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OF WILD FAUNA AND FLORA

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THE STATUS, TRADE AND CONSERVATION OF PANGOLINS (*MANIS* SPP.)

This document has been submitted by the Secretariat on behalf of the IUCN SSC Pangolin Specialist Group*, in relation to agenda items 64 on *Pangolins* (Manis spp.) and 88 on *Proposals to amend Appendices I and II*.

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THE STATUS, TRADE AND CONSERVATION OF PANGOLINS (*MANIS* SPP.)

INFORMATION DOCUMENT FOR THE 17TH MEETING OF THE CONFERENCE OF THE PARTIES TO CITES

24 SEP – 05 OCT 2016, JOHANNESBURG, SOUTH AFRICA

Prepared by the IUCN SSC Pangolin Specialist Group

IUCN SSC PANGOLIN SPECIALIST GROUP

Introduction

1. The aim of this document is to provide information on the status, trade and conservation of pangolins (Manidae) to the CITES Parties to inform their decision-making at the 17th meeting of the Conference of the Parties to CITES. It provides information on: the global conservation status of pangolins (paragraphs 2-3); legal and illegal trade levels and dynamics (paragraphs 4-12); principal national legislation affording protection to pangolins (paragraphs 13-17); use of pangolins (paragraphs 18-21); conservation (paragraphs 23-25); pangolin farming and exploitation for zoological collections (paragraphs 26-27) and IUCN SSC Pangolin Specialist Group support to pangolin Range States (paragraph 28).

Global conservation status

2. All eight species of pangolin are listed as threatened on the IUCN Red List of Threatened Species on the basis of past, on-going and future population declines. These declines are due primarily to high levels of hunting and poaching for domestic use as bushmeat/wild meat and use in traditional medicines, and international trade, which by volume is almost exclusively illegal today. Other threats include habitat loss and degradation caused by shifting cultivation and conversion of forests to permanent agricultural crops and industrial tree plantations, particularly palm oil, and electrocution by electric fences.

3. The current global conservation status of each species of pangolin is detailed below. Note that while CITES includes each species of pangolin in the genus *Manis*, the IUCN Red List follows Gaudin *et al*. (2009) which considers the species to reside in three genera, *Manis*, *Smutsia* and *Phataginus*. In this document we follow the taxonomy adopted by CITES.

   Asia
   Populations of the Chinese pangolin *Manis pentadactyla* and Sunda pangolin *M. javanica* have declined steeply over the past two decades, and these trends are predicted to continue (Challender *et al*., 2014a, b). As populations of these species decline, trade attention is increasingly being transferred to the Indian pangolin *M. crassicaudata* and Philippine pangolin *M. culionensis*. Population declines in all four species are attributed primarily to overexploitation for domestic use and international trade, largely to supply demand in East Asia, as well as local use across their range. Asian pangolins are also threatened by habitat loss and degradation (Challender *et al*., 2014b).

Chinese pangolin *Manis pentadactyla*, Critically Endangered (A2d+3d+4d)
Assessed as Critically Endangered in 2014 on the basis of predicted continuing declines of up to 90% over the next 21 years or three generations. For the full IUCN Red List account for this species including a distribution map, see here.

Distribution: Native to Bhutan, China, Hong Kong SAR, India, Lao PDR, Myanmar, Nepal, Taiwan (PR China), Thailand and Viet Nam.

Population: In China, which comprises the greatest part of its range, the population was estimated at 50,000 to 100,000 animals in 2003, having declined by up to 94% since the 1960s (Wu *et al.* 2004). It is estimated that 160,000 pangolins were harvested annually in China in the 1960s, although this number declined to a few thousand by the 1990s (Zhang 2008). *Manis pentadactyla* is now considered 'commercially extinct' in China. It is very rare in Guangxi and Yunnan Provinces and considered to have declined severely in Hainan (Nash *et al.* 2016). It is considered to be widespread but rare in Hong Kong (Special Administrative Region). In Taiwan (Province of China) the species has reportedly recovered in some places from historical reductions, with estimated densities in some areas of 12 to 13 adult pangolins per km^2 (Pei 2016). There is virtually no information on population status in India; though confiscations suggest the species is under heavy collection pressure. Field sightings in Lao PDR are also now extremely rare. The population in Nepal was estimated at approximately 5,000 individuals in 2011 and is believed to be in decline. In Viet Nam hunters report that the species has declined severely in the past two decades and is now extremely rare.

