

PANGOLINS

ON THE BRINK

WILDAID



▲
Temminck's Ground
Pangolin, Namibia.
Scott Hurd

ABOUT WILDAID

WildAid's mission is to end the illegal wildlife trade in our lifetimes. We envision a world where people no longer buy wildlife products such as shark fin, elephant ivory and rhino horn. With an unrivaled portfolio of celebrity ambassadors and global network of media partners, WildAid leverages nearly US \$200 million in annual pro bono media support with a simple but powerful message:

“WHEN THE BUYING STOPS, THE KILLING CAN TOO.”

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Cover Sunda Pangolin. Paul Hilton/
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Back Cover: Thousands of dead pangolins lie in a pit before being burned following the April 2015 bust in Medan, Indonesia. Paul Hilton/WCS

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EXECUTIVE SUMMARY

It may come as a surprise to most people that the world's most illegally traded mammal—far surpassing the poaching and trafficking rates of elephants, rhinos and other high-profile species—is a solitary, nocturnal, scale-covered creature they've likely never heard of: the pangolin, commonly known as the “scaly anteater.”

It is estimated that more than 1 million pangolins have been taken from the wild in the past decade or so, making them the world's most-trafficked wild mammal.¹ Overexploited by illegal trade in their keratin scales for medicine and as an exotic meat, conservationists agree that swift action is required to save these animals.

Over the past several years, seizures of scales and of whole pangolins, both live and frozen, have increased. Seizures of products originating from African nations, including South Africa, Cameroon, Nigeria, Sierra Leone and Uganda show that Asian markets are now sourcing African species to meet demand in China and Vietnam. Overwhelming evidence indicates that trafficking follows some of the same routes as that of elephant ivory and rhino horn. Some of the same criminals profiting from these trades are now shipping tons of pangolin scales to Asia.

In 2008, two of the eight species were classified as Endangered by the IUCN—the Sunda Pangolin *Manis javanica* and the Chi-



nese Pangolin *M. pentadactyla*. Less than a decade later all eight are now threatened with extinction, with the above Critically Endangered, the Indian and Philippine Endangered, and all four African species Vulnerable.

The International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC) Pangolin Specialist Group recognized hunting and poaching of pangolins, largely for illegal international trade—the majority of which is destined for China and Vietnam—as their primary threat.²

Pangolins are nocturnal and solitary, particularly vulnerable to poaching pressures because of their slow reproductive rate, sensitivity to capture-induced stress and instinct to curl into a ball when threatened, rather than try to escape. Their elusive nature has made it difficult to estimate how many still exist in the wild. However, hunters, traders and locals have reported drastic declines in sightings of Asian species across different parts of their range. Interviews with hunters in 2007 and 2011 suggested populations of the Sunda Pan-

golin in Peninsular Malaysia have fallen dramatically, with 95% of hunters recognizing severe declines, especially since 1990, when the commercial trade began to escalate.³ The rarity of sightings in the wild, coupled with the massive volume of scales and carcasses seen in trade over the past decade, suggests that all eight species may be on the brink of extinction.

Vietnam's and China's rapidly emerging middle class is driving the illegal trade. Pangolin meat has become a luxury item and status symbol, consumed by business leaders and government officials. Despite an absence of scientific evidence to support the alleged curative properties, 70% of Chinese citizens believe pangolin products have medicinal value, as they use scales to “cure” rheumatism, skin disorders and wound infections.⁴ Meanwhile, China has distributed legal prescription medicines containing pangolin scale derivatives, utilizing ~25 tonnes each year since 2008, sourced from a stockpile of unknown size, and effectively perpetuating unproven medicinal beliefs: Sixty-six percent of Chinese



It is estimated that more than 1 million pangolins have been taken from the wild in the past decade, making them the most trafficked wild mammal in the world.

residents have purchased government approved medicines.⁵ In Vietnam, just 8% of residents believe pangolins have medicinal properties, but an additional 64% are currently undecided; they have heard scales can be used to increase libido, cure rheumatism, asthma, and even cancer, but don't know if such claims are true. Yet despite such widespread use, 96% of Chinese and 98% of Vietnamese residents believe pangolins deserve to exist on earth.⁶

Highly specialized diets combined with weak immune systems and extreme sensitivity to capture-induced stress mean pangolins do not do well in captivity, with records showing the majority of individuals die within the first three years. The 100 zoos and organizations that have tried to sustain the animals over the past 150 years have recorded mortality rates up to 70% in the first year.⁷ These characteristics demonstrate that commercial breeding is not a viable option to supply the medicinal trade. While farming has been introduced to supplement wild populations of some species whose body parts are prized in traditional medicines, this is not a possibility for pangolins, and therefore the only way forward is to reduce hunting and the demand for their meat and scales.

In order for pangolins to survive, they require greater protection under the Convention on International Trade in

Endangered Species of Wild Fauna and Flora (CITES) treaty by uplisting all species to Appendix I, strengthened domestic legislation in some countries, improved international law enforcement efforts, educational initiatives to raise awareness and support for their conservation, and campaigns to reduce consumption in the key markets of China and Vietnam. Eliminating the main markets for meat and scales and subsequently profits from the illegal trade will remove incentive to poach pangolins. Eradicating the biggest threat to their survival will give Asian and African pangolins the best chance to recover. Experts anticipate that populations can rebound and stabilize if poaching is contained. But for this to happen, the world needs to take notice of this unique creature and make a concerted effort to save it.

▲ One of 96 live pangolins confiscated in Medan, Indonesia awaits release in April 2015. Paul Hilton/WCS

A mother and baby get released in Indonesia.
Paul Hilton/WCS



WHAT IS A PANGOLIN?

Pangolins are small-medium sized mammals often referred to as “scaly anteaters” for their defining physical trait: overlapping scales composed of keratin (the same protein that makes up human fingernails as well as rhino horn). They are the only mammals in the world to be covered in scales. Though similar in appearance and diet to armadillos and anteaters, pangolins are more closely related to animals of the order Carnivora, which includes cats, bears and raccoons.

Insectivores, feeding primarily on ants and termites, pangolins may eat up to 70 million insects each year,⁸ thereby acting as natural pest controllers, saving countries millions of dollars in pest destruction.⁹ In addition to keeping potential crop-damaging insect populations in check and thus lessening the need for harmful pesticide use, pangolins further benefit crops and humans by helping to aerate soil as they dig for prey.

Their anatomy is well adapted to their specialized diet: Though pangolins have no teeth, they have long claws for digging up ant nests and termite mounds, ears that seal up to prevent ants from crawling in, and sticky tongues as long as one-third of their body length for scooping up prey. Pangolins have poor eyesight and rely instead on their excellent sense of smell. Some species (e.g., Temminck’s Ground

Pangolin) often walk on their hind legs, using their long tails to balance. And while many are ground dwelling, burrowing deep into the earth, others are arboreal, sleeping in trees and able to hang from branches with their strong tails.

Gestation periods vary by species, but all fall within an estimated 105 to 165 days. Pangolins typically give birth to one young at a time, though they may occasionally give birth to twins. After a pangolin is born, it is carried on its mother’s back for the first three months while its scales gradually harden.

A pangolin’s scales offer it protection from predators: When threatened, they curl into a ball and their hard scales act as armor. Though this armor can fend off lions, it provides no defense against humans. Pangolins can also emit a foul secretion from their anal glands when threatened (similar to a skunk).

Detailed knowledge of the pangolin’s life history is lacking, since their nocturnal, solitary habits are rarely observed.¹⁰ Researchers lack extensive quantitative data about their population levels, lifespans and diets. In all, there are eight pangolin species—four Asian and four African—distributed across 51 countries (19 Asian range states and 32 African range states). These eight species occupy their own tax-



▲ A Sunda Pangolin clings to a tree in Indonesia. Paul Hilton/WildAid

They eat up to 70 million insects each year, acting as natural pest controllers, saving countries millions of dollars a year in pest destruction.

onomic Order, Pholidota, having descended from carnivores over 70 million years ago. All eight species are listed in Appendix II of CITES: a list of species not yet facing extinction but requiring trade in their products to be closely regulated to avert the threat of extinction. Under this protection countries must conduct non-detriment findings before authorizing trade,

however, as their populations are so poorly known this proves a seemingly impossible task. Since 2000, the Asian species have been subject to a CITES zero export quota for wild-caught individuals traded for primarily commercial purposes, which effectively bans all international, commercial trade in Asian pangolins.

SPECIES

1 SUNDA/MALAYAN PANGOLIN | CRITICALLY ENDANGERED

Manis javanica is native to Southeast Asia and found in Lao PDR, Thailand, Vietnam, Cambodia, Malaysia, Myanmar, Singapore, Brunei Darussalam, Indonesia (Sumatra, Java, and Borneo).¹¹ The species is arboreal, using its claws to climb and access ant nests in trees, often sleeping in tree hollows.¹² The species has suffered an estimated 80% decline over the last 21 years primarily due to hunting for its meat and scales.¹³ In Vietnam, hunters reported that the species has drastically declined since 1990 when the commercial trade began to escalate.¹⁴ In 1999, villagers in Lao PDR estimated that some populations had been reduced to just 1% of their 1960s level.¹⁵ An estimated 200,000 have been traded in the last decade,¹⁶ and it is predicted the Sunda pangolin will face further declines of up to 80% over the next 21 years.¹⁷

2 CHINESE PANGOLIN | CRITICALLY ENDANGERED

Manis pentadactyla is native to Bhutan, China, Hong Kong, India, Lao People's Democratic Republic, Myanmar, Nepal, Taiwan, Thailand, and Vietnam.¹⁸ The species burrows underground where it eats and sleeps,¹⁹ making it especially susceptible to hunters using dogs. The species has suffered a suspected 90% decline over the last 21 years due to hunting for meat and scales.²⁰ Becoming "commercially extinct" in China around 1995,²¹ the number of pangolins dropped to just 50,000-100,000 individuals by 2002 according to scientists' estimates. In 2004, the same scientists noted that populations within and near China had declined 88-94% since the 1960s.²² It is predicted the Chinese pangolin will face further declines of up to 90% over the next 21 years.²³

