



BIG CATS

With the exception of the African lion, all big cat species are listed in CITES Appendix I, meaning international commercial trade in these species is illegal except under a few narrow conditions.¹ This chapter focuses on the illegal market for tiger products, specifically bone products, but also touches on the markets for products from other species of big cats, like lion and jaguar, some of which are used in ways similar to, in place of, or sold as, tiger products. The focus on bone products stems from the fact that almost two-thirds of tiger seizure incidents in World WISE from 1999-2018 corresponded to either tiger bone products or tiger medicinal products, which themselves are primarily made from bone.²

Tigers – and tiger products – have been traded continuously since antiquity. They have been traded live, as pets. Their skin, claws, and teeth have been and are still used ornamentally. Various parts, including their bones, have and continue to be used in tonics and medicines in East Asia. While in 1994, a TRAFFIC report concluded that the most serious threat to the tiger’s survival was the trade in parts for medicine,³ more recent reviews have shown that tiger parts (such as meat) and other products (such as bone wine or glue), are now less consumed for medicinal purposes and more as exotic luxury products and tonics.⁴ Poaching for these uses is the greatest threat to tigers across their range.⁵ In addition, tigers have a long history of being hunted due to conflicts with humans and livestock. As a result, they have disappeared from 90 per cent of their original habitat range.⁶

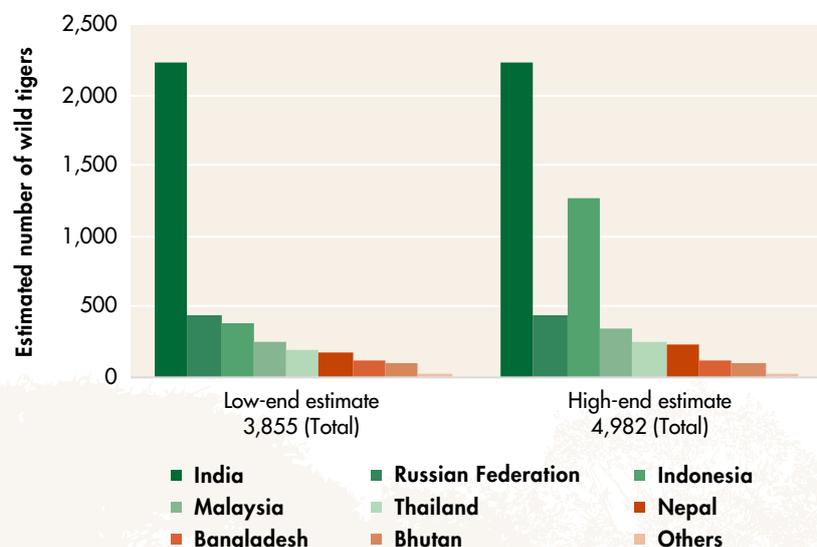
In 2016, there were an estimated 3,855 to 4,982 tigers in the wild, most of which are found in eight countries

(Figure 1).⁷ It is estimated that there are up to three times as many tigers in captivity (estimated at 12,574),⁸ 91 per cent of which are held in 716 facilities in seven countries for which data are available: China, the United States of America, Thailand, Lao People’s Democratic Republic, India, Viet Nam and South Africa (see Table 1). Some of these facilities appear to supply domestic tiger product markets, and some appear to be the source of illegal international trade.

Captive breeding of Appendix I species, such as tigers, for the international commercial trade of these captive-bred species and their parts, is permitted but strictly regulated under CITES⁹ and can only be carried out by facilities registered with the CITES Secretariat.¹⁰ There are no captive tiger facilities registered under this system.¹¹ In 2007, however, the Conference of the Parties agreed in Decision 14.69 that tigers should not be bred for the purpose of commercial

international trade in their parts and voted for “trade”, in the context of this Decision to refer to domestic as well as international trade.¹² Captive breeding of tigers is occurring in several range and non-range States, with the United States, South Africa and Czechia having many captive tigers. Many captive breeding facilities appear to be operated in a manner that would not seem to align with this CITES Decision (14.69).¹³ Breeding of tigers for commercial purposes is thus contrary to this Decision, although this alone may be perfectly legal in some countries according to domestic legislation.¹⁴ Some tiger range countries have legal provisions that permit domestic trade under a permit system.¹⁵ Some non-range states, meanwhile, simply do not have regulations regarding non-native species. Regulations vary widely in what they allow and how and if they are applied. Trading these products across borders, however, is contrary to CITES under national CITES

Fig. 1 Estimates of wild tiger populations in 2015, selected countries



Source: CITES, citing WWF and Goodrich et al 2015*

* CITES CoP18, Doc. 71.1, p. 13 (2019), *Species specific matters: Asian big cats (Felidae spp.): Report of the Secretariat.*

implementation laws. It is this trafficking as well as the trafficking of wild tigers that are the subject of this chapter.

Fieldwork conducted by UNODC in 2019 suggests that some of the data on captive breeding operations obtained through studies commissioned by CITES (Table 1) may have changed over time and suffered from incomplete reporting. For example, it appears that in 2016, there were an estimated 537¹⁷- 700 tigers in captivity in the Lao People’s Democratic Republic,¹⁸ with a decline in 2017 following the disappearance of 300 tigers from just one facility.¹⁹ By 2017 the number of captive tiger facilities in the Lao People’s Democratic Republic had increased from three to four, and by 2018 there were more than 600 tigers in six facilities in the country. Likewise, UNODC fieldwork documented over 450 tigers in South Africa in 2019.²⁰ Numbers in some countries are more difficult to assess because record-keeping is spotty and non-centralised or some tigers are being held in facilities that are unregistered or not open to the public.²¹

When all sources of tigers are combined (wild and captive), China likely has the largest number of living tigers

in the world, followed by the United States, India, and Thailand. The Russian Federation, which does not have a large captive population, has the sixth largest tiger population in the world. The top eight countries hold about 90 per cent of the remaining tigers on earth (Figure 2). All of them, except the United States and South Africa have some indigenous tiger populations. According to the World Wildlife Fund, tiger ownership in the United States appears to be lightly regulated²² as many tigers are privately owned, as pets or in small, unlicensed menageries,²³ with some anecdotal evidence of trafficking to South-East Asia.²⁴ This is not to suggest that captive tigers do or do not have any conservation value per se but rather to point out that these countries with high levels of both wild and domestic tigers are potential sources of tigers for the illegal trade because of existing tiger “supply.”

Sourcing

Assessing the illegal supply of tiger products is complicated by the fact that the species is used in so many forms and that seizures are only a partial picture of the trade since there can be no seizures in countries without adequate laws and enforcement

capacity and limited seizures in countries with weak governance and/or high levels of corruption. Nevertheless, seizures do provide some insight into illegal tiger trafficking when properly contextualized. World WISE contains 1,032 seizure records for tigers from 2007-2018 where the type of product was specified. Of these, 40 per cent involve medicinal products reportedly containing tiger parts. Since these seizures were usually made on the basis of labelling, not forensic analysis, it is unclear how many individual tigers were used in the manufacturing of these products, if any.²⁵ All other types of tiger products account for the remaining 60 per cent of all seized items (Figure 3).

Seizures of live tigers, tiger bodies, rugs, skins, skulls, skeletons and trophies can be most easily analysed so as to represent equivalent numbers of individual tigers involved.²⁶ While the number of animals reflected in seizures of tiger products in these categories in World WISE is relatively small (913 in 1,032 seizures over 12 years),²⁷ based on just these products, the amount seized appears to be rising between 2007 and 2018 (Figure 4). This number should moreover be understood in the context of a small global tiger population

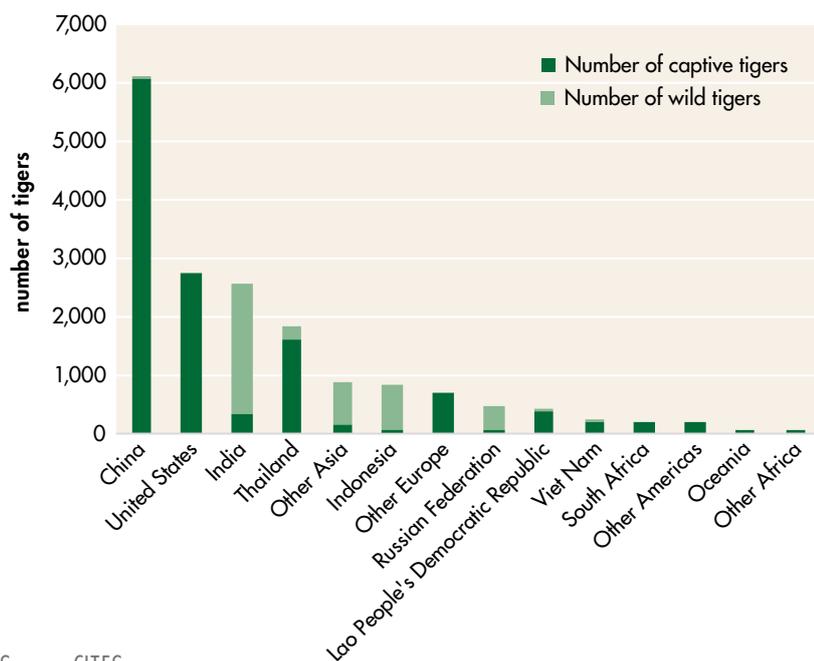
Table 1 | Estimated number of facilities holding tigers and the number of tigers held in the seven countries with the greatest captive tiger populations up to early 2018