Very recent evidence suggests the presence of *M. pentadactyla* in Eastern Bangladesh.

Sunda pangolin *Manis javanica*, Critically Endangered (A2d+3d+4d)
Assessed as Critically Endangered in 2014 on the basis of suspected declines of up to 80% over the last 21 years (generation length estimated at seven years), and projected continuing declines of $\geq$80% over the next 21 years. For the full IUCN Red List account and distribution map for this species see here.

Distribution: Native to Brunei Darussalam, Cambodia, China (based on a number of museum records), Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand and Viet Nam. Considered to now be extremely rare in the northern part of its range.

Population: Although quantitative information on the status of populations is scarce, interviews with hunters in Peninsular Malaysia, Cambodia, Lao PDR, Thailand and Viet Nam suggest the species has and is declining severely. Pangolin populations in Lao PDR have reportedly declined by as much as 99% in some areas between the 1960s and late 1990s (Challender *et al.* 2014b). These declines have been ascribed to hunting, chiefly for international trade. In Indonesia there is very little information on status, but seizures in recent years, sometimes involving several thousand animals, indicates that there is intense hunting pressure in the country and which is almost certainly causing population declines. Populations appear to be stable in Singapore based on the frequency of sightings (Lee 2016).

Indian pangolin *Manis crassicaudata*, Endangered (A3d+4d)
Assessed as Endangered in 2014 on the basis of suspected population declines of at least 50% in the next 21 years (generation length estimated at seven years). For the full IUCN Red List account for this species including distribution map, see here.

Distribution: Occurs in South Asia from northeast and southeast Pakistan south throughout the Indian sub-continent, including Sri Lanka, and east to southern Nepal. It was found throughout Bangladesh historically but there are no recent records and the species may be extinct there. There are historical records of this species from southwest China (Yunnan Province) where its presence is uncertain, and dubious records from Myanmar.

Population: There is a lack of quantitative population data for *M. crassicaudata*. However, in the early 1980s it was reported that populations in India, which comprises by far the largest part of the species' range, had been greatly reduced by hunting. It is believed to have been extirpated from

some of its range in Bangladesh, and populations appear to have declined due to poaching in parts of Pakistan. In the Potohar Plateau of northeast Pakistan, it is estimated that the average population density of *M. crassicaudata* underwent a 79% decline between 2010 and 2012 (Mahmood 2016). The species is reportedly of variable abundance in Sri Lanka, but nowhere common.

Philippine pangolin *Manis culionensis*, Endangered (A2d+A3d+4d)
Assessed as Endangered in 2014 due to suspected population declines of ≥50% over a period of 21 years (generation length estimated at seven years). For the full IUCN Red List account for this species including distribution map, see here.

Distribution: Endemic to six islands in the Philippines: mainland Palawan and the much smaller adjacent islands of Coron, Culion, Balabac, Busuanga and Dumaran Island. It has also been introduced to Apulit Island adjacent to Palawan.

Population: There are relatively recent (2012) estimates of densities of 0.05 individuals per km^2 in primary forest and 0.01 per km^2 in mixed forest/brush land. This species is reportedly more abundant in northern and central Palawan than in the south. It is also reportedly abundant on Dumaran Island (435km^2). In 2004 the species was described by local people as fairly common in Palawan, though subject to moderately heavy hunting pressure (Lagrada *et al.* 2014). More recently, local hunters report that increased effort is now needed to catch pangolins, potentially as a consequence of declining populations (Lagrada 2012).

Africa
Although fewer data are available for African pangolins (the Black-bellied pangolin *M. tetradactyla*, White-bellied pangolin *M. tricuspis*, Giant pangolin *M. gigantea* and Temminck's ground pangolin *M. temminckii*), these species have long been hunted and poached for bushmeat and use in traditional African bush medicine, and recent research suggests exploitation for local consumption is increasing in Africa (Ingram *et al*. 2016). Furthermore, a growing illegal intercontinental trade involving African pangolins and their derivatives, primarily their scales, to supply demand in East and South-east Asia is a developing and worrying trend (Challender and Hywood 2012; Gomez *et al*. 2016). Other threats include habitat loss and degradation (Waterman *et al*. 2014) and, for Temminck's ground pangolin specifically, electrocution from electric fences (see Pietersen *et al*. 2014).