3 PHILIPPINE PANGOLIN | ENDANGERED

In 1998, *Manis culionensis* was recognized as a distinct species from the Sunda Pangolin (the distinction was supported with a morphological study in 2005).²⁴ The species is endemic to six islands in the Philippines and lives in lowland forests and grasslands. The species has suffered suspected declines of more than 50% over the last 21 years due to habitat destruction and hunting.²⁵ These pangolins are hunted for their meat and scales at the local, national and international level,^{26,27,28} and are perhaps equally threatened by loss of habitat,²⁹ largely as a result of logging or conversion to palm oil plantations.³⁰

4 INDIAN/THICK-TAILED PANGOLIN | ENDANGERED

Manis crassicaudata is native to South Asia; its range includes Pakistan, India, Nepal, Bangladesh, and Sri Lanka. The species spends more time on the ground than in trees, burrowing under rocks, but they are adept climbers. The species is expected to suffer a 50% decline in the population over the next 21 years, primarily as a result of growing international trade in meat and scales and a species focus shift as a result of the imminent collapse of the Chinese and Sunda populations.³¹

5 TREE/WHITE-BELLIED PANGOLIN | VULNERABLE

Phataginus tricuspis is found in Angola, Benin, Cameroon, Central African Republic, Congo, The Democratic Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Nigeria, Rwanda, Sierra Leone, South Sudan, Tanzania, Togo, Uganda, and Zambia.³² White-bellied pangolins prefer moist habitats, living in tropical lowland forests and dense woodlands.³³ The population is declining and an expected 40% decline will be evident in the next 14 years due to hunting for bushmeat and use in local traditional medicine as well as exploitation for overseas markets.³⁴ It is the most common African forest pangolin and the most regularly found in African bushmeat markets.³⁵

6 GIANT PANGOLIN | VULNERABLE

Smutsia gigantea is native to Cameroon, Central African Republic; Congo, The Democratic Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Senegal, Sierra Leone, Tanzania, and Uganda.³⁶ As its name suggests, the Giant Pangolin is the largest of all the pangolin species and can reach lengths of up to six feet.³⁷ The species is terrestrial, living in both tropical forest and savannah habitats. The population is declining and an expected 40% decline will be evident in the next 18 years primarily due to local bushmeat hunting and an increase in international demand.³⁸

7 CAPE/TEMMINCK'S GROUND PANGOLIN | VULNERABLE

Smutsia temminckii is the most widespread African pangolin species, found in Botswana, Central African Republic, Chad, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe.³⁹ The pangolin spends much of its time on the ground, burrowing into the earth in dry savannah and desert environments.⁴⁰ The population is predicted to continue to experience a 30-40% decline over the next 18 years because of the local trade in bushmeat and traditional medicine, and its growing inclusion in international trade.⁴¹

8 LONG-TAILED/BLACK-BELLIED PANGOLIN | VULNERABLE

Phataginus tetradactyla, the smallest of the pangolin species, is found in Cameroon, Congo, The Democratic Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Liberia, Nigeria, and Sierra Leone. The species is hunted for meat and medicinal use, but to a lesser degree than the Giant or White-bellied pangolin species.⁴² It is the least frequently recorded and most arboreal of the African pangolins. Black-bellied pangolins are being reported with increasing frequency in bushmeat markets in Nigeria.⁴³ The population is projected to undergo a 30-40% decline evident in the next 14 years.



5 WHITE-BELLIED PANGOLIN



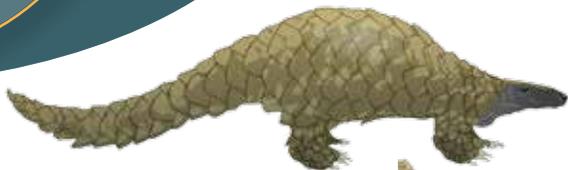
6 GIANT PANGOLIN



4 INDIAN PANGOLIN



1 SUNDA PANGOLIN



7 TEMMINCK'S GROUND PANGOLIN



3 PHILIPPINE PANGOLIN



8 BLACK-BELLIED PANGOLIN



2 CHINESE PANGOLIN



VULNERABILITY

SLOW REPRODUCTION Pangolins have a low reproductive rate, typically producing one offspring per year, or every other year. This makes them susceptible to overexploitation and slow recovery, especially when combined with habitat loss. Researchers have limited knowledge about their lifespans in the wild, but have estimated the generation span for each species to be between 7 and 9 years.⁴⁴

EASY PREY Pangolins defend themselves from lions, hyenas, and other predators by curling into a ball, leaving only their hard scales exposed. While this is generally an effective defense against natural predators, it does nothing to protect them from hunters who track them using dogs. The fact that they curl into a tight ball rather than attempt to escape makes it that much easier for poachers to pick up the pangolin and place it in their sacks.

DIFFICULT TO KEEP IN CAPTIVITY Over 100 zoos and organizations have tried to sustain pangolins over the past 150 years with little success.⁴⁵ Most of the animals died within the first 6 months to 3 years of captivity,⁴⁶ with recorded mortality rates of 70% in the first year.⁴⁷ Pangolins' specialized diets combined with an extreme sensitivity to capture-induced stress and weak immune systems⁴⁸ have resulted in very low survival rates.

To date, only 10 pangolins are documented to have been bred in captivity.⁴⁹ Attempts in China in the 1980s were unsuccessful: 85% of the animals died of pneumonia and were unable to adapt to a man-made diet or captive environment.⁵⁰ Fifty-five percent of pangolins reported in captivity in Asia between 1995 and 2015 died within 4.5 years.⁵¹ The undisputed challenges to captive management of pangolins and slow breeding rates indicate that the animals have not yet been "farmed,"⁵² and all illegally-traded pangolins are thus taken from the wild.⁵³ Outlets claiming breeding success are likely citing captive born pangolins (in which case a wild female was already pregnant prior to captivity), rather than truly captive bred.



THREATS

POACHING FOR THE ILLEGAL INTERNATIONAL TRADE Far and away the biggest threat pangolins face is poaching for their meat and scales, products largely destined for consumer markets in China and Vietnam. Prior to the introduction of international regulations, pangolins were widely traded for their skins and scales. Tens of tonnes of scales were traded between Indonesia and East Asia between 1925 and 1960, while China hunted up to 160,000 animals annually throughout the 1960s and 1980s.⁵⁴ In the 1980s-1990s, "tens of thousands of pangolin skins, as well as leather products such as wallets, belts, and handbags, were traded internationally each year, reportedly derived from Sunda Pangolins"—most of the skins went to Japan, the United States and Mexico.⁵⁵ In 2004, Wu et al. identified illegal hunting for trade, "largely to supply demand in China for meat and scales, used for tonics and traditional medicines," as the greatest threat to the conservation of pangolins.⁵⁶ Poaching has become professionalized and commercialized due to the lucrative trade in meat and scales, with fewer instances of opportunistic individuals simply stumbling across pangolins in the forest, although this does still occur. Poachers in some regions even rely on specially trained dogs to sniff out pangolins in their burrows or trees.⁵⁷

LOCAL HUNTING Asian pangolins are hunted and consumed locally as a protein source, but as their value increases, this subsistence use is being replaced by international commercial trade.⁵⁸ African pangolin species are hunted for the domestic bushmeat trade and for local use of their scales in Juju, Muti and other traditional African bush medicines.⁵⁹

HABITAT DEGRADATION Habitat loss and fragmentation is occurring throughout the species' ranges as a result of deforestation caused by expanding agriculture, logging and conversion of land to rubber and palm oil plantations, and is the second biggest threat to Asian pangolins' survival.⁶⁰ Deforestation and agricultural land conversion in Africa has exacerbated declines caused by hunting: These areas show the most pronounced reduction in pangolin densities and distribution.⁶¹ Human and agricultural expansion have damaged burrows and hollows, while habitat loss and conversion has placed pangolins in closer proximity to people making these mammals increasingly vulnerable to poaching. While African species have shown some ability to adapt to new, modified habitats, and are sometimes found in abandoned palm plantations,⁶² they are believed to avoid areas of dense agricultural development or human settlement (more research is needed on their ability to survive in these habitats).

PESTICIDES The use of insecticides can disrupt pangolin habitats and reduce their food supply. Findings from the Taiwan Forestry Research Institute found Taiwan's Chinese Pangolin population to be "under pressure from habitat destruction, especially by insecticide spraying."⁶³

ELECTRIC FENCES Increasing use of electric, "game-proof" fences pose a threat to ground-dwelling pangolins in Africa, especially the Temminck's Ground Pangolin in South Africa.⁶⁴ The country uses over 100,000 km of fencing—mainly electrified—to contain wildlife in conservation areas and private game ranches, including Kruger National Park (which has one of the densest distributions of pangolins), and to control the movement of wildlife on private land. When its scales catch on a fence, the pangolin goes into its defensive mode and curls into a ball, wrapping its body around the wire, subjecting it to prolonged electric shocks.



▲ A poacher holds a captured Sunda Pangolin up to the camera, Indonesia. Paul Hilton.

USES

TRADITIONAL CHINESE MEDICINE

The belief that pangolin scales offer any kind of medical benefit to a user is not founded in scientific analysis. Pangolin scales are composed of keratin, the same protein present in human hair and fingernails. No scientific evidence exists to support any of the purported curative properties.

However, the China Association of Traditional Medicine lists pangolins among necessary raw ingredients for treatment of “coronary heart disease, myocardial infarction, angina, stroke, coma, cerebral vascular disease, fever-induced delirium and shock, infectious diseases, cancer.”⁶⁵ Although pangolins have been used in Traditional Chinese Medicine (TCM) for thousands of years, new wealth in China has led to an increase in demand for their products. Records compiled by herbalist Li Shizhen from the 16th century, suggest scales could effectively eliminate turgescence (swelling), “invigorate” blood circulation and stimulate lactation.⁶⁶

Today, China permits the legal use of the mammal’s scales in clinical treatment and the manufacturing of patented medicines

or medicinal liquor in designated hospitals, and they are listed as an official drug in the Chinese Pharmacopoeia.^{67,68} At least 209 pharmaceutical companies have acquired licenses to produce 66 types of medicines containing scale derivatives, and 716 hospitals in China prescribe them. Scales are only allowed in “clinical treatment of designated hospitals and for the manufacturing of patent Chinese medicines, and are not authorized to be sold by retail to the public out of designated hospitals.”⁶⁹ Yet, such products are still somehow widely available in retail outlets and traditional medicine shops throughout China.