COUNTRY	NUMBER OF TIGERS LEFT IN THE WILD ¹⁶	NUMBER OF FACILITIES	NUMBER OF TIGERS HELD IN FACILITIES
China	>7	210	6,057
United States	Not indigenous	355	2,729
Thailand	189-252	46	1,595
Lao People’s Democratic Republic	2	4	380
India	2,226	48	309
Viet Nam	<5	13	186
South Africa	Not indigenous	36	186
61 other countries	–	326	1132
TOTAL	–	1,038	12,574

Source: CITES*

* CITES Seventieth meeting of the Standing Committee, *Review of facilities keeping Asian big cats (Felidae spp.) in captivity*, SC70, Doc. 51, Annex 2 (Rev. 1).

Fig. 2 Estimated number of tigers (wild and captive) by selected country, 2016 or most recent data*



Source: CITES.

* For countries where the number of wild tigers is estimated as a range, a midpoint figure was used for this graph. See: CITES CoP18, Doc. 71.1., p. 13 (2019), *Species specific matters: Asian big cats (Felidae spp.): Report of the Secretariat*.

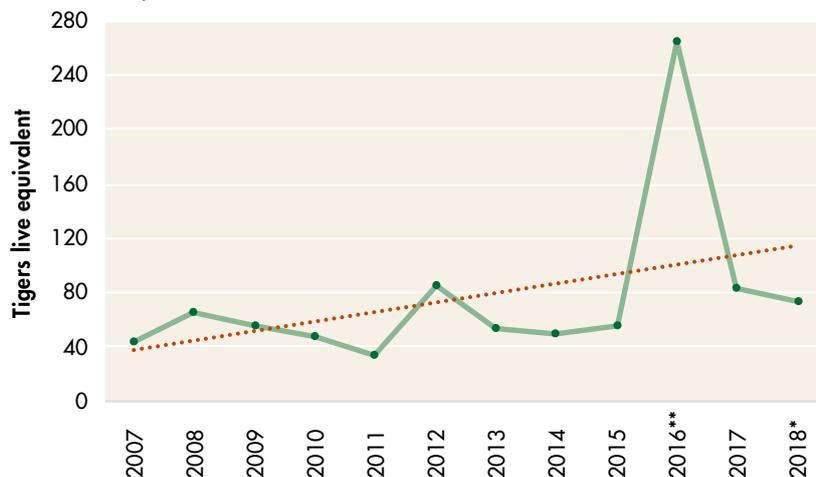
of 3,855-4,892.²⁸ It should also be noted that these seizure data may not be complete, particularly for 2018.²⁹

Looking only at products that convert readily to whole equivalents, it appears from the World WISE data covering 2007-2018 that Thailand and India are the main source countries of shipments seized in international trade, together representing 82 per cent of the total whole tiger equivalents seized where the origin was known (Figure 5).

Thailand has one of the largest captive tiger populations, but fewer than 200 wild tigers, so most of these seizures since 2007 likely involved captive-sourced animals. The Tiger Temple case is one notorious example.³⁰ In India, the opposite is true, with the world's largest wild population and a small captive population with no indicators to suspect captive specimens in trade,³¹ the seized products are more likely from wild animals.

While some research has asserted that tiger products sourced from wild individuals are preferred by

Fig. 4 Number of whole tiger equivalents seized based on reported seizures of products that can easily be converted into an equivalent number of individuals, 2007-2018*



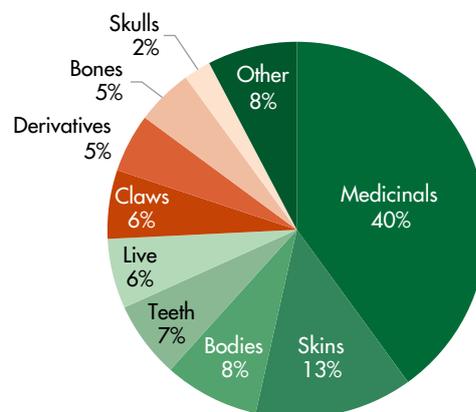
Source: World WISE.

* Included are bodies, live animals, rugs, skeletons, skins, skulls, and trophies. Teeth and claws are excluded. The year 2018 is based on partial data.

** 2016 includes an outlier of considerable size, the Tiger Temple case that occurred in Thailand.

consumers over those from captive animals because they are thought to be more powerful with more effective medicinal properties,³² it is almost impossible for consumers to differentiate between wild and captive animals. Given the current use of other species in products purporting to be tiger, the first concern for

Fig. 3 Share of tiger seizures by type of product 2007-2018*

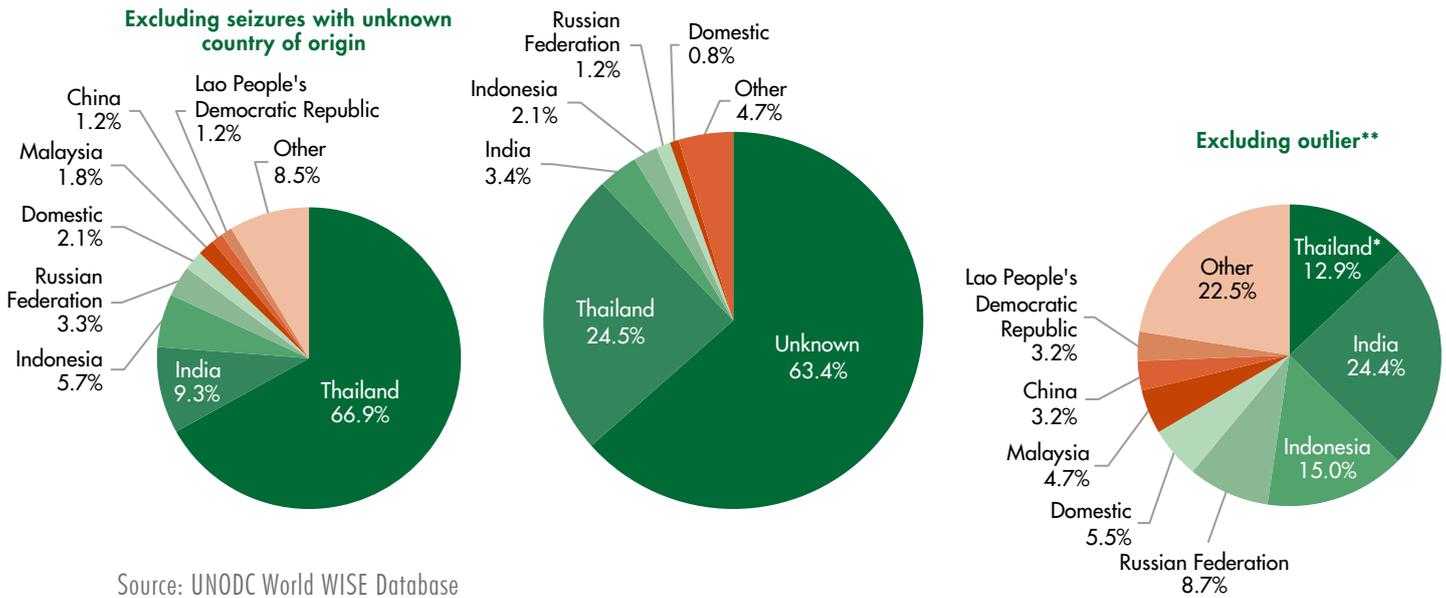


Source: UNODC World WISE Database

* The year 2018 is based on partial data.

consumers is likely whether the product is genuine tiger.³³ This is part of the reason why, for example, whole tiger cubs have been found in large, transparent bottles or jars: they offer proof that the wine contains genuine tiger.³⁴ In addition to tiger products, products containing body parts of other

Fig. 5 Share of reported origin countries for whole tiger equivalents seized globally, 2007-2018*



Source: UNODC World WISE Database

* Included are bodies, live animals, rugs, skeletons, skins, skulls, and trophies. Teeth and claws are excluded. The year 2018 is based on partial data.

