin scale market

In 2016, following years of pressure from the international community and wildlife campaigners, the Chinese State Council issued an order banning the processing and sale of elephant ivory. This recognised that closing the legal domestic ivory market would help combat the global trafficking of ivory.128 Now is the time for similar leadership from the Chinese Government to eliminate consumer demand for traditional Chinese medicines containing the products of globally threatened species.

The findings presented in this report show that China’s legal trade in pangolin scale medicine has a high potential to be driving the global pangolin trafficking crisis. On the horizon, the growing global expansion of TCM through China’s Belt and Road Initiative will potentially exacerbate the threat trafficking poses to wildlife, including pangolins. Meaningful action from the Chinese Government to close its domestic market for pangolin scale medicines is urgently required.

China’s Wildlife Protection Law, particularly Article 27, plays a pivotal role in ensuring a flawed system for regulating the commercial trade in pangolin scales persists. This legal context legitimises the consumption of pangolin scales in medicine and stimulates consumer demand for an illicit product that is sustaining transnational organised crime and pushing pangolins towards extinction.

Most TCM medications do not use the body parts of globally threatened wildlife and the replacement of pangolin scales in TCM is feasible. Recently, academics have pointed out that herbal substitutes with similar purported functions do exist.130 Pangolins carry coronaviruses and may have played an intermediary role in the 2019 spillover of coronavirus (SARS-CoV-2) from bats to humans in China.131,132,133,134 While the science on this link is not conclusive, it does demonstrate that the trade in pangolins poses a global human health risk. The pangolin scale medicine supply chain involves many stages in which humans can be exposed to the viruses they carry.135

In February 2020, China announced regulations prohibiting the consumption of terrestrial wild animals as food, a measure intended to safeguard human health.136 This failed to also prohibit the trade in wild animals for other purposes such as traditional medicine.137 The use of wildlife parts in medicine is also a risk factor in disease spillover since it requires the capture, transport and processing of animals.

Stakeholders in China are already calling for the wildlife consumption ban to extend beyond food and include the medicinal use of wildlife.138 Action from the Chinese Government to end the use of wild animals, such as pangolins, in medicine is a critical measure needed to prevent future pandemics and protect the world’s rapidly declining biodiversity.

Above: Temminck’s pangolins (Smutsia temminckii) rescued from the illegal wildlife trade in Zimbabwe by Tikki Hywood Foundation

Environmental Investigation Agency

SMOKE AND MIRRORS
Recommendations

The Chinese Government should:

• Prohibit the acquisition, sale or possession, including for medicinal purposes, of all parts and products of pangolins and other globally threatened species, including those from captive-bred sources. This can be achieved by amending the Wildlife Protection Law, including key Articles such as 25, 27 and 28 to unambiguously prohibit commercial use of wildlife under special State protection or CITES Appendix I listed species.

• Remove pangolins and other globally threatened species entirely from the TCM pharmacopoeia and other nationally approved medicine lists to end the production of patent medicine containing these species as an ingredient.

• Destroy Government and privately held stockpiles of pangolin scales where they are no longer needed for criminal justice, scientific or training purposes.

• Clarify the penalties for pharmaceutical companies and hospitals which illegally source, manufacture or sell pangolin scales.

• Implement an extensive demand-elimination and consumer behaviour change campaign to end the use of pangolins and other globally threatened species in TCM.

• Continue successful efforts to investigate and prosecute transnational criminal networks involved in pangolin trafficking, in cooperation with source and transit countries.

The companies named in this report should:

• Immediately cease production and sale of products containing pangolin scales.

• Revise formulations of these products and replace pangolin scales with herbal alternatives from sustainable sources.

• Make a public statement that they will no longer use the products of wildlife threatened by trade.

Investors of these companies should:

• Withdraw investments in the companies detailed in this report pending assurances that the company will cease the use and sale of pangolins and other wildlife threatened by trade.

• Review investment portfolios and publicly announce divestment in companies using wildlife threatened by trade.

CITES Parties should:

• Call for urgent action by China to eliminate consumer demand for pangolin scale products, including the closure of its domestic legal market for TCM containing pangolin scales.