Often dried, cooked and ground into a powder, scales are commonly inhaled, mixed with other medicines, or made into a topical paste believed to cure skin diseases and cancer, detoxify the body, relieve palsy⁷⁰ and treat asthma⁷¹ among other ailments. The Journal of Chinese Medicine promotes the many uses of “Chuan Shan Jia” [pangolin scales]: “to disperse blood stasis (for promoting menstruation and lactation), reducing swelling and promoting discharge of pus (for abscesses and boils etc.) and for expelling wind-dampness (for pain due to rheumatism/arthritis).”⁷²



Pangolin wine on display in a Hanoi restaurant. Mark Leong. ▶

An excerpt from a 1938 edition of *Nature* suggests that pangolin scales were “roasted, ashed, cooked in oil, butter, vinegar, boy’s urine, or roasted with earth or oyster-shells, to cure a variety of ills” in China including “excessive nervousness and hysterical crying in children, women possessed by devils and ogres, malarial fever and deafness.”⁷³ The article estimates that 4,000-5,000 pangolins were imported from Java annually at that time.⁷⁴

Scale usage is also promoted online. Until recently, the international website *Massage Today* described recommended dosages of scales—between 3-10 grams taken as a decoction or 1-1.5 grams “when ground into powder for oral administration.”⁷⁵ The site claimed that scales can be combined with herbs “to treat a host of conditions, including masses in the abdomen, amenorrhea, rheumatism, arthralgia, postpartum galactostasis, skin and external diseases, and scrofula (tuberculosis of lymph nodes, especially in the neck).”⁷⁶ [Note: after WildAid appealed to *Massage Today* in May 2015, the company removed all mentions of pangolin scales from their website.]

There are, however, serious medical side

Over-the-counter medicine containing pangolin and tortoise sourced from Guangxi, China for sale in a Traditional Chinese Medicine shop in Indonesia. The pills are touted as an “excellent medicine for acute and chronic skin diseases, including toxic swelling, eczema, scabies, sores, etc.” Paul Hilton/WildAid



effects to using scales and these are recognized by TCM practitioners: “side effects include bloating, loss of appetite, abnormal liver function, jaundice, liver damage, and some allergy symptoms” such as a rash or swollen face.⁷⁷ According to TCM, “Chuan Shan Jia is poisonous and should not be used in overdose. [...] this should be forbidden in cases of deficiency of both Qi and blood, bursted boils, and pregnant women.”⁷⁸

TRADITIONAL AFRICAN MEDICINE

Up to 80% of Africa’s population relies on traditional medicine for primary health care.⁷⁹ All four African pangolin species are threatened in western, central and southern parts of the continent due to hunting for this local use of their scales, bones, meat and other body parts.⁸⁰ In Muti, a form of African bush medicine, pangolin scales are believed to “protect against bad omens, ward off lions, bring good luck and treat heart conditions.”⁸¹

In Ghana, where the black-bellied, white-bellied and giant species reside, traditional healers use 13 pangolin body parts to treat 35 ailments, including spiritual protection (scales, largely), rheumatism (both scales and bones), infertility (head) and convulsions (scales).⁸² Meanwhile, pangolin meat is used to prepare “charms” for tribal leaders and chiefs.⁸³

In Nigeria, body parts from native

black-bellied and white-bellied pangolins are widely used for medicinal and ritualistic purposes. The Awori people use pangolin parts to treat 47 conditions, including rheumatism (bones, scales), stroke (vertebral bones, scales), kleptomania (eyes, tails), convulsions and menstrual pain (thorax), stomach ulcers, venereal diseases, back pain, mental illness and diseases that require antibiotics (scales).⁸⁴ The whole animal is necessary in “preparation of fortune rousers, immune boosters and rituals performed during the foundation laying stage of new buildings.”⁸⁵ Scales and other parts are also used for protection, as good luck charms, and to ward off witches and evil.⁸⁶ There is some overlap in use among the Ijebu people, who utilize pangolins in the treatment of 42 conditions. Traditional Yorubic medicine uses scales to treat stomach ulcers, venereal diseases, stroke, mental illness, to ward off witchcraft, and as an ingredient in antibiotics, while eyes and bones are similarly used for kleptomania, rheumatism and stroke.⁸⁷

MEAT, A “DELICACY”

Experts at the 2008 Workshop on Trade and Conservation of Pangolins in Singapore noted that “pangolin meat is favored as a local source of protein in some southern parts of China, especially Guangdong Province and Guangxi Zhuang Autonomous Region, where it is believed to have the effects of nourishing the kidney and removing heat and toxic elements.”⁸⁸

Previously a supplemental protein source for rural villagers,⁸⁹ pangolin meat is now considered a delicacy, consumed by the wealthy in China and Vietnam. Interviews in Vietnam in 2013 revealed that the meat was available at all 18 high-end, luxury restaurants visited, and was the most expensive meat at 89% of those.⁹⁰ Its high price, rarity and wild-sourced status are appealing to state officials and business elites who order pangolin to flaunt their social position or impress their clients.^{91,92} A 2014 *New York Times* article quoted a Guangzhou businessman claiming to eat pangolin once or twice a year for business purposes: “Pangolin hotpot is considered a novelty treat, a gesture of hospitality.”⁹³

To ensure its freshness, restaurants in Vietnam and China offer to slit the pangolin’s throat at the table in front of the guest. The blood, believed by some to be an aphrodisiac,⁹⁴ is drained and drunk, while the meat can be stir-fried, grilled or steamed.⁹⁵

Pangolin fetuses are believed to increase virility and are consumed in soups in Asia.⁹⁶ Carcasses are sometimes submerged in rice wine to concoct a “health tonic” that is believed to have many healing properties.^{97,98}

Consuming pangolin meat was banned in China during the SARS epidemic since it was feared the animals could be vectors for disease if consumed. In 2014, China revised its Criminal Law, reinforcing this consumption ban. Trade in scales remains legal.



TRADE

According to CITES trade data, 576,303 Asian pangolins were legally traded between 1977 and 2012. “This mainly involved skins (90%; 521,490/576,303), most of which were traded for commercial purposes (93%; 486,987/521,490), and virtually all of which (99%; 514,284/521,490) occurred prior to, or in, the year 2000.”¹⁰⁴ Yet evidence shows significant trade occurred and was not reported to CITES during this period, thus underestimating the volume of pangolin products heading to international markets. Unreported trade includes tens of thousands of pangolins imported to China in the 1990s, ~50 tonnes of scales imported to Taiwan in the 1980s, and ~95 tonnes of scales imported to China in the 1990s.¹⁰⁵ Since 2000, little legal trade has been reported to CITES (only African species can be traded for primarily commercial purposes).¹⁰⁶ While there is some legal trade in Asian species for “personal” and “medicinal” purposes, significant illegal international trade has taken place since the introduction of the zero export quotas in 2000.

Substantial legal, commercial and international trade in African pangolin species occurs in conjunction with domestic

harvest and trade. Recently, some CITES Management Authorities have reported an increase in export requests for African pangolin scales and live specimens.¹⁰⁷ In January 2015, Ugandan officials authorized a pangolin scale dealer to export 7 tonnes of scales bound for China with an estimated market value of USD \$4.2 million.^{108,109}

Seizure data from Asian countries shows that at least 264,736 animals were illegally traded between 2000 and 2015.¹¹⁰ Assuming reported seizures represent 25% of the actual numbers in trade, the IUCN estimated that more than one million animals have been illegally traded since 2000, making pangolins the most commonly trafficked mammal in the world.¹¹¹

For many years China has consumed pangolins, both for their meat and their scales. This ongoing use coupled with growing demand has dramatically impacted regional Chinese pangolin populations to the point that sourcing other species from countries near and far is now required to meet demand. Evidence indicates that China imported scales from Java as early as 1925, but “the growing human population and economy in South China have pushed

the demand for pangolin derivatives to an unprecedented high level today.”¹¹² The Chinese pangolin population—formerly found throughout south China and in Fujian, Guangdong, Yunnan Guizhou, Hainan, Hunan, Taiwan and Guangxi Zhuang—is estimated to have fallen by more than 94% in China and its border regions since the 1960s.¹¹³ The species is rarely seen “in at least half of the habitats in provinces of Guangdong and Fujian as well as Guangxi Zhuang Autonomous Region where they formerly existed densely.”¹¹⁴ Those nations “closest to China have seen dramatic declines in the wild populations of pangolins.”¹¹⁵ In 2008, a group of pangolin experts, including scientific researchers and CITES Management Authorities, concluded that “continual demand and the decreasing Chinese wild [pangolin] population” has led to “great declines” in populations across Cambodia, Vietnam, and Lao PDR, indicating that pangolins from Indonesia and Malaysia supply the bulk of East Asian markets.¹¹⁶ Despite the zero export quotas, evidence shows that at least 49,600 [Sunda] individuals were smuggled out of Indonesia between 2000 and 2008.¹¹⁷ In 2009, TRAFFIC reported: “According to

CHINA'S PANGOLIN SCALE STOCKPILE

Despite various attempts to uncover details about its size and source, little is known about China's stockpile of pangolin scales, which supplies the factories and hospitals that manufacture patented medicines containing them. Since 2008, the Department of Wildlife Conservation under the State Forestry Administration (SFA) has allocated ~25 tonnes of pangolin scales among 18 provinces and cities each year (the annual utilization quota). The legally approved factories and hospitals must report the amounts they need for the upcoming year to authorities in their provinces, who in turn report these figures to SFA. At the 65th CITES Standing Committee Meeting in July 2014, China noted, “only historical pangolin stockpiles can

be used for medicinal purposes.”⁹⁹ A 2012 SFA notification to provincial forestry departments instructed that “the quota must be used during the one-year period. If the quota cannot satisfy needs, relevant enterprises can choose to purchase pangolin scales from legally registered breeders.”¹⁰⁰ But questions of source arise given the lack of import records for pangolin scales and the [thus far] unsuccessful attempts at breeding pangolins on a commercial scale. According to the CITES trade database, China has imported just 14.89 tonnes of scales since 1980. Following a “dire shortage of locally available scales” in the early 1990s, supplies were sourced from neighboring countries, until those too collapsed in 1995,

leading to significant price increases.¹⁰¹ The Chinese Materia Medica Company Information Centre reported “severe” shortages of scales in 1996 and 1998, at which point companies advertised offers to purchase “substantial” quantities elsewhere.¹⁰² The shortage reported in 1998, coupled with the negligible imports recorded since 2000, suggests China's supply of scales is running low. Yet, over 186 tonnes of scales were reported as distributed between 2008 and 2015, representing approximately 400,000 pangolins (assuming a 467g conversion rate¹⁰³). The question is: where are the scales coming from and are they legally sourced? If so, when will the supply run out?