** The Tiger Temple case that accounts on its own for 207 tigers (live equivalent) and clearly represents an outlier has been removed, the resulting chart shows that the prominent role of Thailand as a source of illegally traded tiger products is driven by this one single seizure incident of considerable size.

big cat species have been recorded in illegal trade, including leopards, snow leopards, clouded leopards, jaguars, and lions. Some of these products could be passed off as tiger products, particularly bones, teeth, and claws, although some of these species are also illegally traded to consumers seeking these species specifically. Leopard bone was officially recognised as a substitute for tiger bone in China in 1993, when domestic trade in tiger parts was prohibited³⁵ Later, in 2006, the hunting of wild leopards was prohibited, as was the purchase of bones except from official stockpiles.³⁶ In addition to being used in place of tiger bones in traditional medicinal preparations,³⁷ leopard bone products are openly marketed as containing leopard, including in a tonic product known as Hongmao Yaojiu.³⁸

Data on the use of snow leopard as a possible supplemental species to tiger is limited. One case of snow leopard use in Asian medicines was detected through DNA analysis in 2015.³⁹ Snow leopard claws and canines have more recently been advertised as medicine to cure heart and blood vessel ailments.⁴⁰ Given that the term for “leopard” used in traditional

Chinese medicine is not specific and could refer to three species (leopard, snow leopard, and clouded leopard), it remains difficult to parse out the involvement of each in illegal or even legal trade.⁴¹

As for jaguar, the IUCN Red List assessment group noted in 2018, “jaguars are starting to be considered a replacement for tiger bone for traditional medicine purposes by the increasing Asian community in Latin America.”⁴² The CITES Secretariat also has plans to commission a study on the illegal trade in jaguars as it becomes a concern for the species’ survival.⁴³ Jaguar parts appear to be entering the trade when jaguars are killed as menaces to humans and livestock (see box on jaguar canine trade below). World WISE contains records of only 121 seizures of jaguar parts (excluding medicines and derivatives) from 1999 to 2018, including skins or skin pieces (32 per cent of jaguar parts seizures), teeth (18 per cent), and live animals (13 per cent).

As a supplement to the tiger bone supply, African lions appear to be the species of greatest concern (see box 2 below). Nevertheless, greater insight into actual substitution trends between different big cat products is needed to determine its importance as a threat.

Trafficking

There are only 155 cases recorded in World WISE where the citizenship of the tiger traffickers was identified, but of these, 29 per cent were Chinese, 18 per cent Indian, 14 per cent Vietnamese and 8 per cent Indonesian. Research conducted for CITES suggests the trafficking networks for tiger products involve Chinese and Vietnamese traders who sell the products to medicinal industries in China, casino towns bordering China in the Lao People’s Democratic Republic or Myanmar, urban markets in the Lao People’s Democratic Republic, and manufacturers in Viet Nam, or directly to consumers.⁶⁹ They link suppliers in source countries, both poachers and farms, with retailers in consumer countries. Supply chains converge to some extent with traders moving wild and captive-bred tigers



Box 1: Jaguar canines

Although jaguars (*Panthera onca*) are mainly killed in retaliation for conflict with humans and their livestock,⁴⁴ poaching for jaguar parts is a concern across the range states of Latin America (including Belize, Brazil, Costa Rica, Honduras, Panama, Peru and Suriname).⁴⁵

Despite being listed on CITES Appendix I since 1975, jaguar parts have entered illegal trade,⁴⁶ and this appears to be an increasing problem.⁴⁷ While necklaces and keychains made of canines are found in local markets in source countries, local traders have reported increased interest in jaguar parts (including canines) from Asian citizens.⁴⁸ Recognizing the issue in 2018, the Chinese consulate in Santa Cruz (Plurinational State of Bolivia) and the Chinese embassy in Suriname issued advisories, warning Chinese citizens in these countries that jaguar trafficking is strictly forbidden.⁴⁹

Seizures of canines en route to Asia⁵⁰ began as early as 2012-2014.⁵¹ From January 2012 to March 2018, over 1,900 jaguar canines were reported seized.⁵² 34 per cent of these incidents were linked with China and these seizures were 14-fold larger than those meant for the domestic market. The majority of these canines were seized in the Plurinational State of Bolivia.⁵³ Many Bolivian seizures involved postal trafficking, with some seizures made in personal luggage at airports.⁵⁴ It is unclear whether the seized canines originated from Bolivia, or if they were smuggled into Bolivia from neighbouring countries.

In July 2019, representatives from jaguar range states met in Santa Cruz, Bolivia, at a regional seminar on wildlife trafficking. There, they signed a declaration recognizing the jaguar as an integral part of the ecosystem, and that its protection was a regional

responsibility.⁵⁵ The signatories proposed the jaguar as the emblem of the fight against wildlife and forest crime. They highlighted that wildlife trafficking should be considered a serious transnational organized crime that affects sustainable development, communities, and security, and that sharing information, strengthening enforcement capacity, and regional cooperation are critical to halting the trafficking. Like the first regional conference of the Americas on illegal wildlife trade that took place in Lima, Peru in October 2019, such regional commitments to address the poaching and trafficking of protected species raise awareness of the seriousness of these crimes and their wide-ranging impact.

and African lion through their networks.⁷⁰ Two trafficking routes for tigers that have been identified are:

- A trans-Himalayan route sourcing primarily from wild populations in South Asia;⁷¹ and
- Multiple South-East Asian routes through the Mekong Delta making use of captive, as well as wild, tigers.⁷²

Some border areas in South Asia have been identified as hotspots for tiger trafficking based on high seizure rates recorded there.⁷³ From South Asia parts move across the borders of India and Nepal into China, and via the northeast India route to Myanmar. Tiger parts from South Asia and South-East Asia, including from Indonesia move through Myanmar to China. Tiger parts are also trafficked via Myanmar to China via Lao People's Democratic Republic. Tiger parts from Indonesia, Malaysia, Thailand may be trafficked via Lao People's

Democratic Republic to Viet Nam and China⁷⁴. The South-East Asian routes are used to transport captive and wild tigers.⁷⁵ Captive tigers in China and Viet Nam are used for illegal domestic consumption.⁷⁶

Of those seizure cases where the destination was reported (54 cases, 16 per cent of seizures over the period 2007-2018), the most common reported destinations were China, Thailand, and Viet Nam, which together were believed to be the destinations for more than half of the whole tiger equivalents seized.

Destination markets

All parts of the tiger are traded and used, for traditional medicine and for other purposes, but the bones are generally most sought after.⁷⁷ The tiger's strength and power are said to be the reason for its medical properties, with the bones believed to promote healing of bone, joint, and ligament issues

and reduce inflammation.⁷⁸ Tiger bone is used in a variety of forms depending on the location. It is soaked in wine to make tiger wine, boiled down to make glue or cake, and ground into powder for use in pills, plasters, and other manufactured medicinal products.⁷⁹ Of these, tiger wine and tiger glue (also known as *cao*, in Vietnamese, and *gao*, in Chinese) are believed to be the most sought-after products.⁸⁰

Tiger bone is traditionally cleaned and fried in oil or vinegar to remove all flesh and cartilage. It is then ground into powder and mixed with herbs to make pills or added to camphor and menthol to make tiger balm.⁸¹ Reported wholesale prices for tiger bone in South-East Asia ranged from US\$1,200 per kg in 1994, to US\$1,250-3,750 per kg in 2007, to US\$2,260 per kg as of 2014, but prices vary significantly based on the source of information used.⁸² For example, Chinese court records

Box 2: South African lion bones

Sport hunting of lions has been a mainstay of some South African private game reserves for decades. In 1977, African lions were listed on Appendix II, so international trade in all lions requires CITES documentation. As late as 2000, more than 90 per cent of legally exported lion trophies worldwide were wild-sourced according to the CITES Trade Database,⁵⁶ but concern about wild sourcing as well as the profitability of farming other big cats led game ranchers to breed lions for their reserves.⁵⁷ Captive lion populations made possible the hunting of farmed and released animals. By 2015, the total number of lion trophies exported had doubled, but 93 per cent of these trophies came from farmed animals.⁵⁸