White-bellied pangolin *Manis tricuspis*, Vulnerable (A4d)
Assessed as Vulnerable in 2014 on the basis of estimated population declines of at least 40% over a 21 year period (seven years past, 14 years future; generation length estimated at seven years). For the full IUCN Red List account for this species including distribution map, see here

Distribution: Ranges from Guinea, Sierra Leone and much of West Africa to Central Africa as far east as south-western Kenya and north-western Tanzania (west of Lake Tanganyika) and as far south as north-western Zambia and northern Angola; also on Bioko (Kingdon and Hoffmann 2013).

Population: Research in Benin has suggested an average density of 0.84 individuals per km^2 during the dry season in both plantations and natural forest. The species is believed to be declining in Ghana, Guinea and Nigeria, and close to extinction in Rwanda (Bräutigam et al. 1994; Soewu and Ayodele 2009).

Black-bellied pangolin *Manis tetradactyla*, Vulnerable (A4d)
Assessed as Vulnerable in 2014 (taking a precautionary approach). This species is projected to undergo a population decline of at least 30-40% over a 21 year period (seven years past, 14 years future; generation length estimated at seven years). For the full IUCN Red List account and distribution map for this species, see here.

Distribution: Occurs in the forested regions of West and Central Africa from Sierra Leone eastwards through south-eastern Guinea, Liberia, Côte d'Ivoire and southwest Ghana, there being an apparent gap in distribution until west Nigeria. It then occurs eastwards through southern Cameroon, and

much of the Congo Basin forest block to the Semliki valley (and thus, just possibly, into Uganda). It may occur in Angola.

Population: There are no quantitative data available on densities or abundance. This is the least frequently recorded of all African pangolin species, possibly reflecting its occurrence in little-penetrated habitats and/or reflecting its rare nature and low densities.

Giant pangolin *Manis gigantea*, Vulnerable (A4d)
Assessed as Vulnerable in 2014 because it is reasonable to assume that this species has already begun declining and will continue to decline by at least 40% over a 27 year period (nine years past, 18 years future; generation length estimated at 9 years). For the full IUCN Red List account and distribution map for this species, see here.

Distribution: Discontinuously distributed in humid forests in West and Central Africa. It is recorded from Senegal eastwards through Guinea, Sierra Leone, Liberia, Côte d'Ivoire and Ghana. It may occur in southern Nigeria. Its presence in Togo, Benin, Burkina Faso and Niger is uncertain. From Cameroon it is fairly continuously distributed throughout the Congo Basin to Uganda and western Tanzania. It was previously considered extinct in Rwanda but recent evidence suggests it still persists there.

Population: The CITES Management Authority of Uganda reported a national population estimate, based on camera trapping, of just over 2,000 individuals, with densities of up to six individuals per km^2. Based on observed population densities for *M. temminckii*, also a terrestrial species, this seems high. Bräutigam *et al.* (1994) report the species is believed to be quite rare, declining throughout its range.

Temminck's ground pangolin *Manis temminckii*, Vulnerable (A4d)
Assessed as Vulnerable in 2014 (taking a precautionary approach) because there is an inferred past/ongoing and projected future population reduction of 30-40% over a 27 year period (nine years past, 18 years future; generation length estimated at nine years). For the full IUCN Red List account for this species and distribution map, see here.

Distribution: The most widespread African pangolin species, recorded from southeastern Chad, through South Sudan, much of East Africa and southern Africa as far south as South Africa. The northern limits of its distribution are not well defined, although the species has been recorded from extreme northeast Central African Republic, southeastern Chad, South Sudan and southwest Ethiopia.

Population: It is estimated that this species occurs at a density of 0.12/km^2 in Kruger National Park (Swart 2013), and 0.11/km^2 in the Gokwe district of Zimbabwe (Heath and Coulson 1997). However, populations in Zimbabwe are thought to have decreased since this time (Hywood 2013). In the Northern Cape Province of South Africa, densities have been calculated at 0.22/km^2 (Pietersen 2013). Abundance in other regions of Africa is not well known.