pangolin hunters and traders, there are so few pangolins left in forests throughout Cambodia, Vietnam and Lao PDR, they are now sourcing animals from their last remaining strongholds in Southeast Asia and beyond."¹¹⁸ In Pakistan, tripling prices have encouraged more poaching, resulting in rapidly declining Indian pangolin populations.¹¹⁹ During January-June 2014, 17 pangolin trafficking incidents were reported across China, India, Indonesia, Nepal, Pakistan, and Thailand.¹²⁰

Now, as Asian pangolin populations plummet, the animals are increasingly sourced from Africa. Prior to 2008 few records if any existed of intercontinental trade of African pangolins to Asia,¹²¹ but recent seizures of scales and frozen animals in transit from Africa to Vietnam and China demonstrate evidence for the shifting supply. In June 2016, Hong Kong Customs officials seized 4 tonnes of scales originating in Cameroon, and one month later seized 7.3 tonnes of scales arriving from Nigeria. As the distance grows between source and market, it becomes harder to ship the animals live. Seizures made in Medan¹²² and Surabaya,¹²³ totaling over 5.7 tonnes and destined for China and Singapore, demonstrate a shift toward slaughtered, frozen pangolins, which are often declared as "frozen fish."¹²⁴ There are reports of Chinese buyers placing orders for pangolins in Gabon, and a trader in Uganda claimed he "always exported the pangolin scales to China."¹²⁵

The number of pangolins hunted across Sub-Saharan Africa and the Congo Basin has increased significantly as a proportion of mammals/vertebrates hunted over the past 43 years, with a proportional 9-fold increase observed from pre-2005¹²⁶ to post-2005. In Ghana, Guinea, Rwanda and Nigeria, white-bellied pangolin populations are decreasing, with 92% of traditional medicine practitioners in one region (Ogun State, Nigeria) noting declines in the size and number of pangolins caught.¹²⁷ Prevalence of black-bellied and giant ground pangolins is on the rise in Nigerian bushmeat markets as white-bellied populations become harder to source.^{128,129} Of the pangolin seizures made in the EU in 2012 and 2013, the majority were of African origin, with 85% involving illegally exported animals from west and central Africa.¹³⁰

Eighty percent of the seized products were destined for China.¹³¹ In the past five years, Southern Africa experienced a "57-fold increase in the number of recorded cases involving the illegal possession of, or trade in, pangolins."¹³²

It is important to note, however, that demand is not confined to Asia. The United States confiscated over 26,000 imported pangolin products between 2004 and 2013. Although on a smaller scale, evidence also suggests demand for pangolin meat in Europe, as part of the broader demand for bushmeat in urban markets, such as Paris, to which an estimated 4.5 tonnes of bushmeat is shipped each week.^{133,134}

CHINA

Until the 1990s, China was "self-sufficient" in pangolins for medicinal use, with records from the Guangdong Provincial Mederia Medica Company showing that over 20,000 captured each year in that province alone in the 1960s.¹³⁵ Extrapolating to nationwide levels, the annual number of animals killed was estimated to have been at least 150,000-160,000 pangolins.¹³⁶ Other estimates for the same time period are even higher, with roughly 170,000-180,000 pangolins believed to have been captured annually throughout China.¹³⁷ Over the next three decades, it is believed that China's pangolin population declined by at least 80%.¹³⁸ By 2002, just 50,000-100,000 remained—far below that year's annual consumption requirement of 200,000.¹³⁹ In 2008, China's pangolin population was estimated to be between 25,100-49,550 individuals.¹⁴⁰

Yearly consumption of pangolin meat in China in 2002 represented 100,000 animals.

Since the 1990s, China has become dependent on scale imports from other range states, particularly Vietnam, Myanmar and Lao PDR.¹⁴¹ By this time illegal international trade also began to rise: Chinese and Sunda pangolins were increasingly

shipped from Southeast Asian countries to Guangxi and Yunnan, and from there sent to Guangdong, Hainan, Fujian, major Chinese herb stores and restaurants.¹⁴²

In 2002, an estimated ~10,400-13,000 pangolins were consumed as food in Nanning City alone, the capital of Guangxi Zhuang Autonomous Region.¹⁴³ Meanwhile, an estimated 26,000-32,500 were consumed the same year in the whole of Guangdong province,¹⁴⁴ despite the fact that only ~14,270 pangolins remained in Guangdong at this time.¹⁴⁵ More broadly, researchers estimated that the yearly consumption of pangolin meat in all of China in 2002 represented 100,000 animals.¹⁴⁶ At this time, an estimated 36 tonnes of pangolin scales—equal to roughly 64,000 pangolins—if available, could be sold via the Guangxi Yuling Chinese Herb shop in China.¹⁴⁷ It was believed that Yuling Chinese Herbs supplied 60% of other shops, while stocks from Guangxi and Yunnan supplied the remaining 40%.¹⁴⁸

Hunting or catching pangolins for primarily commercial purposes is banned in China, except under "exceptional circumstances" including scientific research, if authorized by the forestry authorities at the provincial level.¹⁴⁹

PRICE

In the 20-year period leading up to 2012, the retail price of pangolin scales rose 30-fold in China.¹⁵⁰

In Kunming, China, growing demand has caused price hikes: Live pangolins that sold for \$80 per kg in 2008, now fetch over \$200 per kg, while scales previously selling for \$300 per kg, have reached \$600 per kg.¹⁵¹ Scales entering Yunnan valued at \$300 are "subsequently sold for \$700 by criminal cartels controlling trade."¹⁵² Pangolin meat can sell for \$350 per kg in China,¹⁵³ and a single pangolin can fetch up to \$3,000.¹⁵⁴

In Vietnam, scales sell for between 5.5 to 5.6 million VND per kg, or about \$250/kg.¹⁵⁵ A June 2015 WildAid investigation found that local Vietnamese restaurants pay traders more than 5 million VND per kg for pangolin meat, which is then marked up and sold on to consumers at "market price."



▲ A government official holds up one of the estimated 3,000-4,000 frozen pangolins confiscated by the National Police's Criminal Investigation Division and WCS's Wildlife Crimes Unit in Medan, Indonesia. Paul Hilton/WCS

PANGOLIN FARMING?

The China Association of TCM has proposed farming as a solution to the “bottleneck” that the scarcity of endangered species has created for TCM medicine production, noting, “pangolin breeding has shown signs of [promise].”¹⁵⁶ Education for Nature Vietnam (ENV) notes that pangolin farming is not economically viable given the animal’s susceptibility to stress, their specialized diet and low reproductive rate, suggesting: “Businessmen who invest in the ‘farming of pangolins’ are either poor businessmen destined to lose their investment, or more likely are criminals masquerading their farms as legitimate enterprises, but in truth, laundering pangolins through their farms.”¹⁵⁷ Even if it was possible to effectively replicate pangolin diets and minimize captive stress, given low reproductive rates, the

scale of the current trade would outstrip the ability to farm.

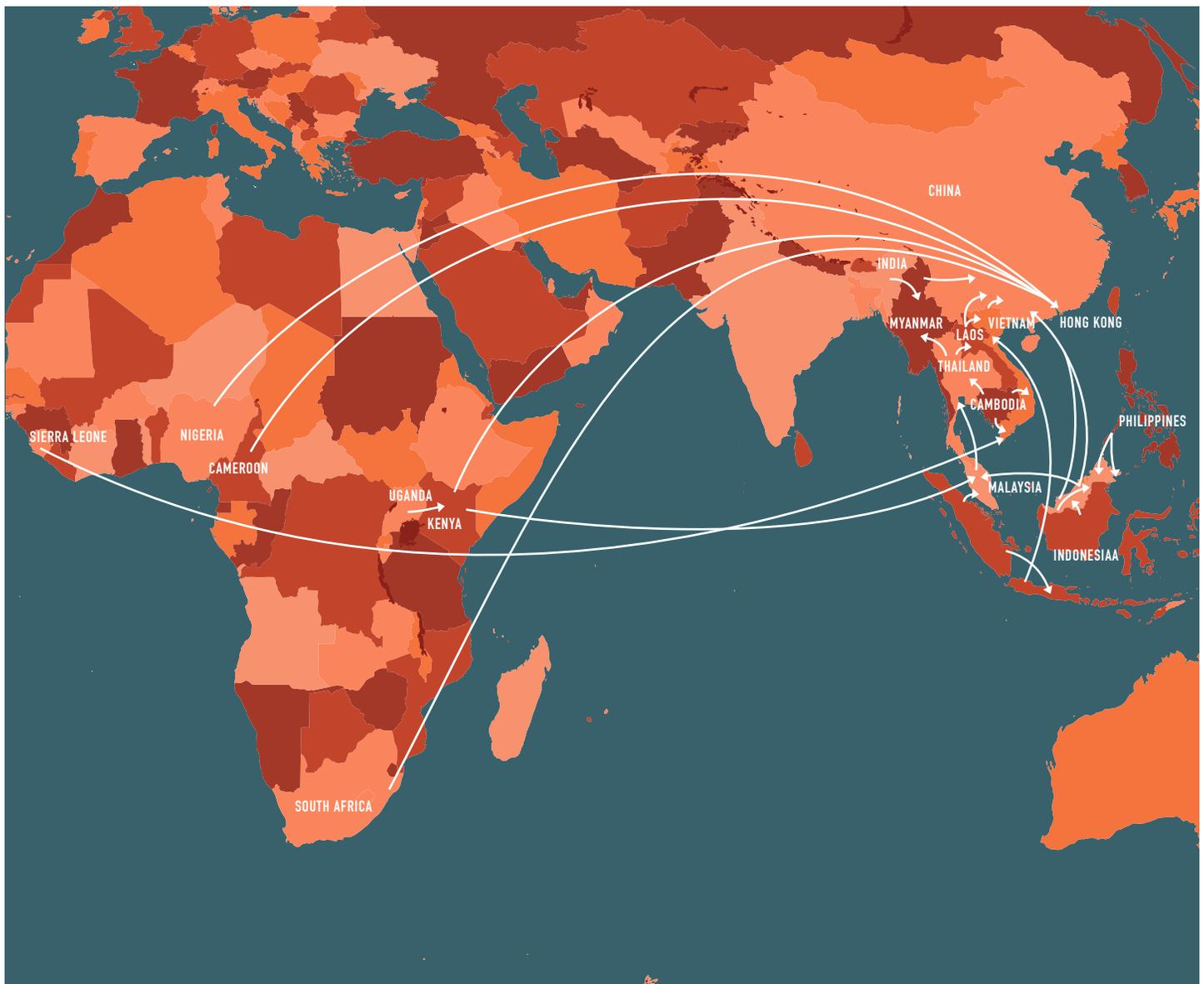
At the 2008 Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia it was noted that “all pangolins in trade are from the wild. Rumors of commercial scale breeding are false. Pangolins are known to be extremely hard to keep in captivity, and even harder to breed.”¹⁵⁸