Around 2007, further scrutiny of the adverse effects of trophy hunting on lion conservation and restrictions on trophy exports put pressure on game ranchers to find new outlets for their stock, including the international sale of lion bones as a supplement to tiger bones in the trade. These restrictions culminated in the 2016 United States trophy import ban, which significantly affected the sport hunting business in South Africa. A survey of South African lion breeders carried out in 2017 revealed that 79 per cent of respondents were affected by the United States trophy hunting import ban, and that 21 per cent of the respondents had decided to compensate by focusing on the lion bone trade. When asked what they would do if the United States ban was to remain in place, 52 per cent of respondents said they would instead focus on the lion bone trade.⁵⁹

It appears that the first evidence of lion bone use in the production of products marketed for medicinal use or tonics in China was found in 2005, when lion bone was listed as an ingredient in “bone strengthening wine.”⁶⁰ It is unclear whether the consumer was meant to notice this change in bone type, given that the wine bottle was in the shape of a tiger and the name of the product remained similar to tiger bone wine, despite the ingredients listing lion bone. There is also some debate as to whether and/or how much lion bone is

considered a substitute for tiger bone or an additional possible ingredient for medicinal use.⁶¹

Small scale breeding of tigers has existed in South Africa since the 1990s,⁶² but the interest in the bone trade has spurred growth in this industry.⁶³ The current tally is 72 facilities with over 450 captive tigers recorded in South Africa, compared to 363 lion breeding facilities with over 7,000 captive lions.⁶⁴

Lion appears to be the main supplemental species for tiger bone at this point because there is a plentiful supply from South Africa. According to the CITES Trade Database between 2010 and 2018, most legal lion exports fall into three categories:

- ... Live animals, which are shipped to virtually every country in the world, mostly for circuses and zoos;
- ... Hunting trophies, which are also exported to many countries, but particularly to the United States (up until the 2016 ban) and Europe; and,
- ... Skeletons, bones, and bodies which are exported in commercial trade to Southeast Asia (Lao People’s Democratic Republic, Viet Nam and

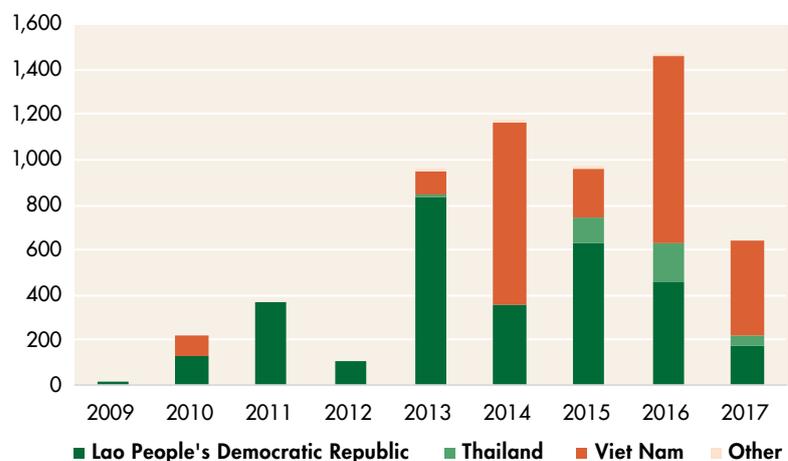
Thailand), presumably for the creation of products like bone glue (Figure 6).⁶⁵

Between 2007 and 2017, about half the legal live trade, over 80 per cent of the trophies, and virtually all the skeletons, bones, and bodies of lions were exported from South Africa.

UNODC fieldwork in South Africa suggests that exporters sometimes illegally combine tiger bones with lion bone exports, the two being difficult to distinguish. Examples of illegal trade in tiger bone from South Africa to Asia have been detected. There have also been instances where tiger and lion bone coming from legal captive-breeding facilities in South Africa have been seized in connection with the same organized criminal group.⁶⁶

A recent CITES study also found indications that much of the lion bone legally imported into South-East Asia was then likely being illegally re-exported internationally. The same study reported multiple court cases relating to “tiger bones” seized from illegal trade in China, which, when tested, turned out to be lion bones.⁶⁷ Chinese court records suggest that lion bones sold as tiger fetch similar prices.⁶⁸

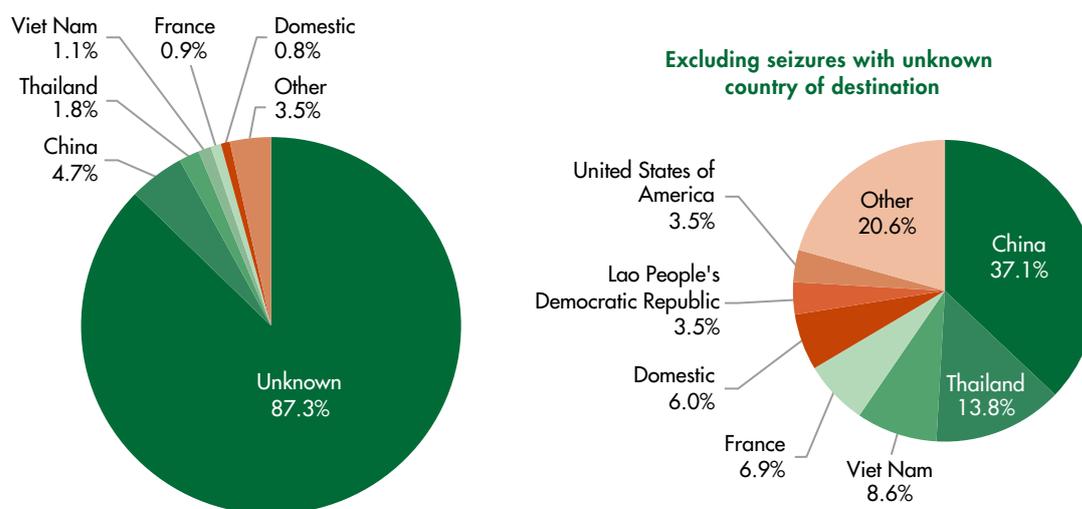
Fig. 6 : Number of lion skeletons legally exported from South Africa by importing country (exporter reported data), 2009-2017*



Source: CITES Trade Database.

* The drop in exports in 2017 is linked to the South African government setting a quota of 800 skeletons, but questions remain as to the exact volume of bones exported.

Fig. 7 Share of reported destination countries for whole tiger equivalents seized globally, 2007-2018*



Source: UNODC World WISE Database

* Includes live, bodies, rugs, skins, skulls, skeletons, and trophies. The year 2018 is based on partial data.

indicate prices of about US\$1,400 per kg in 2015 closer to the retail end of the trafficking chain.⁸³ There are thought to be cultural preferences for certain tiger bone products: use of tiger bone wine is more commonly associated with Chinese culture, while use of tiger glue is associated with Vietnamese culture.⁸⁴

Tiger wine is produced in several ways. The Hunan Sanhong Pharmaceutical Company describes one procedure where tiger bone is crushed into powder and mixed with sorghum liquor.⁸⁵ Other methods include soaking tiger bones in alcohol to produce tiger stock rather than mixing crushed bone (bones are used for a maximum of three batches in this case). Tiger wine is sold in East and South-East Asia for an average of about US\$80 for a bottle aged three years, US\$155 for six years, and upward of US\$290 for an eight-year wine.⁸⁶ In venues where tiger wine is consumed for prestige, bottles can range in price from US\$500 to over US\$1,000 per bottle.

Tiger glue is a concentrated product manufactured by boiling the bones for three to seven days, producing a red-brown substance that is poured into a frame to make a gelatinous cake and cut into bars of approximately

100 grams for sale.⁸⁷ It is often ground into powder or scrapings and consumed with alcohol. Tiger glue bars, weighing about 100 grams, are sold in Viet Nam for about US\$1,000 each.⁸⁸

China is the largest of the three destination markets identified on the basis of seizure records (Figure 7). China implemented a ban on all domestic trade of tiger bone in 1993.⁸⁹ China's national medicine standard for using tiger bone in prepared Chinese medicine was annulled, but leopard bone was permitted as a substitute.⁹⁰ Recently, new regulations concerning tigers have been issued.⁹¹ Despite these regulations, some illegal trade continues, as tiger products repeatedly appear in seizure cases. But more evidence is needed to understand the magnitude of this trade given the limited number of seizure cases where the destination is known (16 per cent of seizures).

Vietnamese law and regulations allow internal trade in wild or captive-bred big cats with a permit from designated authorities (the Provincial People's Committee, which then reports to the Ministry of Agriculture and Rural Development).⁹² Based on interviews in 2019 in Viet Nam, it appears no permits have yet been granted. A new

law is said to be under review that would require all tigers to be registered, with the government surveying all tiger facilities.⁹³ The result of these controls is that few pharmacies, traditional medicine shops, or wildlife markets now openly carry tiger products in Viet Nam.