Legal and illegal trade levels and dynamics

4. Historically, pangolins have been exploited across Africa and Asia for a range of consumptive uses including for food, traditional medicines and fashion, and for international trade (Herklots 1937; Bräutigam *et al*. 1994). Based on available evidence, international trade in Asian pangolins has historically been far more voluminous than in the African species. A recent review of trade in the Asian species indicates that between 1977 and 2012 international trade involved approximately half a million animals as reported to CITES, and which mainly involved skins, most of which were traded for commercial purposes and virtually all of which occurred prior to, or in, the year 2000. Trade mainly involved the Sunda pangolin *Manis javanica* and Chinese pangolin *Manis pentadactyla,* and the bulk of trade involved exports from Lao PDR, Malaysia, Thailand and Indonesia to the US and Mexico for the manufacturing of leather goods. However, trade in this period was likely higher than

these figures as it also included substantial numbers of leather goods including handbags, belts and wallets but which are difficult to equate unambiguously to a number of animals.

5. Actual levels of international trade in Asian pangolins between 1977 up to the year 2000, however, were substantially higher than trade reported to CITES based on data and information within the CITES Review of Significant Trade process and the scientific literature. As examples, up to 10t of pangolin scales were imported to Taiwan (P.R. China) annually between 1980 and 1985 and up to 13t of scales were imported to South Korea annually throughout the 1980s. China imported a minimum of 95t of scales from Southeast Asia between 1990 and 1995. None of this trade was reported to CITES (Broad *et al*. 1988; Anon 1992; Anon 1999a, b). Based on such evidence, Challender *et al*. (2015) estimated that unreported trade in the period 1977-2000 involved an additional, estimated 88-163% (or 505,423-935,369 pangolins) of trade reported to CITES.

6. At CoP11 (2000) the Parties to CITES established zero export quotas for wild-caught Asian pangolins traded for primarily commercial purposes. Since this time, there has been comparatively little trade in the species reported to CITES (Challender *et al*. 2015). However, seizure data and records of trade (e.g., from court cases) indicate that a substantial illegal trade has taken place since. Based on an updated dataset presented in Challender *et al*. (2015), between July 2000, when the zero export quotas came into force, and the end of July 2016, there were over 1,000 seizures of pangolins and their derivatives globally involving an estimated 277,000 animals (see Challender *et al.* 2015 for methods).

7. In Asia, these occurred in 16 out of the 19 range states for Asian pangolins (Cambodia, China, Hong Kong SAR, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan (P.R. China), Thailand and Vietnam) and involved approximately 247,000 animals. It mainly involved the Sunda pangolin and Chinese pangolin, but included all four Asian species (Challender *et al.* 2015).

8. Since 2008, confiscations of African pangolins derivatives, primarily scales, being trafficked internationally have emerged and are seemingly increasing (Challender & Hywood 2012). This trade has involved, at a minimum, an estimated 19,000 African pangolins involving all four species. Understanding trade dynamics at a species level, especially where African pangolins are involved, is difficult as seizure reports tend not to go beyond the genus level. As such, confiscations involving a further 11,000 pangolins took place in Asia between July 2000 and July 2016, a proportion of which may also have involved African pangolins but it is difficult to determine the source of these shipments, i.e., Asia or Africa. Illegal trade in African pangolins has involved small volumes of pangolin scales but also very large, commercial scale shipments. This is likely a result of declining pangolins populations and availability in Asia but also increasing and strengthening economic ties between African nations and East Asia (Challender *et al.* 2016).

9. Examples of recent, large scale seizures involving African pangolins include the following:

    - A total of 13.4 tonnes of pangolin scales confiscated in Hong Kong in shipping containers arriving from Cameroon (4t), Nigeria (7.3t) and Ghana (2.1t), equating to estimated 7,000 individuals, in June and July 2016.
    - Two tonnes of scales seized in Hong Kong in a shipping container which had arrived from Nigeria in March 2015.
    - Two tonnes of pangolins scales seized at Entebbe airport, Uganda, in January 2015, which were to be exported to Amsterdam.
    - In Cameroon, 1.5 tonnes of African pangolin scales seized at Yaounde airport in June 2014.
    - More than three tonnes of pangolin scales confiscated in Hong Kong in two shipping containers, arriving from Uganda via Kenya and Malaysia and from Cameroon via Malaysia respectively, in June 2014.

10. Based on available evidence and expert insight, the IUCN SSC Pangolin Specialist Group considers trade in pangolins to be of conservation concern in the following countries in Africa: Angola, Benin, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Kenya, Liberia, Nigeria, Sierra Leone, South Africa, Togo and Uganda. It also notes that in June 2012, the EU CITES Scientific Review Group (SRG) banned imports of white-bellied pangolins from Guinea into the EU, based on concerns about the sustainability of trade (SRG 2012).