In 2010, the South China Institute of Endangered Animals and Guangdong Provincial Wildlife Rescue Center attempted to keep and breed 35 seized Chinese (2) and Sunda (33) pangolins.¹⁵⁹ Thirty of the animals died of “gastrointestinal disease and other unknown diseases” within the first year and the remaining five died within the second year.¹⁶⁰

TRADE ROUTES

The pangolin trade is carried out along four main routes:¹⁶¹

- 1 High volume trade from Indonesia to China and Vietnam by shipping containers, mainly of frozen (de-scaled) animals.
- 2 Trade over land from Indonesia, across the Malacca straits to Peninsular Malaysia and north through Thailand and Lao PDR to Vietnam, and eventually to China. Products often include live animals or scales, some of which stay in Vietnam for domestic consumption.
- 3 Trade from South Asia, originating in Nepal and India, to China via Myanmar, largely consisting of pangolin scales.
- 4 Trade from Africa to Asia, frequently via Hong Kong, often by shipping container and generally containing scales or frozen animals.



A confiscated pangolin peers out of its holding box following a bust in Medan, Indonesia. Paul Hilton/WCS



In some instances, this trade is linked to the tiger trade.

Trade via shipping containers, car, post, train and even speedboat has been documented recently.

In the past, locals would opportunistically harvest pangolins and pass them on to middlemen visiting the villages, who would then sell them to the dealers that ship pangolins or derivative products to end markets in China or Vietnam.¹⁶² Pangolins purchased in Southeast Asia are brought to China by sea, using ports in Guangdong, Fujian, Yantai and Shandong. These cases involve thousands of dead pangolins.¹⁶³ A 2007 TRAFFIC survey of five Chinese cities—Kunming, Nanning, Fuzhou, Guangzhou, and Haikou—found that 18% of restaurants served pangolin meat and 81.5% of TCM shops sold raw or processed scales.¹⁶⁴ These findings, coupled with seizure data from that time, indicated “three main smuggling routes for meat—by road from Myanmar

and Lao PDR to Yunnan via Guangdong, from Vietnam to Guangxi, or to Guangdong by sea—and one for scales—Myanmar to Yunnan then to the TCM wholesale markets of Hebei Anguo and Anhui Bozhou”¹⁶⁵ and from there to Juhuyuan and Qingping.

Elsewhere in Asia, Sunda pangolins are frequently caught in Cambodia and smuggled into Vietnam via locals who are hired by traders to carry the animals across the border.¹⁶⁶ Pangolins are also commonly smuggled from Lao PDR to Vietnam via border crossings such as Cau Treo in Ha Tinh Province.¹⁶⁷ Thailand also acts as a transit country for pangolins destined for markets in China or Vietnam, and in some instances this trade is linked to the tiger trade.¹⁶⁸



SEIZURES

Annual seizures amount to over 10,000 animals, but likely represent a small fraction of those in trade: Data from one trafficking syndicate from 2007-2009 showed 22,000 pangolins had been killed in a 21-month period in Sabah, Malaysia.¹⁶⁹

Between July 2010 and June 2015, Hong Kong reported 89 pangolin seizure cases, totaling 7.2 tonnes of carcasses and 12.4 tonnes of scales, equating to roughly ~9,400 individuals in the five-year period.¹⁷⁰



Pangolin scales. Paul Hilton/WildAid

PANGOLIN SCALES

Conversions assume 467g dry weight of scales per individual¹⁸⁵

IN TONNES



WHOLE PANGOLINS

455 frozen ¹⁸⁶	Indonesia	Jul. 2015
3,000–4,000 frozen / 96 live ¹⁸⁷	Indonesia	Apr. 2015
956 pangolins ¹⁸⁸	China	May 2014
>800 pangolins ¹⁸⁹	Vietnam	Aug. 2013
10 tonnes frozen pangolins ¹⁹⁰	Philippines	Apr. 2013
2,090 frozen pangolins ^{191, 192}	China	Jul. 2010
2,460 pangolins ¹⁹³	Vietnam	Feb. 2008

HEALTH RISKS

Confiscated pangolins often show skin infections and gastrointestinal parasites: An estimated 70% of confiscated pangolins in Cuc Phuong National Park in Vietnam show skin infections under their scales. Parasitic worms are common, as is coccidiosis, a highly contagious and sometimes fatal parasitic disease of the intestinal tract.¹⁹⁴ Skin lacerations, limb injuries, eye, oral, and gastric ulcers as well as symptoms of dehydration and malnourishment are common in confiscated and captive pangolins.

MARKET INVESTIGATIONS

To better understand the market demand that drives pangolin poaching, WildAid investigators interviewed chefs and restaurant owners in Vietnam about the consumption of meat and scales in early 2015. We found further evidence that consumption of pangolin products exists even within the ranks of government officials (confirming that reported above).

A restaurant menu advertising eight ways to order pangolin meat, including deep fried, steamed or stewed with its blood, Hai Phong, Vietnam. Paul Hilton/WildAid.



HANOI

INVESTIGATOR: How do they prepare the pangolin?

RESTAURANT MANAGER: The pangolin is the highlight of our restaurant. Just this noon a group of customer from Company No36 [a company of the Ministry of Defense] had pangolin here. With pangolin we can serve blood soup, fried gut, steam the whole pangolin and serve on the table, pangolin soup with green bean or with herbal medicine. [...] We don't have frozen stuff here. We only serve live fresh animal, which you can cut for blood right in the table. We are not selling frozen stuff.

INVESTIGATOR: How about the scale after eating the pangolin?

RESTAURANT MANAGER: You can bring it home raw or we deep fried it and serve as another dishes right here. ...Of course here we sell the real scale from the pangolin. We have some customers from the Ministry of Security eating pangolin here several times a month. If you want to buy pangolin scales, 1 million VN (50 USD) per 100gr, just let me know I will ask the staff to bring it over here.

HAI PHONG

INVESTIGATOR: What would I do with the pangolin scale?

RESTAURANT OWNER: People roasted it with sand in the hot pan, the scale become crunchy like cracker and they put it in rice wine. The wine is good for men, to treat the impotent problem. Beside, pangolin is one of the ingredient in other dishes in our restaurant.

INVESTIGATOR: If I want to invite my friend to your restaurant for a special meal with pangolin, can I come to eat here?

RESTAURANT OWNER: You can come to both of our places, but you need to call to book. Here or at 48 (Cat Bi Street). You can order both pangolin scales and pangolin meat dishes her. [...] Our restaurant is special. All the high ranking officers from the city have been to our restaurant.

INVESTIGATOR: How about the scales? What can you do with them?

CHEF: We don't use the scales. Normally people sell them to China. Not everyone

can sell it, only the traders know the way to sell it to China.

INVESTIGATOR: Can you cook any dishes with the scales?

CONFIRM INTERVIEWEE: We can only deep fry it. It will be crunchy like a piece of deep fried pig fat. [The scales are] like horn, no nutritional value. People say that the only valuable scale of the pangolin is the upside-down scale. But the hunter usually take it before selling to restaurants.

INVESTIGATOR: So, which dishes will you make from the pangolin?

RESTAURANT OWNER: In Chinese way, we steam the whole pangolin with herbal medicine. In Vietnamese way, we steam the meat separately and serve with salt and chili. The bone we cook in soup with herbal medicine, we also make blood pudding from it.

SURVEYS

CHINA

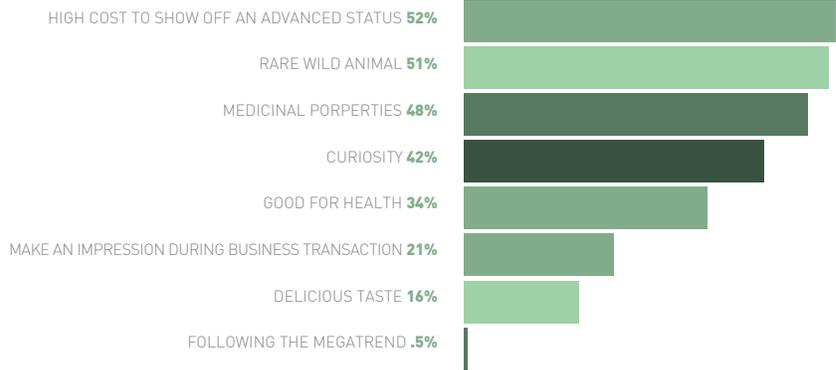
In October 2015, WildAid surveyed residents from Beijing, Shanghai, Guangzhou, Hangzhou, Nanning and Kunming to measure public awareness of pangolins and the poaching crisis and gauge attitudes towards conservation. Ten percent of respondents had purchased pangolin products in the past, while 18% had considered doing so. Of consumers, the majority (66%) had purchased prescription medicines containing scales or consumed pangolin liquor, with a smaller percentage consuming scales and meat.