The same is happening in Thailand.⁹⁴ Tiger glue is sold behind closed doors through acquaintances, only to be discovered during investigations and seizures.⁹⁵ A large part of the trade, though, including the tiger wine and live trade, has shifted to online sales through social media and messaging apps, like Facebook, Instagram, Weibo, Taobao, WhatsApp and We Chat.⁹⁶

Consumer demand profiles for tiger products have started to change, and new forms of demand are emerging. Instead of health, wealth is becoming the primary motivation of consumers. The switch is from tiger meat and tiger wine being consumed only as health products to now also being consumed as exotic luxury products that demonstrate affluence.⁹⁷

In Viet Nam, gifts of tiger products were made to obtain respect from others. 71 per cent of those who

Box 3: Captive breeding facilities in the United States

Around the world, facilities are established to deal with captive populations of endangered species for a variety of reasons, including research, conservation, and entertainment. In the United States, privately-owned commercial entertainment facilities (parks, zoos) in several states have engaged in breeding and crossbreeding of big cats, and some generate over US\$1 million per year while providing opportunities for visitors to take photos when petting and feeding cubs.^a The presence of cubs is a fundamental ingredient for the commercial success of these facilities, but also poses a considerable challenge because cubs are no longer suitable for petting after age two to three months. To reduce the costs of maintaining adult tigers, many are sold, sometimes on the black market to collectors, unaccredited zoos, or are killed by their owners.^b

In the United States, there is no federal law that prohibits the possession and sale of big cats and exotic pets^c, including tigers (*Panthera tigris*) and lions (*Panthera leo*, *Panthera leo melanochaita*). The Animal and Plant Health Inspection Service (APHIS) under the Department of Agriculture (USDA) administers the Animal Welfare Act (AWA) by conducting routine, unannounced inspections of all entities that are registered or licensed under the AWA. The focus of these inspections is on the prevention or cessation of inhumane treatment of animals, as well as

the resolution of trade issues. Violations of AWA are generally handled through civil litigation.^d The Endangered Species Act (ESA) does prohibit the sale across states or the international import/export of listed species and their parts, without a valid ESA permit or registration under the Captive-Bred Wildlife Programme.^e Furthermore, the Lacey Act prohibits the import, export, inter-state commerce and sale of fish, wildlife and plants taken in violation of international laws or laws in the country of origin.

The United States Fish and Wildlife Service (USFWS) is responsible for the enforcement of both the ESA and Lacey Act (in cooperation with other agencies), and it can press criminal charges against those who violate these laws. The current legislative system makes it difficult to address crimes related to possession, captive breeding, and transport of exotic wildlife. The agency responsible for the inspections of these wildlife facilities, the USDA, has a clear focus on animal welfare rather than on crime investigations,^f while at the same time, the agency responsible for wildlife crime investigations – USFWS – is not significantly involved in zoo and other animal commercial entertainment facility inspections as the possession of exotic species does not fall under its remit.

Recent media coverage about one of the most popular exotic animal attractions in the United States – the Greater

Wynnewood Animal Park (or G.W. Exotic) in Oklahoma – re-ignited the debate about the effectiveness of this existing regulatory system. The attraction owner was convicted on eight counts of violating the Lacey Act for falsifying wildlife records and nine counts of violating the ESA in 2019.^g The wildlife offences included the killing of five tigers, the sale or offer for sale of five tiger cubs in interstate commerce, and false documentation hiding the sale of nine lions, three tigers and one lemur. These charges were secondary, however, to the murder-for-hire charges that triggered the prosecution. They were also limited to a timeframe spanning only two months in 2017 when the facility has been in operation since 1997 and under investigation for the past 10 years, including for the death of 23 tiger cubs in 2010.

The Big Cat Public Safety Act^h has been introduced in both houses of the United States Congress. The Act would create an overarching federal law on ownership of big cats as pets and would ban public handling (including cub petting) and prohibit breeding that did not fall under specifically managed Species Survival Planⁱ conservation breeding programs.^j It is currently being considered by the United States Congress to help control the possible exploitation of big cat breeding facilities by organized crime and other black market actors.

a Guynup, S. (2019). Captive tigers in the U.S. outnumber those in the wild. It's a problem. *National Geographic Society*. (Available at: <https://www.nationalgeographic.com/animals/2019/11/tigers-in-the-united-states-outnumber-those-in-the-wild-feature/>).

b Ibid.

c While there is no federal law, 36 states ban the ownership of tigers as pets, but it is possible to obtain a license for breeders and exhibitors to transfer and keep big cats. Four states have no laws on ownership at all, while ten others require permits. Licenses to run establishments that own these animals are issued by Government authorities, often with requirements for regular inspections to ensure compliance with animal welfare standards, regulations for obtaining and disposing of animals, and sanitary and public health standards to, for example, avoid disease transmission (including zoonoses). See National Geographic map on state laws

on keeping big cats as pets retrieved from <https://www.nationalgeographic.com/animals/2019/11/map-shows-tiger-trade-in-united-states-feature/>.

d U.S. Department of Agriculture. *What we do*. (Available at: <https://www.usda.gov/our-agency/about-usda>).

e United States Fish and Wildlife Service. Press release: U.S. *Fish and Wildlife Service Strengthens Protections for Captive Tigers under the Endangered Species Act* (5 April 2016), (available at: https://www.fws.gov/news/ShowNews.cfm?ref=u.s.-fish-and-wildlife-service-strengthens-protections-for-captive-tigers-&_ID=35543).

f U.S. House of Representatives, 116th Congress, 1st Session, Report 116-107. Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Bill, 2020. Pg. 28. (Available at: <https://www.congress.gov/116/crpt/hrpt107/CRPT-116hrpt107.pdf>).

g U.S. Department of Justice. U.S. Attorney's Office, Western District of Oklahoma. Press release. *"Joe Exotic" Sentenced to 22 Years for Murder-For-hire and for Violating the Lacey Act and Endangered Species Act*. (22 January 2020). (Available at: <https://www.justice.gov/usao-wdok/pr/joe-exotic-sentenced-22-years-murder-hire-and-violating-lacey-act-and-endangered>).

h United States Congress, 116th Congress, 2d Session, H.R. 1380, Report 116-430. (Available at: <https://www.congress.gov/bills/116/congress-house-bill/1380/text>).

i Association of Zoos and Aquariums. Species Survival Plan Programs. (Available at: <https://www.aza.org/species-survival-plan-programs>).

j Norton, Kara Jamie. (6 April 2020). The Truth about "Tiger King" and Cats in Captivity. (Available at: <https://www.pbs.org/wnet/nature/blog/the-truth-about-tiger-king-and-cats-in-captivity/>).

used tiger products purchased them for medicinal uses (83 per cent of purchases were for tiger glue).⁹⁸ Purchasers reported buying primarily for themselves or for close family in equal proportion, purchasing for family members to gain their respect.⁹⁹ There was also a recent trend toward using big cat tooth and claw jewellery among young men, sometimes made of other species than tiger.¹⁰⁰

Thai consumers, on the other hand, tended to buy tiger products for spiritual reasons and because they believed these products would provide protection (86 per cent),¹⁰¹ with less than half of consumers buying for status reasons. These purchases were mainly in the form of spiritual items and amulets, oftentimes blessed by a Buddhist monk, despite a strict 2014 prohibition against the use of tiger

parts in amulets from the Sangha Supreme Council, the governing body of the Buddhist order of Thailand.¹⁰² This prohibition is in keeping with the fact that tiger products are not formally included in the Thai traditional medicine practice.¹⁰³

Table 2 | Tiger body parts utilized for healing and preventive medicine in Asia

TIGER DERIVATIVE	EXAMPLE USES
<i>Bone plasters</i>	Aches and pain, bone and joint conditions (for example, arthritis, rheumatism), replenish calcium, anti-inflammatory, treat osteoporosis
<i>Bone wine</i>	Aches and pain, bone and joint conditions (for example, arthritis, rheumatism), replenish calcium, anti-inflammatory, treat osteoporosis, increase sexual capacity, paralysis
<i>Bone gelatine “cake”/“glue” (cao in Viet Nam)</i>	Give strength, arthritis
<i>Penis</i>	Increase sexual performance, treat impotence
<i>Fat</i>	Vomiting, dog bites, bleeding haemorrhoids, scalp ailments in children
<i>Skins</i>	Clothing, magical amulet, trophies, decoration, treat mental illness
<i>Claws</i>	Magical amulet, jewellery to ward off common cold
<i>Teeth</i>	Magical amulet, rabies, asthma, sores on the penis, diabetes
<i>Whiskers</i>	Tooth ache
<i>Eyeballs</i>	Epilepsy, malaria, nervousness of fever in children, convulsions, cataract
<i>Nose</i>	Epilepsy, children’s convulsions
<i>Tail</i>	Skin disease
<i>Brain</i>	Decrease laziness, heal pimples
<i>Lung</i>	Relieve cancer
<i>Testes</i>	Tuberculosis of lymph nodes
<i>Blood</i>	Strengthening the constitution and willpower
<i>Bile</i>	Convulsions in children
<i>Stomach</i>	Calming upset stomachs
<i>Gallstones</i>	Weak or watering eyes, abscesses on the hand
<i>Meat</i>	Nausea, malaria, improving vitality, tonifying the stomach and spleen
<i>Paws</i>	Arthritis, improve general health
<i>Hair</i>	Drives away centipedes when burnt