11. Using a conservative extrapolation rate to account for trade which goes undetected and unreported, and based on an assumption that seizures in the updated dataset presented in Challender *et al*. (2015) represent approximately 25% of actual trade levels (as opposed to the less conservative but frequently used estimate of 10%; see Wasser *et al*. 2007), illicit trade in pangolins in the last 16 years is estimated to involve >1,100,000 animals.

12. Major pangolin trafficking routes along which >1,000 pangolins were trafficked between July 2000 and the end of July 2016 are depicted in Figure 1.

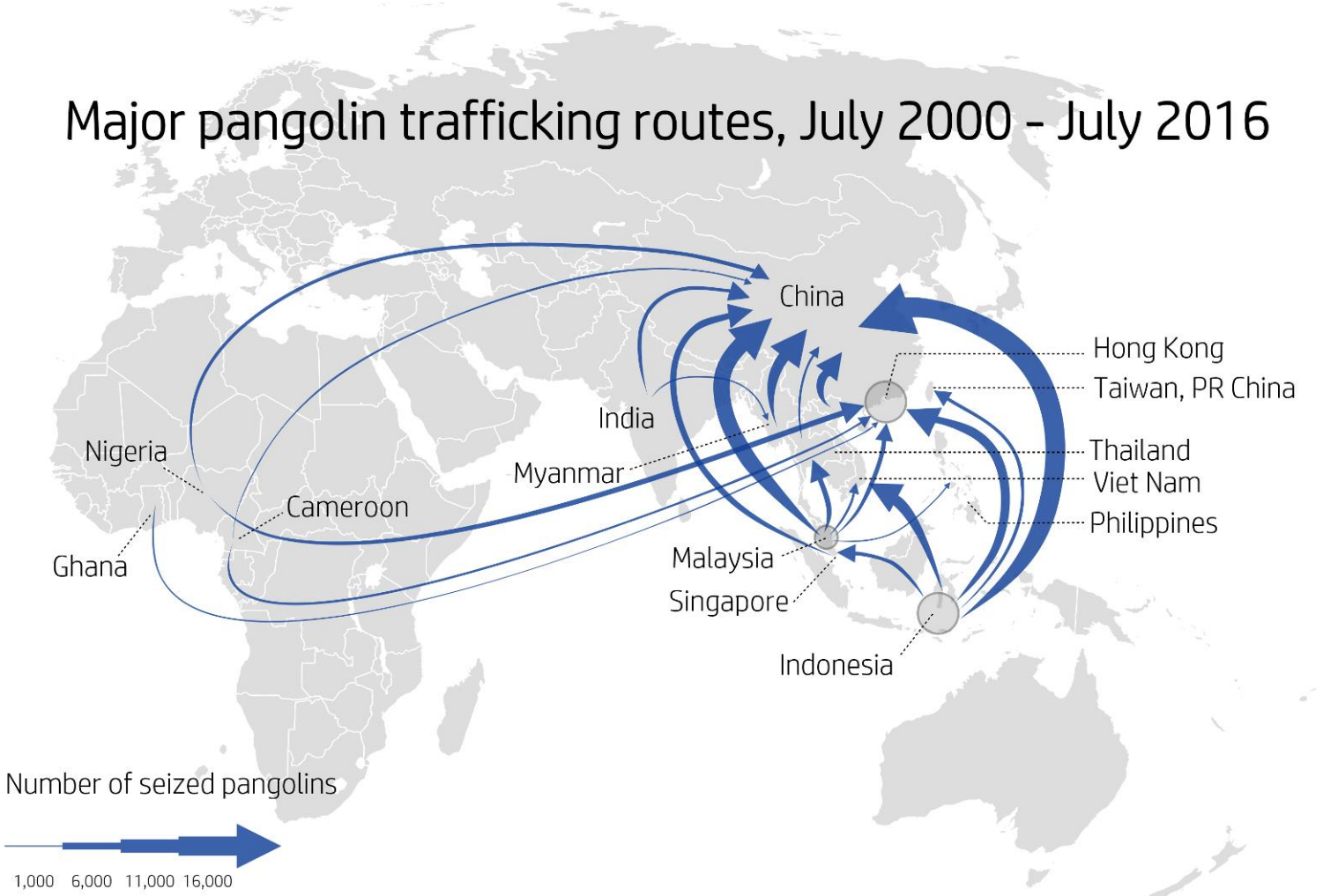


Figure 1: Pangolin trafficking routes along which >1,000 pangolins were trafficked between July 2000 and end July 2016. Arrow thickness is proportional to no. of pangolins (conversions apply).