Alarming, 70% of respondents believe pangolin products have medicinal value, the majority believing scales can cure rheumatism, skin disorders and wound infections. Meat is consumed largely because it is an “expensive status symbol” and an “exotic wild animal,” despite the fact that 74% of respondents believe consuming pangolin meat is illegal.

Sixty-three percent of respondents believe pangolin products come from farmed pangolins, while 50% believe they also come from poached animals. The majority of respondents—82%—believe pangolins are endangered and at 96%, nearly all participants believe pangolins should exist on earth.

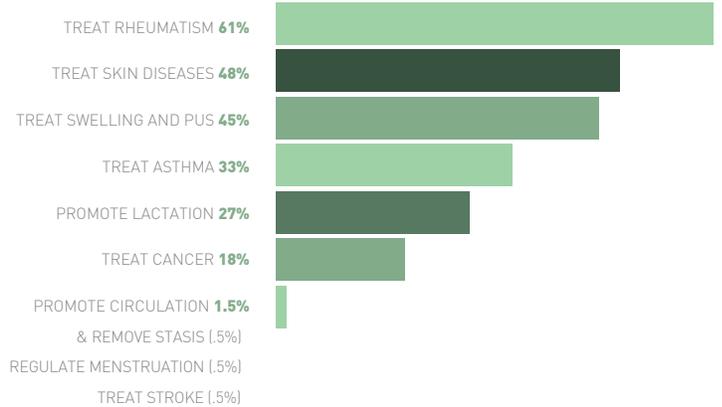
CONSUMPTION RATIONALE

8% OF INTERVIEWEES THAT HAVE CONSUMED PANGOLIN PRODUCTS HAVE EATEN PANGOLIN MEAT



MEDICINAL BELIEFS

70% OF RESIDENTS BELIEVE PANGOLIN SCALES HAVE MEDICINAL VALUE



Research Design: sample size: 3,000 (500 per city); methodology: online; age: 18-55; household income: above 6,000RMB (Beijing, Shanghai, Guangzhou, Hangzhou) and above 3,000RMB (Kunming, Nanning)

PRODUCTS PURCHASED



VIETNAM

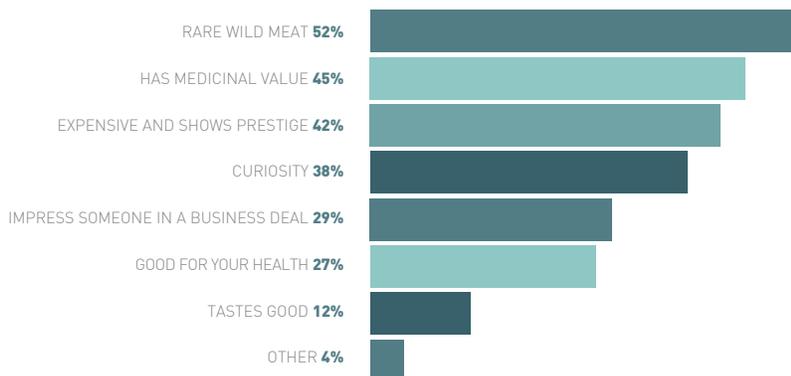
In December 2015, WildAid surveyed residents in Hanoi, Ho Chi Minh City and Da Nang to measure public awareness of pangolins and the poaching crisis and gauge attitudes towards conservation. Just 4% of respondents had purchased pangolin products, while 10% had consumed meat, the majority more than 5 years ago. Of the consumers, many had purchased pangolin wine, meat and scales, with fewer people purchasing medicines, blood and fetus. When asked why pangolin products are consumed, the most common answers were that it's a rare, wild meat, it has medicinal value and it's expensive and therefore shows prestige. Only 7% of respondents said they are considering purchasing pangolin products in the future.

In contrast to China, just 8% of Vietnam's residents currently believe pangolins have medicinal properties, but a further 64% identified as undecided—they have heard of such properties "but do not know if [they are] true." Of the believed remedies, cure for increased libido tops the list, followed by rheumatism, asthma and detoxifying properties.

The majority of respondents (75%) are aware that shops and restaurants are sourcing scales and meat from poached wild pangolins, but 33% believe these products also come from farmed animals. Almost all respondents agree that selling (93%) and purchasing (90%) pangolin products is illegal. Ninety-four percent believe pangolin poaching is common, with trafficking on the rise (93%). The same majority agrees that these animals are endangered, and 98% think "pangolins should exist on earth."

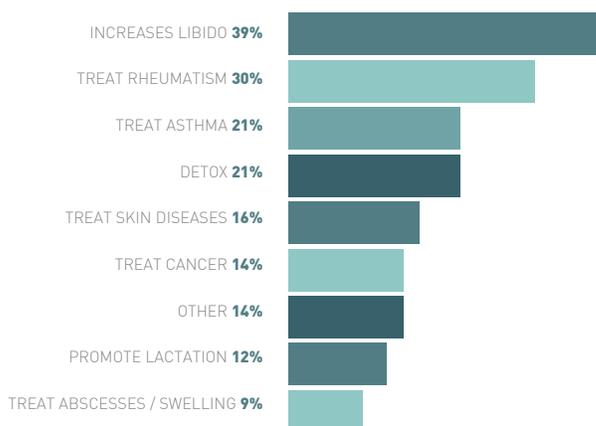
CONSUMPTION RATIONALE

WHY DO YOU THINK PEOPLE CONSUME PRODUCTS OR MEAT FROM PANGOLINS?



MEDICINAL BELIEFS

8% OF RESIDENTS BELIEVE PANGOLIN SCALES HAVE MEDICINAL VALUE, WHILE ANOTHER 64% HAVE HEARD ABOUT THE "CURATIVE" PROPERTIES



Research Design: sample size: 815; methodology: CAWI (515, age 18-40) and CAPI (300, age 40+); criteria: people who are aware of pangolins; household income: above 8,500,000 VND

PRODUCTS PURCHASED



PANGOLIN WINE



PANGOLIN MEAT



PANGOLIN SCALES



PRESCRIPTION MEDICINE CONTAINING SCALE DERIVATIVES



BLOOD



PANGOLIN FETUS



LEGAL PROTECTIONS

All eight pangolin species are included in Appendix II of CITES. A proposal to uplist the four Asian species from Appendix II to Appendix I was presented at the 11th Conference of the Parties in 2000, but was unsuccessful. Instead, Parties agreed to a zero export quota for Asian species “removed from the wild

and traded for primarily commercial purposes,” thus banning all commercial international trade in the Sunda, Chinese, Philippine and Indian pangolins.

Pangolins are listed as protected species in all range states but Brunei Darussalam in Asia.¹⁹⁵ The level of protection varies

widely by country and species (see Appendix). The majority of the 32 African and 19 Asian range states have national legislation in place to prohibit the capture and trade of domestic pangolin populations. Despite international protection through CITES and varying degrees of national protection, the illegal trade persists.

Poachers sometimes use dogs to sniff out pangolins in their burrows and tree hollows. Paul Hilton.

INEFFECTIVE ENFORCEMENT

Despite national and international legislation in place to protect pangolins, poachers and traders rarely get more than a slap on the wrist. “Pangolin traders continue to operate with very little fear of serious penalties,”¹⁹⁶ as enforcement is ‘generally weak due to a lack of wildlife management personnel and funding.’¹⁹⁷ There are of course exceptions, and those responsible can receive harsh punishments: In China in early 2008, two gang leaders responsible for smuggling 17 containers of pangolin and scales worth \$3.2 million into China were given suspended death sentences (which usually turn into life sentences), while three others received life imprisonment.¹⁹⁸ Perhaps promisingly, recent spikes in seizures in places like Hong Kong and Vietnam seem to suggest genuine attempts are now being made to enforce existing legislation.

Range countries have voiced concerns over a lack of awareness across all levels—national, regional and community—of pangolins’ current risk of extinction and each individual species’ protection status, a lack of cooperation among agencies responsible for enforcing such protections, and a lack of manpower or



financial resources to effectively combat the illegal trade.¹⁹⁹ They have highlighted the need for education programs for law enforcement agencies that teach the importance of pangolin conservation and clarify the laws governing national and international trade in pangolins.²⁰⁰ They also require information about methods for identifying the species in trade and innovations in detection techniques at ports and airports.²⁰¹ Species identification is a major challenge, especially in cases where only scales or derivatives are seized. Yet, because levels of protection and legislation vary by species, it is critical that officials are able to identify the animal or else it is exceedingly difficult to gauge the appropriate punishment.

In Vietnam, restaurants selling pangolins are rarely shut down, even if authorities are aware of the trade. Even live pangolins confiscated during seizures are not always safe: although “rescued” from the traders

and poachers who held them, some countries (Vietnam) allow for the animals to be immediately sold back into the trade, even to the same traffickers from whom they were seized.²⁰² Though the species is protected in Vietnam as an Endangered, Precious, and Rare Species, a loophole allowed for pangolins seized from the illegal trade to be legally auctioned off back into the trade until 2013^{203,204} (in November 2013 Vietnam banned all hunting, trade and consumption of the four Asian pangolin species).²⁰⁵ A February 2015 seizure in Bac Ninh province led to outrage among conservationists when police rescued 42 Critically Endangered Sunda pangolins from poachers and handed them over to forest rangers, who then sold the animals to restaurants for more than \$11,000.²⁰⁶ Though the rangers broke the law, they were not charged; only the money was confiscated.