Source: CITES SC70 Doc. 54.1, Annex

Box 4: Cheetahs

Cheetahs (*Acinonyx jubatus*) are highly sought-after luxury pets, popular in the Arabian Peninsula. Despite being listed on CITES Appendix I since 1975,^a seizures of trafficked cheetahs do occur. World WISE data includes only 19 seizures from 2005-2019, amounting to 65 live seized cheetahs. To account for a lack of data, seizure data provided by the Cheetah Conservation Fund have been added to these World WISE seizures. Together, these data provide a more complete picture of the live cheetah trade: 144 live cheetah seizures from 2005 to 2019, accounting for 213 live seized cheetahs.^b These numbers do not include domestic seizures or seizures for the skin trade, which are some of the additional threats to the species. The main countries of origin for these shipments (known in 62 per cent of cases), were Ethiopia (67 cheetahs) and Somalia (32 cheetahs). The destination for 69 per cent of the seized cheetahs was

unknown, but it is worth noting that of these seizures, Somalia (including Somaliland) seized 111 cheetahs and the United Arab Emirates seized 53 between 2005 and 2019.

Prices for a live cheetah on the black market can reach up to US\$15,000, which is 50 times what illegal traders in Africa receive (anywhere from US\$200 to 300).^c The survival rate of cheetahs, both adults and cubs, in the illegal trade is quite low, between 30 to 52 per cent.^d Juvenile mortality is even higher, as many as five out of six cubs taken from the wild will die before they reach their final destination^e and many kept as pets will die due to the fact that most owners do not know how to properly care for them, generating an ongoing demand for new individuals.^f Given the ongoing risks to cheetahs from habitat loss, human-wildlife conflict, and poaching, and their significant decline in popula-

tion from an estimated 14,000 in 1975 to 7,100 in 2016, the illegal trade is a significant threat.^g

At the 70th meeting of the CITES Standing Committee in 2018, Ethiopian, Kenyan and Yemeni authorities noted^h that the illegal trade spans a far wider range of countries and that its volume is largely underestimated, posing a significant threat to wild populations.ⁱ In 2014, experts suspected that some South African breeding facilities were laundering wild-sourced cheetahs as captive-bred.^j In 2016, CITES recognized that South African breeding operations had made significant strides in improving regulations, including requiring parental DNA as proof of captive-breeding for specimens to be exported as captive-bred. Since then seizures continue to suggest ongoing illegal trade but data is scarce on its extent and modus operandi.

a Commercial trade in wild cheetahs has been prohibited since 1975; however, there is an annual export quota in place for three countries pertaining to trophies and live trade (5 from Botswana, 50 from Namibia and 150 from Zimbabwe). See CITES Appendix I (available at: <https://www.cites.org/eng/app/appendices.php>); UNEP-WCMC, *The Species+ website* (available at: www.speciesplus.net).

b World WISE data were supplemented with seizure records provided by the Cheetah Conservation Fund (CCF). Only verified seizures with animals recorded present at CCF safehouses where included in the analysis. Animals that died during confiscation and on route to a safehouse were included. The source country was known for 71% of these seizures (155 cheetahs) and the destination was known only for 18% (38 cheetahs).

c Tricorache, P., Nowell, K., Wirth, G., Mitchell, N., Boast, L.K. and Marker, L. (2018). Pets and pelts: understanding and combating poaching and trafficking in cheetahs. In: L. Marker, L.K. Boast & A. Schmidt-Küntzel (Eds.), *Biodiversity of the World: Cheetahs: Biology and Conservation* (pp. 191 – 203). San Diego: Elsevier.

d Durant, S., Mitchell, N., Ipavec, A., and Groom, R., *Acinonyx jubatus. The IUCN Red List of Threatened Species*

2015: e.T219A50649567 (2015) (available at: <https://www.iucnredlist.org/species/219/50649567>); CITES. (2014). Interpretation and implementation of the Convention Species trade and conservation. *Illegal Trade in Cheetahs (Acinonyx jubatus)*. Submitted by the Secretariat. Sixty-fifth meeting of the Standing Committee Geneva (Switzerland), 7-11 July 2014. *SC65 Doc. 39* (Rev. 2). Retrieved from: <https://cites.org/sites/default/files/eng/com/sc/65/E-SC65-39.pdf>

e Ferard, E., 'The success of cheetahs as pets is threatening the survival of the species,' (unofficial translation from the French original) *Geo*, January 2019 (available at: <https://www.geo.fr/environnement/le-succes-des-guepards-comme-animal-de-compagnie-menace-lavenir-de-lespece-194274>).

f Durant et al. 2015, op. cit; Tricorache et al. 2018, op. cit.

g Durant et al., 'The global decline of cheetah *Acinonyx jubatus* and what it means for conservation', *Proceedings of the National Academy of Sciences of the United States of America*, 114(3), 528-533, 2017; Durant, S., Mitchell, N., Ipavec, A., and Groom, R., *Acinonyx jubatus. The IUCN Red List of Threatened Species 2015*: e.T219A50649567 (2015) (available at: <https://www.iucnredlist.org/species/219/50649567>).

h CITES Seventieth meeting of the Standing Committee (SC70), Inf. 44, *Supplemental information on illegal trade in cheetah (acinonyx jubatus)*, 2018.

i CITES (2018a). Report by Kristin Nowell, CAT, & IUCN SSC Cat Specialist Group. Implementation of CITES Decision 17.228: Review of implementation of Resolution Conf. 12.5 (Rev. CoP17) on *Conservation of and Trade in Tigers and Other Appendix-I Asian Big Cats*. Report for the 70th meeting of the CITES Standing Committee, Sochi, Russia, October 1-5, 2018; CITES SC70 Doc 54.1 Annex.

j CITES, *Interpretation and implementation of the Convention Species trade and conservation: Illegal Trade in Cheetahs (Acinonyx jubatus)*, SC65 Doc. 39 (Rev. 2). (available at: <https://cites.org/sites/default/files/eng/com/sc/65/E-SC65-39.pdf>); Durant et al. 2015, op. cit; Marnewick, K., Beckhelling, A., Cilliers, D., Lane, E., Mills, G., Herring, K., Caldwell, P., Hall, R., and Meintjes, S., 'The status of the cheetah in South Africa', *Cat News Special Issue 3*, 22-31, 2007; Klein, R., 'Status report for the cheetah in Botswana', *Cat News Special Issue 3*, 14-21, 2007.