• Call for the adoption of an amendment to Resolution Conf. 17.10 on the conservation of and trade in pangolins so that it strongly encourages Parties with high levels of consumer demand for pangolin specimens to eliminate demand for these, including closing legal domestic markets.

• Call for the adoption of an amendment to Resolution Conf. 17.10 so that the Secretariat is instructed to report to the Standing Committee and the Conference of the Parties on the status of pangolins in the wild, their conservation and trade controls in place.

• Call for urgent action by pangolin range, transit and consumer states to address pangolin trafficking, using intelligence-led investigations and implementation of legislation aimed at disrupting transnational organised crime, including money laundering laws.

Source and transit countries, especially Nigeria, Cameroon, the Democratic Republic of the Congo, Malaysia, Singapore, Vietnam and Hong Kong should:

• Where necessary, strengthen legal frameworks for the protection of pangolins and other globally threatened wildlife, and those related to combating transnational organised crime.

• Resource and undertake multi-agency intelligence-led investigations into the criminal networks involved in pangolin scale trafficking, including the corrupt facilitators and enablers implicated, and deliver successful prosecutions with proportionate penalties.
### Appendix I: full list of pangolin products still in pharmacopoeia 2020

<table>
<thead>
<tr>
<th>Name of formula</th>
<th>English translation</th>
<th>Purposes</th>
</tr>
</thead>
<tbody>
<tr>
<td>再造丸</td>
<td>Zaizao Wan</td>
<td>Improve blood circulation</td>
</tr>
<tr>
<td>拔毒膏</td>
<td>Ba Du Gao</td>
<td>Expel pus and other toxics, anti-inflammatory</td>
</tr>
<tr>
<td>金蒲胶囊</td>
<td>Jin Pu Jiaonang</td>
<td>Treat gastric cancer and esophageal cancer; clear phlegm and other toxics</td>
</tr>
<tr>
<td>阿魏化痞膏</td>
<td>Awei Huapi Gao</td>
<td>Relieve abdominal pain and tight chest</td>
</tr>
<tr>
<td>茴香橘核丸</td>
<td>Huixiang Juhe Wan</td>
<td>Relieve pain and testicular swelling</td>
</tr>
</tbody>
</table>

### Appendix II: full list of pangolin products still covered by national insurance

<table>
<thead>
<tr>
<th>Name of formula</th>
<th>English translation</th>
<th>Source of patented ingredient list that contains pangolin</th>
</tr>
</thead>
<tbody>
<tr>
<td>再造丸</td>
<td>Zaizao Wan</td>
<td>Pharmacopoeia 2020 (中国药典)</td>
</tr>
<tr>
<td>拔毒膏</td>
<td>Ba Du Gao</td>
<td>Pharmacopoeia 2020 (中国药典)</td>
</tr>
<tr>
<td>金蒲胶囊</td>
<td>Jin Pu Jiaonang</td>
<td>Pharmacopoeia 2020 (中国药典)</td>
</tr>
<tr>
<td>阿魏化痞膏</td>
<td>Awei Huapi Gao</td>
<td>List of new medicines approved by the National Medical Products Administration (国家药品监督管理局)</td>
</tr>
<tr>
<td>茴香橘核丸</td>
<td>Huixiang Juhe Wan</td>
<td>National Standard for Chinese Patent Drugs by the Ministry of Health (国家卫生健康委员会)</td>
</tr>
</tbody>
</table>

### Appendix III: Annual consumption of pangolin scales stockpile, announced by NFGA

<table>
<thead>
<tr>
<th>Annual consumption of pangolin scales stockpile (in kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>181,867</td>
</tr>
</tbody>
</table>

| **Beijing**                                          |
| 20,946     | 3,591      | 4,370      | 6,272      | 5,975      | 5,000      | 5,000      |

| **Shanghai**                                         |
| 24,758     | 3,960      | 3,721      | 3,558      | 3,927      | 4,330      | 4,330      |