Export	Destination	No. of pangolins
Indonesia	China	15980
Malaysia	China	13664
Myanmar	China	10814
Indonesia	Vietnam	8061
Indonesia	Hong Kong	7729
Vietnam	China	7401
Singapore	China	5018
Nigeria	Hong Kong	4885
Malaysia	Thailand	4342
Malaysia	Hong Kong	3727
India	China	3361
Indonesia	Singapore	3006
Nigeria	China	2789
Indonesia	Taiwan	2744
Cameroon	Hong Kong	2059
Thailand	China	1831
Malaysia	Vietnam	1816
Cameroon	China	1295
India	Myanmar	1191
Ghana	Hong Kong	1081
Malaysia	Philippines	1068

Table 1: Pangolin trafficking routes along which >1,000 pangolins were trafficked between July 2000 and end July 2016 based up on available information on export and destination from seizure data.

Legislation

13. In response to a request of the Pangolin Specialist Group from pangolin range states, to produce maps that can be used to inform future conservation and management actions, specifically depicting the country-specific laws and regulations governing management and trade of pangolin range states, maps have been produced (Figure 2). These maps depict whether species are fully protected or partially protected by principal national wildlife legislation, or whether they are not protected.

14. Our categorisation of fully protected refers to instances where legislation protects the species in question, typically by listing it as protected by legislation (e.g., through inclusion in a schedule) and prohibiting hunting, killing, injuring, destroying, capturing or similar activities. Partially protected refers to instances where species are offered some protection, but exceptions occur meaning they are not protected in certain circumstances, for example, hunting of the species may be permitted outside protected areas or with a permit. Not protected refers to instances where pangolins are not listed as protected species and/or may be exploited (e.g., as a game species).

15. In Asia pangolins are fully protected in each range state with one main exception. In Brunei Darussalam the Sunda pangolin *M. javanica* (the only species to occur there) is not listed as a protected species in the country's principal legislation, but does receive some protection under general biodiversity legislation. In Bhutan, the Chinese pangolin *M. pentadactyla* is not currently listed as a protected species in Schedule I of the country's principal piece of wildlife legislation (the Indian Pangolin *M. crassicaudata* is) but this legislation is being amended with the probable inclusion in Schedule I of *M. pentadactyla*. Singapore is notable for its legislation which protects all *Manis* spp., including all species of African pangolin.

16. In Africa the legislative protection afforded to pangolins is more variable. The Giant pangolin *M. gigantea* is fully protected in all range states with the exception of Tanzania (United Republic of) and Uganda where it is partially protected. Temminck's Ground pangolin *M. temminckii* is fully protected in some range states, is partially protected in Mozambique, Namibia, Rwanda, Swaziland, Tanzania