Endnotes

- 1 That is, all species of the genus *Panthera* including tigers, Asian lions, leopards, clouded leopards, and snow leopards. Most *Panthera* species were placed on Appendix I in 1975, the exceptions being lions (*Panthera leo*) and one subspecies of tiger (Siberian tiger, *Panthera tigris tigris*, formerly *Panthera tigris altaica*), which was later included in 1987. Asian lions (*Panthera leo persica*) were up-listed to CITES Appendix I in 1977. Currently African lions (*Panthera leo leo*) remain on CITES Appendix II with an annotation.
- 2 CITES also noted the importance of the skin trade for tigers, although World WISE data does not reflect this. See: See CITES, Sixty-fifth meeting of the Standing Committee, Interpretation and implementation of the Convention: Species trade and conservation: Asian big cats, SC65, Doc. 3, (available at <https://cites.org/sites/default/files/eng/com/sc/65/E-SC65-38.pdf>).
- 3 Mulliken, T. and Hayward, M., 'Recent data on trade in rhino and tiger products, 1988-1992', *TRAFFIC Bulletin*, 14(3), pp. 99-106, 1994.
- 4 CITES, Sixty-fifth meeting of the Standing Committee, *Interpretation and implementation of the Convention: Species trade and conservation: Asian big cats*, SC65, Doc. 38, para. 6.; CITES CoP18, Doc. 71.1., p. 13 (2019), *Species specific matters: Asian big cats (Felidae spp.): Report of the Secretariat*.
- 5 Goodrich, J., et al., *Panthera tigris*, *The IUCN Red List of Threatened Species 2015*: e.T15955A50659951 (2015). (Available at: <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T15955A50659951.en>).
- 6 Ibid.
- 7 CITES Seventieth meeting of the Standing Committee, *Species specific matters: Asian big cats (felidae spp.): Report of the Secretariat*, SC70, Doc. 51, Annex 4.
- 8 CITES Seventieth meeting of the Standing Committee, *Review of facilities keeping Asian big cats (Felidae spp.) in captivity*, SC70, Doc. 51, Annex 2 (Rev. 1) (available at: <https://cites.org/sites/default/files/eng/com/sc/70/E-SC70-51-A2-R1.pdf>).
- 9 In accordance with CITES, Appendix I animal species bred in captivity for commercial purposes shall be deemed to be specimens of species included in Appendix II (see Article VII, paragraph 4, of the Convention). Therefore, trading in captive bred Appendix I species, such as big cats, is permitted under CITES. In 2007, however, the CITES Conference of the Parties decided that tigers should not be bred for the purpose of trade in their parts and derivatives. CITES Decision 14.69, on captive-bred and ranches specimens, was directed to the Parties, especially Appendix I Asian big cat range States, and reads as follows, "Parties with intensive operations breeding tigers on a commercial scale shall implement measures to restrict the captive population to a level supportive only to conserving wild tigers; tigers should not be bred for trade in their parts and derivatives." Violation of this directive does not carry criminal penalties unless supported by national legislation. Decision 14.69 is still valid.
- 10 CITES. *Registration of operations that breed Appendix-I animal species in captivity for commercial purposes*, Conf. 12.10 (Rev. CoP15) (available at: <https://cites.org/sites/default/files/document/E-Res-12-10-R15.pdf>); CITES Sixty-fifth meeting of the Standing Committee, *Review of implementation of resolution conf. 12.5 (rev COP16) on conservation of and trade in tigers and other appendix-I Asian big cat species*, SC65, Doc. 38, Annex 1, (available at: https://cites.org/sites/default/files/eng/com/sc/65/E-SC65-38-A01_0.pdf).
- 11 Ibid.
- 12 CITES Fourteenth Meeting of the Conference of the Parties, *Summary record of the 14th session of Committee II*, CoP14 Com. II Rep. 14 (Rev. 1), (available at: <https://www.cites.org/sites/default/files/eng/cop/14/rep/E14-Com-II-Rep-14.pdf>).
- 13 The CITES Secretariat refers to this misalignment in CITES SC70 Doc. 51 and again in CITES CoP18 Doc 71.1.
- 14 Wildlife crime related to CITES trade violation is clearly defined by CITES requirements, but outside trade violations, wildlife crime varies from country to country and some actions involving wildlife may be a criminal offence in one country but not in another. CITES Decision 14.69, on captive-bred and ranches specimens, was directed to the Parties, especially Appendix-I Asian big cat range States, and reads as follows, "Parties with intensive operations breeding tigers on a commercial scale shall implement measures to restrict the captive population to a level supportive only to conserving wild tigers; tigers should not be bred for trade in their parts and derivatives." Violation of this directive does not carry penalties unless national legislation specifically criminalizes it.
- 15 See annex 5 of <https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-071-01.pdf>, paragraph 2 commencing "Legislation and administrative regulations are in place to regulate the management of those facilities and the trade in those big cats, their products and derivatives originated from them."
- 16 Ibid.
- 17 CITES Secretariat. 2017. Application of Article XIII in the Lao People's Democratic Republic. SC69 Doc.29.2.1 (page 5-6). (Available at: <https://cites.org/sites/default/files/eng/com/sc/69/ESC69-29-02-01.pdf>); Wildlife Justice Commission (WJC). 2016. Operation Ambush. Available at: https://wildlifejustice.org/wp-content/uploads/2016/10/WJC-Ambush-Briefing_Public.pdf).
- 18 Reference from the intervention of the delegation of Lao People's Democratic Republic at the 17th CoP to CITES, 2016.
- 19 CITES Secretariat. 2017. Application of Article XIII in the Lao People's Democratic Republic. SC69 Doc.29.2.1
- 20 UNODC fieldwork, see Methodological Annex.
- 21 See Methodological Annex for details. This lack of regulation increases the risk that organized crime can profit from the captive tiger trade as noted by the U.S. Department of the Treasury when they sanctioned the Zhao Wei Transnational Criminal Organization. See U.S. Department of the Treasury. (January 30, 2018). *Treasury sanctions the Zhao Wei Transnational Criminal Organization*. (Available at: <https://home.treasury.gov/news/press-releases/sm0272>).
- 22 Prior to 2016, regulations did not protect or regulate ownership of hybrid tiger species, but the United States Fish and Wildlife Service has now tightened these regulations and hybrids must now be registered as well. U.S. Fish & Wildlife Service. *Questions and answers U.S. captive-bred inter-subspecific crossed or generic tigers final rule*, (available at: <https://www.fws.gov/home/feature/2016/pdfs/Generic-Tiger-Final-Rule-FAQs.pdf>).
- 23 World Wildlife Fund (WWF), *More Tigers in American Backyards than in the Wild*, 29 July 2014. (Available at: <https://www.worldwildlife.org/stories/more-tigers-in-american-backyards-than-in-the-wild#>).
- 24 For instance, a resident of New York in 2018 admitted during court proceedings having purchased and exported from the United States to Thailand an assortment of endangered species parts corresponding to a market value of US\$150,000 (Department of Justice, US Attorney General Office. 1 August 2018. *New York Man Sentenced To Prison For Trafficking In Endangered Lion And Tiger Parts*).
- 25 For example, World WISE contains seizures of a product known as "Jian Bu Hu Qian Wan", which contains nine ingredients, including "Os Tigris," aimed at treating a wide range of maladies. It is unclear what portion of these seizures is tiger bone. Forensic tests of natural supplements in the West have often found little or none of the active ingredient claimed. See, for example, Newmaster, S. G., Grguric, M., Shanmughanandhan, D., Ramalingam, S. and Ragupathy, S., 'DNA barcoding detects contamination and substitution in North American herbal products', *BMC Medicine*, Vol. 11, p. 222, 2013.
- 26 Each live tiger, body, skin, skull, skeleton, and trophy was counted as one tiger. In World WISE, seizures marked are skeletons are meant to be whole skeletons meaning that adding skulls in this analysis is unlikely to double count. Furthermore, skull seizures make up only a fraction of cases limiting any risks from possible double counting. While double counting with skins and skeletons is also possible, World WISE data appears to under-represent skins compared to other public data sources, meaning this possible duplication would also be limited.
- 27 Data from EIA's database of tiger seizures were included in this sample if cases met the following criteria: confirmed seizures with a specific date and location.
- 28 CITES Seventieth meeting of the Standing Committee, *Species specific matters: Asian big cats (felidae spp.): Report of the Secretariat*, SC70, Doc. 51, Annex 4.
- 29 Other sources report a higher number of seized tigers over the same period. (See,