OUTLOOK & RECOMMENDATIONS

The IUCN Species Survival Commission Pangolin Specialist Group re-formed in 2012. The group's 'Scaling Up Pangolin Conservation' action plan launched in 2014 outlines critical actions that require immediate implementation to stop the illegal trade. Broadly, the plan focuses on protecting pangolin strongholds, strengthening legislation, and understanding and reducing consumer demand. Actions include:

- Improving knowledge on pangolin behavior and ecology (define habitat suitability and understand population dynamics);
- Developing rehabilitation and reintroduction protocols;
- Identifying strongholds and implementing patrol-based monitoring of these areas, while conducting outreach with local communities to encourage support for pangolin conservation;
- Encouraging greater transparency surrounding stockpiles and disposal of seized pangolin products;
- Providing training for enforcement officials to increase awareness and capacity for enforcement; developing and implementing demand reduction campaigns for pangolin meat and scales;
- Engaging key opinion leaders and launching awareness campaigns to raise the profile of pangolins globally.²⁰⁷

The roles of organizations such as the Tikki Hywood Trust in Zimbabwe and Save Vietnam's Wildlife in Vietnam are crucial, as these facilities have expert staff that are equipped to rescue live pangolins seized from the illegal trade, rehabilitate and release the animals back into the wild. Without such concentrated expert care, the

chances of survival for captured pangolins are slim. Post-release monitoring is also necessary to ensure that they survive and are integrated into local populations.

Pangolin range states have begun stepping up national legislation and enforcement efforts. In 2012, Zimbabwe amended its Parks & Wildlife Act to include a minimum nine-year jail sentence and/or a fine equal to four times the economic value of the poached animal [approximately USD \$5,000]. In 2015 alone, 84 people were arrested for crimes linked to illegal trading in live pangolins and their products.²⁰⁸

In June 2015, the First Pangolin Range States meeting took place in Da Nang, Vietnam, where delegates from 31 Asian and African range countries convened for a three-day workshop aimed at promoting international collaboration between range states and consuming nations. Participants shared information about the status and vulnerabilities of pangolin populations, discussed the ongoing trade and developed recommended actions for protecting the animals from overexploitation.

Various organizations, including WildAid, have begun conducting research to better understand consumer attitudes and behavior, and have launched ambitious campaigns to raise awareness of the plight of the pangolin and address and reduce demand for their products. As history has shown, unless demand—the root cause of wildlife trafficking—is addressed, threats from the illegal trade will continue. If demand in China and Vietnam remains unchecked, pangolin populations in Asia and Africa may face extinction. Eliminating the main end markets for meat and scales, and subsequently profits from the illegal trade, will remove incentive to poach, giving pangolins the best chance of survival.

RECOMMENDATIONS TO GIVE PANGOLINS THE BEST CHANCE OF RECOVERY

In addition to implementing the actions outlined in the IUCN SSC Pangolin Specialist Group's Scaling Up Pangolin Conservation Action Plan, WildAid recommends the following:

- Increase the level of protection for pangolins by uplisting all eight species to CITES Appendix I. An uplisting will make enforcement easier and conservation a global priority.
- Reduce the demand for pangolin products in China and Vietnam through educational communication campaigns. If demand remains unchecked, pangolins may face extinction.
- Provide training to enforcement personnel to aid in arrests and convictions, and strengthen penalties to deter the illegal trade.
- Encourage China to remove pangolins from the Pharmacopoeia of the People's Republic of China and end the use of scales in patented medicines and clinical trials.
- Encourage Chinese and Vietnamese TCM journals and websites to stop advocating use of pangolin scales in medical treatment. Ban the consumption of all pangolin meat in China and Vietnam.
- End the use of pangolin scales and other derivatives in China, Vietnam and the United States, aiming for a global ban.
- Ban or enforce the existing ban on the consumption of all pangolin meat in China and Vietnam.
- Preserve pangolin habitat by working to limit deforestation and land conversion in high-density regions.

APPENDIX A: RANGE STATE LEGISLATION

Note: Based on information available at the time of writing

AFRICA

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
AFRICA	African Convention on the Conservation of Nature and Natural Resources (Revised Version), 2003	<i>Manidae</i>	Totally protected but may be hunted, captured, killed or collected under permit from the relevant authorities. Penalties for contraventions to be determined by individual range states.
ANGOLA	Ruling on the protection of land, flora and fauna - Decree no 40.040 of 1955	<i>Manidae</i> (<i>M.tetradactyla</i> and <i>M. gigantea</i> , uncertain)	Hunting prohibited without a permit.
BENIN	Wildlife Conservation and Hunting Act, Act no. 87-014 of 1984 and Hunting and Tourism Act, Act no. 93-011 of 1993	<i>Manidae M. tricuspis</i> (<i>M.tetradactyla</i> , uncertain)	Fullyprotectsspeciesfromhuntingunlessforscientific research.
BOTSWANA	Wildlife Conservation and National Parks Act of 1992	<i>S. temminckii</i>	A BWP 10,000 [USD 1,160] fine and imprisonment for seven years.
CAMEROON	Order No. 1262/A/MINEF/DFAP/CEP/SAN bearing additive Order No. 565 A / MINEF / DFAP / SDF / SRC listing the animals of classes A, B, and C and specifying regulations trade and movement of goods Wildlife and Forestry, Wildlife and Fisheries Regulations, Law 94-1 of 1994	<i>S.gigantea</i> <i>M. tricuspis</i> <i>M. tetradactyla</i>	It is unclear what level of protection pangolins have in Cameroon, but they are at least Protected due to their listing on CITES Appendix II (Cameroon Class B).
CENTRAL AFRICAN REPUBLIC	Protection of Wildlife and Hunting Ordinance, Ordinance 84-045 of 1984 and Ordinance no. 84-062 establishing the conditions for the capture and exportation of live wild animals and Commercial Hunting Regulations, Act no. 61/281 of 1961	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P.tetradactyla</i>	Fully Protected Species. Hunting, capture and trade prohibited unless the person is in possession of a commercial capture permit. Game Species. May be hunted for subsistence purposes by indigenes or foreigners subject to a valid hunting license being obtained.
CHAD	Hunting and Wildlife Conservation Regulations, Ordinance no. 14-63 of 1963 and Forestry, Wildlife and Fisheries Resources Act, Act no. 08/PR/14 of 1998	<i>S.temminckii</i>	Fully Protected. Hunting, capture, transport and exportation are strictly prohibited, unless conducted under a special scientific permit and for bona fide research. Species may also be captured and exported under a special 'commercial capture' permit. The legislation covers all four pangolin species, although only <i>S. temminckii</i> is known to occur in this country.
CONGO	Decree No. 6075 of 9 April 2011 Laying Down Animal Species that are Fully and Partially Protected and Act No. 37-2008 on Wildlife and Protected Areas	<i>S.gigantea</i> <i>P. tricuspis</i>	Fully Protected Species.

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
COTE D'IVOIRE	Act no. 65-225 of 1965: Wildlife Protection and Hunting Act and Act No. 94-442 of 1994 Amending Act No. 65-225: Wildlife Protection and Hunting Act	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Fully Protected Species. Collection only allowed for scientific research. Partially Protected. Hunting and capture only allowed under permit. However, since 1974, by the order of 003/SEPN/CAB of 20, hunting is officially closed and prohibited in Côte d'Ivoire until present time. This closure protects all species in general of the Ivory Coast and pangolins whatever Annex.
DEMOCRATICREPUBLIC OF THE CONGO	Ministerial decree No. 003/CAB/MIN/ECN-EF/2006 of 13 June 2006 laying down the rates of duty, taxes and fees to be charged in respect of fauna and flora, on the initiative of the Ministry of Environment, Conservation, Water and Forests and Order No. 014/CAB/MIN/ENV/2004 of 29 April 2004 on implementation of Law No. 82-002 of 28 May 1982 concerning measures hunting regulations	<i>S. gigantea</i> <i>P. tricuspis</i> <i>S. temminckii</i> <i>P. tetradactyla</i>	Fully Protected Species. Partially protected species.
EQUATORIAL GUINEA	Wildlife, Hunting and Protected Areas Act, Act no. 8/1.988 of 1988	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Fully Protected Species. It is illegal to hunt, capture, kill, transport or in any way disturb any of these species.
ETHIOPIA	Proclamation no. 414/2004: The Criminal Code of the Federal Democratic Republic of Ethiopia and Council of Ministers Regulations No. 163/2008: Wildlife Development, Conservation and Utilization	<i>S. temminckii</i>	Protected species. Killing is only allowed for scientific purposes.
GABON	Protection of Wildlife Act, Act189/PR/MEFCR of 1987 and Hunting Regulations no.190/PR/MEFCR of 1987 and Regulations Regarding Hunting and The Bearing of Arms for Hunting, Law no. 46/60 of 1960	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Fully Protected. Capture, killing, trade, transport and trafficking are strictly prohibited, except under a special research permit. Listed as ordinary game species. They may be hunted, killed, captured, traded, trafficked and exported without the need for a permit [Hunting Regulation no. 190/PR/MEFCR of 1987 states that a permit is required for the export of these species if they were obtained during a hunt.]
GHANA	Act 43: Wild Animals Preservation Act, 1961 and Wildlife Conservation Regulations, 1971; Schedule I	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Completely protected. No individuals may be hunted, killed or traded (except for bona fide research, museums and zoological gardens). The young and females with young are specially protected. Legislation does allow for a limited number of pangolins to be killed per annum.
GUINEA	Protection of Wildlife and Hunting Regulations Act, Ordinance no. 007/PRG/SGG/90 of 1990 and Law no. U97/038/An Adopting and Enacting the Protection of Wildlife and Hunting Regulations Act	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Fully Protected Species. Hunting and capture strictly prohibited. Permits are only issued for scientific purposes.