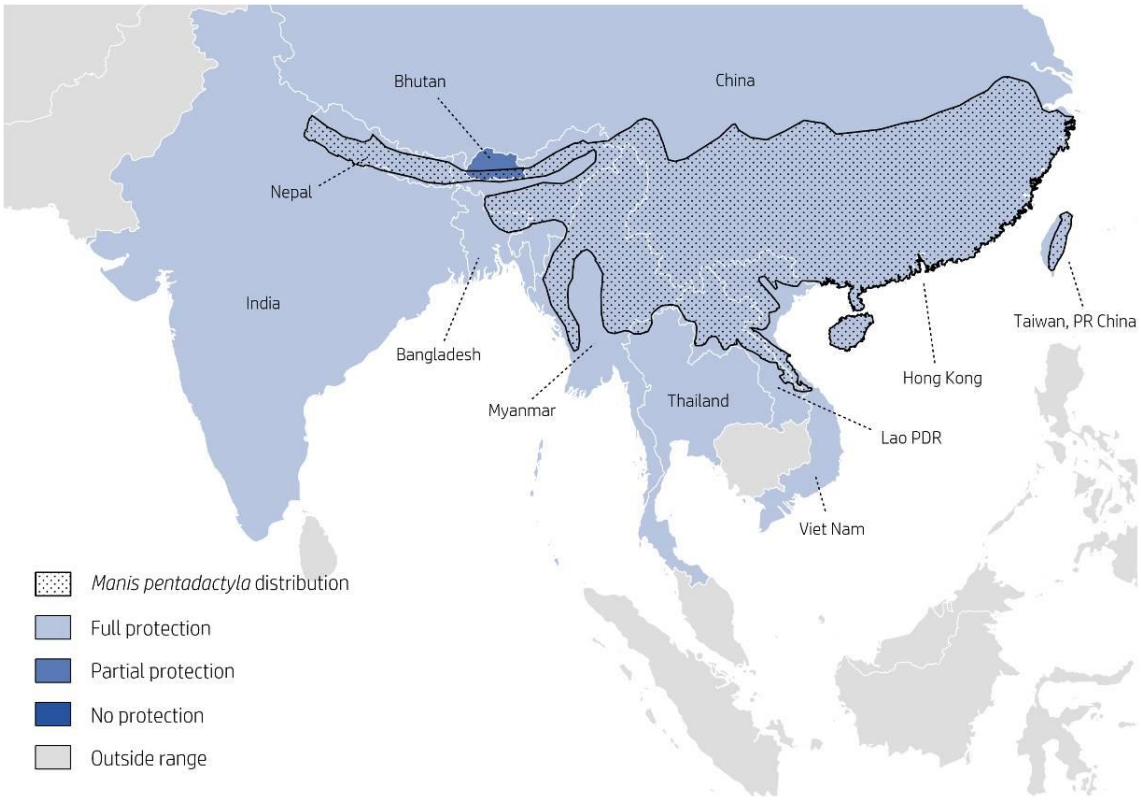
(United Republic of), Uganda and Zambia. It is not protected in the Central African Republic or Kenya.

17. The White-bellied pangolin *M. tricuspis* is fully protected in a number of countries (Benin, Congo, DR Congo, Equatorial Guinea, Ghana, Guinea, Nigeria and South Sudan), partially protected in others (Angola, Cameroon, Central African Republic, Cote d'Ivoire, Rwanda, Sierra Leone, Tanzania, Togo, Uganda and Zambia) but not protected in Gabon, Kenya or Liberia. The Black-bellied pangolin *M. tetradactyla* is fully protected in Equatorial Guinea, Ghana, Guinea, Liberia and Nigeria, partially protected in Cameroon, the Central African Republic, Cote d'Ivoire, DR Congo and Sierra Leone, but not protected in Congo or Gabon.

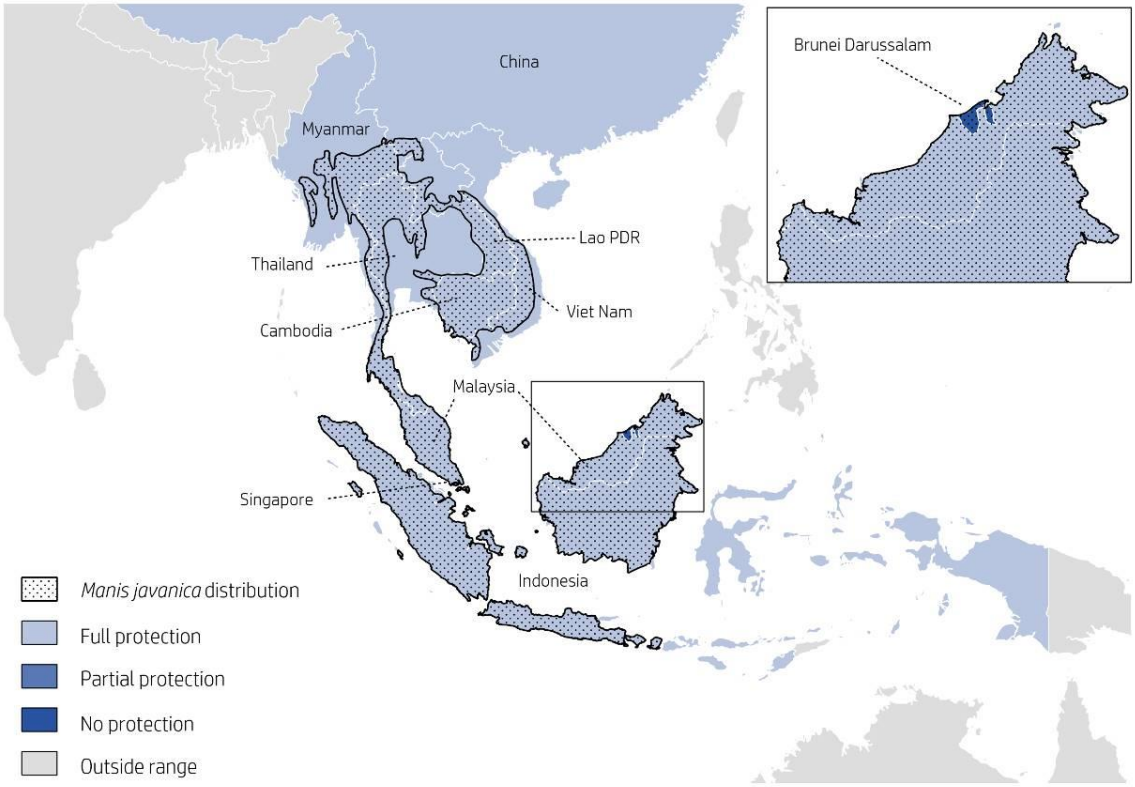
Figure 2: Maps depicting whether each of the eight species of pangolin are fully or partially protected, or are not protected by principal national wildlife legislation across range states.