- among others, TRAFFIC. 2019. Skin and Bones: Unresolved. An analysis of tiger seizures from 2000-2018. Available from: <https://www.traffic.org/publications/reports/skin-and-bones-unresolved/>; <https://eia-international.org/wildlife/wildlife-trade-maps/illegal-trade-seizures-asian-big-cats/>).
- 30 CITES. (2019). Species specific matters Asian big cats (Felidae spp.) *Report of the Secretariat. Eighteenth meeting of the Conference of the Parties Colombo (Sri Lanka), 23 May – 3 June 2019*. CoP18 Doc. 71.1. Annex 4. Available at: <https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-071-01.pdf>.
- 31 According to CITES Seventieth meeting of the Standing Committee, *Review of facilities keeping Asian big cats (Felidae sp.) in captivity*, SC70, Doc. 51, Annex 2 (Rev. 1), there are 309 tigers in captivity in India.
- 32 Taweekan, J. and De Guzman, E., *Consumer research findings on ivory and tiger products in Thailand*, info sheet, USAID, 2018 (available at: https://www.usaidwildlifeasia.org/resources/reports/infosheet-thailand-ivory-and-tiger_4june2018_eng_final.pdf/view).
- 33 UNODC field work, see Methodological Annex.
- 34 UNODC fieldwork, see Methodological Annex.
- 35 CITES CoP 14, Doc. 52, Annex 1, *Report on implementing resolution Conf.12.5 of CITES: Asian big cats*, 2007.
- 36 China State Food and Drug Administration (SFDA), 'Notification on the management of the use of leopard bones', *State Food and Drug Administration note [2006] No. 118*, 2006.
- 37 China Medicinal Science and Technology Publishing House. 2020. Pharmacopoeia of the People's Republic of China, 2020 edition, part 1.
- 38 CITES (2018a). Report by Kristin Nowell, CAT and IUCN SSC Cat Specialist Group. Implementation of CITES Decision 17.228: Review of implementation of Resolution Conf. 12.5 (rev. CoP17) on *Conservation of and Trade in Tigers and Other Appendix-I Asian Big Cats*. Report for the 70th meeting of the CITES Standing Committee, Sochi, Russia, 1-5 October 2018.
- 39 Coghlan, M.L., Maker, G., Crighton, E., Haile, J., Murray, D.C., White, N.E., Byard, R.W., Bellgard, M.I., Mullaney, I., Trengove, R., Allcock, R.J.N., Nash, C., Hoban, C., Jarrett, K., Edwards, R., Musgrave, I.F., and Bunce, M., 'Combined DNA, toxicological and heavy metal analyses provides an auditing toolkit to improve pharmacovigilance of traditional Chinese medicine (TCM)', *Scientific Reports*, 5(1), pp. 1-9, 2015.
- 40 Nowell, K., Li, J., Paltsyn, M., Sharma, R.K. (2016, October). An ounce of prevention: Snow leopard crime revisited. TRAFFIC: Cambridge, UK.
- 41 Theile, S., *Fading footsteps: The killing and trade of snow leopards*, TRAFFIC International, 2003; Nowell, K. and Xu, Ling, *Taming the tiger trade: China's markets for wild and captive tiger products since the 1993 domestic trade ban*, TRAFFIC East Asia, 2007.
- 42 Quigley, H., Foster, R., Petracca, L., Payan, E., Salom, R. and Harmssen, B., *Panthera onca* (errata version published in 2018), The IUCN Red List of Threatened Species 2017: e.T15953A123791436 (Available at: <https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T15953A50658693.en>).
- 43 CITES decision 18.251. (Available at: <https://cites.org/eng/dec/valid17/82250>).
- 44 Adrian Reuter, Leonardo Maffei, John Polisar, and Jeremy Radachowsky, *Jaguar Hunting and Trafficking in Mesoamerica: Recent observations*. New York: Wildlife Conservation Society, 2018. Data from three countries (Belize, Costa Rica, and Panama) in this study, though, did suggest that a formal international trade may be emerging.
- 45 Reuter et al (2018); Berton (2018); Verheij, P. (2019). An assessment of wildlife poaching and trafficking in Bolivia and Suriname. Amsterdam, Netherlands: IUCN.
- 46 Reuter et al (2018); Verheij, P. (2019).
- 47 Morcatty et al (2020). Illegal trade in wild cats and its link to Chinese-led development in Central and South America. *Conservation Biology*, doi: 10.1111/cobi.13498.
- 48 Reuter et al (2018).
- 49 Embassy of the People's Republic of China in the Republic of Suriname. (2018). Remind Chinese citizens in Suzhou not to buy or carry wild animal products such as tiger teeth (*Panthera*). (Available from: www.sr.chineseembassy.org/chn/lsw/GY216/t1537671.htm); Consulate General of the People's Republic of China in Santa Cruz. (2018). Santa Cruz's overseas Chinese community issued a joint statement on the suspected illegal sale of wild protected animal products such as jaguars. (Available from: <http://santacruz.chineseconsulate.org/chn/lgdt/t1540116.htm>).
- 50 With a known final destination in Asia as declared by seizing authorities.
- 51 Morcatty et al (2020); Verheij, P. (2019).
- 52 Morcatty et al (2020).
- 53 The two largest seizures occurred at a private residence of a Chinese national in December 2014 (300 teeth and other wildlife products) (Ministerio de Medio Ambiente y Agua (MMAyA). (July 3, 2019). Aprehended a sentenciado por tráfico ilegal de colmillos de jaguar y lo trasladan a la cárcel de Mocovi. (Available from: <https://www.mmaya.gob.bo/index.php/noticias/Aprehended-a-sentenciado-por-trfico-ilegal-de-collmillos-de-jaguar-y-lo-trasladan-a-la-crcel-de-Mocovi,-2413.html>); Choque M. (2015). Mercado negro de colmillos (Fangs black market). La Razón. (Available from: http://www.la-razon.com/suple-mentos/informe/Mercado-negro-collmillos-informe_0_2254574635.html) and from a restaurant with owners of Chinese origin in February 2018 (185 canines, 8 molars, 2 claws and 3 skins) (MMAyA, 2018). The largest airport seizures occurred in August 2014 at El Alto Airport in Bolivia (8 packages containing 60 loose canines, 40 canine necklaces and 2 jars with canines) on route to China (Verheij, 2019) and in 2015 at Beijing Capital International Airport in China (119 Jaguar canines and 13 claws) (Beijing Morning Post, 2015; Verheij, 2019). Beijing Morning Post. (2015). Man returned to China with more than 100 American leopard teeth. Beijing Morning Post. Available from: <https://new.qq.com/cmsn/20160221/20160221001007>.
- 54 Navia (2018); Verheij (2019).
- 55 Manifiesto "Alianza contra el tráfico ilegal del jaguar." Signed by the representatives of Argentina, Bolivia, Costa Rica, Ecuador, Paraguay, and Peru with observers from CITES, UNODC, and INTERPOL on July 25, 2019.
- 56 CITES Seventieth Meeting of the Standing Committee, *Species specific matters: African lion (Panthera leo): Report of the Secretariat and the animals committee*, SC70 Doc. 54.1, Annex, 2018.
- 57 Williams, V.L. and 't Sas-Rolfes, M. J., 'Born captive: A survey of the lion breeding, keeping and hunting industries in South Africa', *PLoS ONE*, 14(5), e0217409, 2019.
- 58 CITES Seventieth Meeting of the Standing Committee, *Species specific matters: African lion (Panthera leo): Report of the Secretariat and the animals committee*, SC70 Doc. 54.1, Annex, 2018.
- 59 Williams, V.L. and 't Sas-Rolfes, M., *South African lion bone trade: A collaborative lion bone research project (Interim Report 1)*, South African National Biodiversity Institute, 2017 (available at: https://conservationaction.co.za/wp-content/uploads/2018/07/2017_Interim-Report-1.pdf).
- 60 Nowell, K. and Xu, Ling, *Taming the tiger trade: China's markets for wild and captive tiger products since the 1993 domestic trade ban*, TRAFFIC East Asia, 2007.
- 61 CITES Seventieth Meeting of the Standing Committee, *Species specific matters: African lion (Panthera leo): Report of the Secretariat and the animals committee*, SC70 Doc. 54.1, 2018.
- 62 Environmental Investigation Agency (EIA)/Wildlife Protection Society of India (WPSI), *Skinning the cat: crime and politics of the big cat skin trade*, 2006; Nowell, K., *Far from a cure: The tiger trade revisited*, TRAFFIC, 2000; Nowell, K. and Xu, Ling, *Taming the tiger trade: China's markets for wild and captive tiger products since the 1993 domestic trade ban*, TRAFFIC East Asia, 2007.
- 63 UNODC fieldwork, see Methodological Annex.
- 64 According to the CITES Management Authority of South Africa as of March 2019.
- 65 A mismatch exists between reported export and import records, suggesting a discrepancy in the recording and possibly illegality in the legal trade.
- 66 According to the CITES Management Authority of South Africa as of March 2019. Also, Bloch, S., 'Alleged key player in lion bone syndicate in court after

- handing himself over to police', *News24*, 27 November 2018.
- 67 CITES. (2018). African lion (*Panthera leo*) - Report of the Secretariat and the Animals Committee. CITES SC70 Doc. 54.1.
- 68 A 2016 case of lion bone sold as tiger quoted a price of US\$1500 per kg of lion bone (closer to the retail end of the trafficking chain) compared to genuine tiger bone sold for US\$1400 per kg in 2015. China Court Record. 2018. Hekou Yao Autonomous County People's Court, Yunnan Province (2018). First instance judgment in the case of illegal purchase, transport and sale of precious and endangered wild animals and the products of precious and endangered wild animals by He Jianming and Liang Dilong; China Judgements Online. 2016. First instance judgment in the case of illegal purchase, transport and sale of precious and endangered wild animals and the products of precious and endangered wild animals by Zhao Lei and Lao Tongzai. Available at: <http://wenshu.court.gov.cn/content/content?DocID=369fb126-5e8d-42b0-9532-5d73f3fc44bf>.
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