<p>| <strong>Guangdong</strong>                                        |
| 13,749     | 1,410      | 1,410      | 2,418      | 2,606      | 2,247      | 2,230      |</p>
<table>
<thead>
<tr>
<th>Company name (Chinese as original)</th>
<th>Based in</th>
<th>Product name</th>
<th>Image of the product &amp; ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMP A: Z12020414</td>
<td>Jilin Shuangxing Pharmaceutical Co., Ltd</td>
<td>Shandong Shandong Huaxing Pharmaceutical Co., Ltd</td>
<td><img src="http://www.35.net/index.php?m=content&amp;c=index&amp;a=show&amp;catid=13&amp;id=145" alt="Image" /></td>
</tr>
<tr>
<td>Company name (Chinese or origin)</td>
<td>Based in</td>
<td>Product name</td>
<td>Image of the product &amp; ingredients</td>
</tr>
<tr>
<td>----------------------------------</td>
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<td>--------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
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<td>Hubei</td>
<td>Ba Du Gao</td>
<td><img src="http://www.hbwssw.com/index_a_show_c_index_catid_20_id_22_m_.png" alt="Image" /></td>
</tr>
<tr>
<td>Henan Confidence Pharmaceutical Co., Ltd.</td>
<td>Henan</td>
<td>Zhenggu Gao</td>
<td><img src="http://www.handuyaoye.com/contents/11/211.html" alt="Image" /></td>
</tr>
<tr>
<td>Henan Jinzhong Pharmacy Co., Ltd.</td>
<td>Henan</td>
<td>Kang Shuan Jiao Nang</td>
<td><img src="http://www.hb.ne/33/20053293.html" alt="Image" /></td>
</tr>
<tr>
<td>Henan Confidence Pharmaceutical Co., Ltd.</td>
<td>Henan</td>
<td>Shengruzhi</td>
<td><img src="http://www.handuyaoye.com/contents/11/211.html" alt="Image" /></td>
</tr>
<tr>
<td>Shandong Ruihao Pharmaceutical Co., Ltd.</td>
<td>Shandong</td>
<td>Shengruzhi Lactation Drink</td>
<td><img src="http://www.handuyaoye.com/contents/11/211.html" alt="Image" /></td>
</tr>
<tr>
<td>Shandong Ruihao Pharmaceutical Co., Ltd.</td>
<td>Shandong</td>
<td>Shengruzhi Lactation Drink</td>
<td><img src="http://www.handuyaoye.com/contents/11/211.html" alt="Image" /></td>
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<td>Shandong</td>
<td>Shengruzhi Lactation Drink</td>
<td><img src="http://www.handuyaoye.com/contents/11/211.html" alt="Image" /></td>
</tr>
</tbody>
</table>
1. Species in which the destination was known.
2. Note: some data were used in this paper.
3. The IUCN Red List of Threatened Species is a list of threatened species ready-to-use form such as tablets, oral solutions or dry suspensions.
4. This information was not collected.
5. All references are available online.
6. References from the IUCN Red List of Threatened Species are available online.
7. The CITES Secretariat has compiled data from various sources and made them available online.
8. This information was not collected.
9. The IUCN Red List of Threatened Species is a list of threatened species ready-to-use form such as tablets, oral solutions or dry suspensions.
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11. References from the IUCN Red List of Threatened Species are available online.
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13. This information was not collected.
14. All references are available online.
15. References from the IUCN Red List of Threatened Species are available online.
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21. This information was not collected.
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23. References from the IUCN Red List of Threatened Species are available online.
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50. All references are available online.
51. References from the IUCN Red List of Threatened Species are available online.
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54. All references are available online.
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56. The CITES Secretariat has compiled data from various sources and made them available online.
57. This information was not collected.
58. All references are available online.
59. References from the IUCN Red List of Threatened Species are available online.
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61. This information was not collected.
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63. References from the IUCN Red List of Threatened Species are available online.
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85. This information was not collected.
86. All references are available online.
87. References from the IUCN Red List of Threatened Species are available online.
88. The CITES Secretariat has compiled data from various sources and made them available online.
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114. All references are available online.
Sunda pangolins (Manis javanica) rescued from poachers in Vietnam and undergoing rehabilitation in Cuc Phuong National Park, Vietnam.