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
GUINEA-BISSAU	Hunting Regulations, Act 21/80 of 1980	<i>Ph. tricuspis</i> <i>S. gigantea</i>	The legislation refers to <i>Manis longicaudata</i> – Tree Pangolin [= <i>Phataginus tetradactyla</i>]. As this species is not known to occur in Guinea-Bissau this legislation may in fact refer to <i>P. tricuspis</i> , or the legislation may not distinguish between the two species. Both species are fully protected species, as are the females and young of both species.
KENYA	The Wildlife Conservation and Management Act, Act no. 47 of 2013	<i>S. temminckii</i>	Unprotected species. Subsistence hunting without a permit is punishable with a fine of not less than KES 30,000 [USD 345], or imprisonment for not less than six months, or to both such fine and prison sentence.
LIBERIA	Regulation on Revised Administrative Fees for Wildlife Conservation (FDA Regulation No. 25)	<i>S. gigantea</i>	Fully protected.
MALAWI	National Parks and Wildlife Act, Act 11 of 1992 And National Parks and Wildlife (Protected Species) (Declaration) Order, 1994	<i>S. temminckii</i>	Protected species.
MOZAMBIQUE	MZ Law, Act. Nr. 10/99 - Forest and Wildlife Act	<i>S. temminckii</i>	If it is deemed a rare species, or one threatened with extinction, the fine may be up to MZN 200,000 [USD 6,700]. This law does not apply to subsistence consumption. (It is unclear whether <i>S. temminckii</i> is considered a rare species and/or a species threatened with extinction in Mozambique. If it is not, then this law would not apply and it would not be protected in Mozambique).
NAMIBIA	Nature Conservation Ordinance 4 of 1975 and Controlle Wildlife Products and Trade Act of 2008	<i>S. temminckii</i>	No trade permitted. Classified as a protected species under the Nature Conservation Ordinance of 1975 and its regulations, where hunting and possession of protected game species is prohibited except under a permit granted by Cabinet. Furthermore, the Controlled Wildlife Products and Trade Act of 2008 and its regulations also addresses possession, trade (domestic or international), and acquisition of any controlled wildlife products.
NIGERIA	Endangered Species (Control of International Trade and Traffic) Act, 1985 Appendix I under the Endangered Species Act Cap E9, Law of Federation of Nigeria [LFN] 2004	<i>S. gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	No capture, local or international trade is allowed.
RWANDA	Ministerial Order No. 007/2008 of 15/08/2008: Establishing the List of Protected Animal and Plant Species and Ministerial Order No. 04/2005 of 08/04/2004: Organic Law Determining the Modalities of Protection, Conservation and Promotion of Environment in Rwanda	<i>Manidae</i> [<i>P. tricuspis</i> <i>P. tetradactyla</i> ? <i>S. temminckii</i>]	Protected species.
SENEGAL	Hunting and Wildlife Regulations, Law no. 86-04 of 1986 and Hunting and Protection of Wildlife Act, Act no. 86-844 of 1986	<i>Manidae</i>	Fully protected species. Hunting, capture and killing is strictly prohibited, unless under a scientific permit. In areas where the population is deemed to be sufficiently large, the Minister of Water, Forests and Wildlife is authorized to make a limited number of individuals of a protected species available for offtake (hunting).

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
SIERRA LEONE	The Wild Life Conservation Act, Act no. 27 of 1972	<i>S.temminckii</i> <i>S. gigantea</i> All <i>Manidae</i> young	Protected species.
SOMALIA	Law on Fauna (Hunting) and Forest Conservation And Law no. 15 of 1969	<i>S.temminckii</i>	Prohibited [Fully Protected] Game Species. No person may hunt, kill, possess or trade a Prohibited Game Species.
SOUTH AFRICA	National Environmental Management: Biodiversity Act, Act 10 of 2004 (with 2013 revisions), Threatened or Protected Species Regulations, 2007	<i>S. temminckii</i>	Protected species.
SUDAN	The Preservation of Wild Animals Ordinance and Ordinance no. 5 of 1935	<i>S.temminckii</i>	Specially Protected Species. Hunting, trade and possession of such species and their derivatives are only allowed under a special ministerial license.
SWAZILAND	Game (Amendment) Act, Act 4 of 1991 and Game Act of 1953	<i>S.temminckii</i>	Royal Game. Possession of a Royal Game species without the relevant permits is punishable with a prison term of 5–15 years, without the option of a fine.
TANZANIA	Wildlife Act, 2013 and Wildlife Conservation (National Game) Order of 1974	<i>Manidae</i> [<i>P. tricuspis</i> <i>S. gigantea</i> <i>S. temminckii</i>]	National Game. No person may hunt, kill, capture, wound or molest any National Game, unless prior written permission has been obtained from the Director of Wildlife.
TOGO	Wildlife Protection & Hunting Ordinance of 1968 and Decree no. 80-171 of 4 June 1980 on the application procedures of ordinance no. 4 of 16 January 1968 regulating the protection of wildlife and the exercise of hunting in Togo	<i>S.gigantea</i> <i>P. tricuspis</i> <i>P. tetradactyla</i>	Partially protected.
UGANDA	Uganda Wildlife Statute, Statute Number 14 of 1996 and Game (Preservation and Control) Act, 1959 [Schedules]	<i>Manidae</i> (All species) [<i>P. tricuspis</i> <i>P. tetradactyla</i> <i>S.gigantea</i> <i>S.temminckii</i>]	May only be captured or hunted under special permit.
ZAMBIA	Zambia Wildlife Act, Act 12 of 1998 and The National Parks and Wildlife (Protected Animals) Order, Statutory Instrument no. 80 of 1993.	<i>S. temminckii</i> <i>P. tricuspis</i>	Pangolins are a protected species. Hunting is prohibited without a valid permit. Domestic and international trade is prohibited, except for scientific purposes using a CITES export permit.
ZIMBABWE	Parks and Wild Life Act, 1975 (with 2012 Statutory Instruments)	<i>S. temminckii</i>	Specially Protected species.

Source: Lisa Hywood, Tikki Hywood Trust.

ASIA

BANGLADESH	Wildlife (Conservation & Security) Act 2012, Schedule I	<i>M. pentadactyla</i> <i>M. crassicaudata</i>	All trade and domestic use is prohibited.
BHUTAN	Forest and Nature Conservation Act of 1995 [implemented by Forest and Nature Conservation Rules of Bhutan, 2006].	<i>M. pentadactyla</i>	Broad protection under this act.
BRUNEI DARUSSALAM	Forestry Act (2002) and the Wild Fauna & Flora Order, 2007 [implementing CITES].	<i>M. javanica</i>	Broad protection under this act.

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
CAMBODIA	Ministry of Agriculture, Forestry and Fisheries Declaration 020 and Forestry Law 2002 and Sub-Decree No. 53 (RGC) on international trade in endangered species of wild fauna and flora (2006).	<i>M. javanica</i>	Listed as 'Rare species' in MAFF (Ministry of Agriculture, Forestry and Fisheries) Declaration 020 (Since 25/01/2007) and receives protection under the Forestry Law 2002.
CHINA	Protection of Wildlife Act 1989 and Regulations on the Implementation of Protection of Terrestrial Wild Animals 1992 and Regulations on Management of Import and Export of Endangered Species of Wild Fauna and Flora 2006 [implementing CITES]	<i>M. pentadactyla</i> <i>M. crassicaudata</i> <i>M. javanica</i>	State Category II protected species. China's Supreme People's Court promulgated two judicial interpretations in 2000 defining criteria for imposing penalties for wildlife crime related offences, including pangolin related offences. Water, Forests and Wildlife is authorized to make a limited number of individuals of a protected species available for offtake (hunting).
HONG KONG SAR	Wild Animals Protection Ordinance 1976 [Amended 1980, 1996] and Protection of Endangered Species of Animals and Plants Ordinance 2006	<i>M. pentadactyla</i>	Protected wild animal.
INDIA	Wildlife Protection Act 1972 [amended 2003, 2006]	<i>M. pentadactyla</i> <i>M. crassicaudata</i>	Completely protected species being listed in Schedule I.
INDONESIA	Wildlife Protection Ordinance No.266 and Conservation on Biodiversity and Ecosystems Act No. 5 of 1990 and Government Regulation on Conservation on Flora and Fauna No. 7 of 1999.	<i>M. javanica</i>	Protected since 1931.
LAO PDR	Wildlife & Aquatic Law (2007)	<i>M. pentadactyla</i> <i>M. javanica</i>	Listed in the 'Prohibition' category as a rare, near extinct, high value or species of special importance in the development of socio-economic, environmental, educational and scientific research.
MALAYSIA	Wildlife Conservation Act 2010 and International Trade in Endangered Species Act 2008	<i>M. javanica</i>	Totally protected species.
MYANMAR	Protection of Wildlife and Protected Areas Law 1994	<i>M. pentadactyla</i> <i>M. javanica</i>	Completely protected species.
NEPAL	Protected Animal in Schedule I of the National Parks and Wildlife Protection Act 1973 [as amended 1993]	<i>M. pentadactyla</i>	There is no legal provision for hunting, trade or domestic use.
PAKISTAN	Islamabad Wildlife (Protection, Preservation, Conservation, and Management) Ordinance, 1979; and the North-West Frontier Province Wildlife (Protection, Preservation, Conservation, and Management) Act, 1975.	<i>M. crassicaudata</i>	Protected species.
PHILIPPINES	Philippine Wildlife Act 9147	<i>M. culionensis</i>	Listed as Critically Endangered under this act, which bans the collection of any form of wildlife without a permit.
SINGAPORE	Wild Animals and Birds Act 1965 (amended, 2000) and Wild Animals and Birds (Composition of Offences) Order 2005 and Endangered Species (Import/Export) Act 2006 (amended 2008)	<i>M. javanica</i>	Protected species.
SRI LANKA	Fauna and Flora Protection (Amendment) Act, No.22 of 2009	<i>M. crassicaudata</i>	Listed as Strictly Protected in Schedule II

RANGE STATE	LEGISLATION	SPECIES	LEVEL OF PROTECTION
NEPAL	Protected Animal in Schedule I of the National Parks and Wildlife Protection Act 1973 [as amended 1993]	<i>M. pentadactyla</i>	There is no legal provision for hunting, trade or domestic use.
TAIWAN	Wildlife Conservation Law 1989 (Amended 1994).	All <i>Manis spp</i>	Protected species.
THAILAND	1992 Wild Animals Reservation and Protection Act B.E. 2535	All <i>Manis spp.</i>	Protected wild animals.
VIETNAM	Management of Endangered, Precious and rare Species of Wild Plants and Animals 2006.	<i>M. pentadactyla</i> <i>M. javanica</i>	Since 2014, <i>M. Javanica</i> and <i>Pentadactyla</i> are listed as legally protected as a rare and priority species for conservation under Decree 160 which is the country's highest protection level and which states that live animals seized from the trade must be transferred to a rescue center or released if strong enough (effective January 1, 2014); the Decree does not regulate dead pangolins or derivatives and auctioning of these confiscated items is allowed (Vietnam 2013).

Source: Challender, DWS. Co-Chair, IUCN SSC Pangolin Specialist Group (unpublished report, 2015).

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