Asia

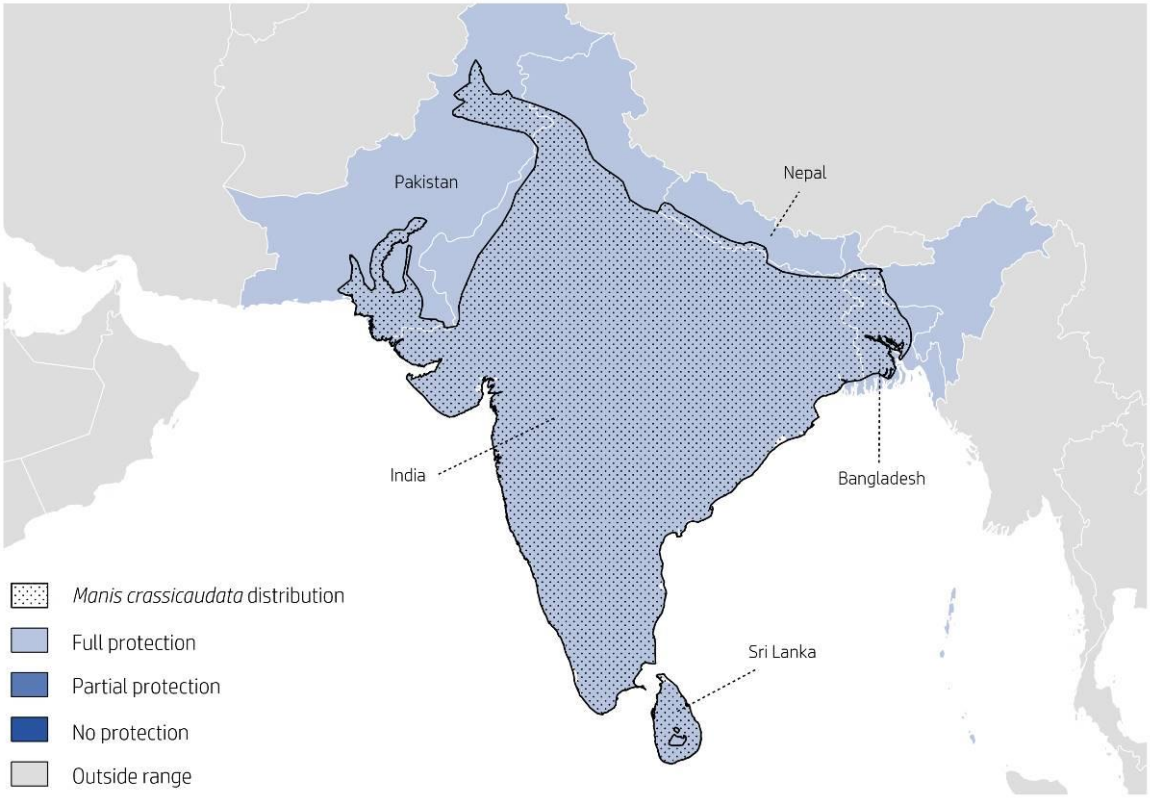
Chinese pangolin *Manis pentadactyla*



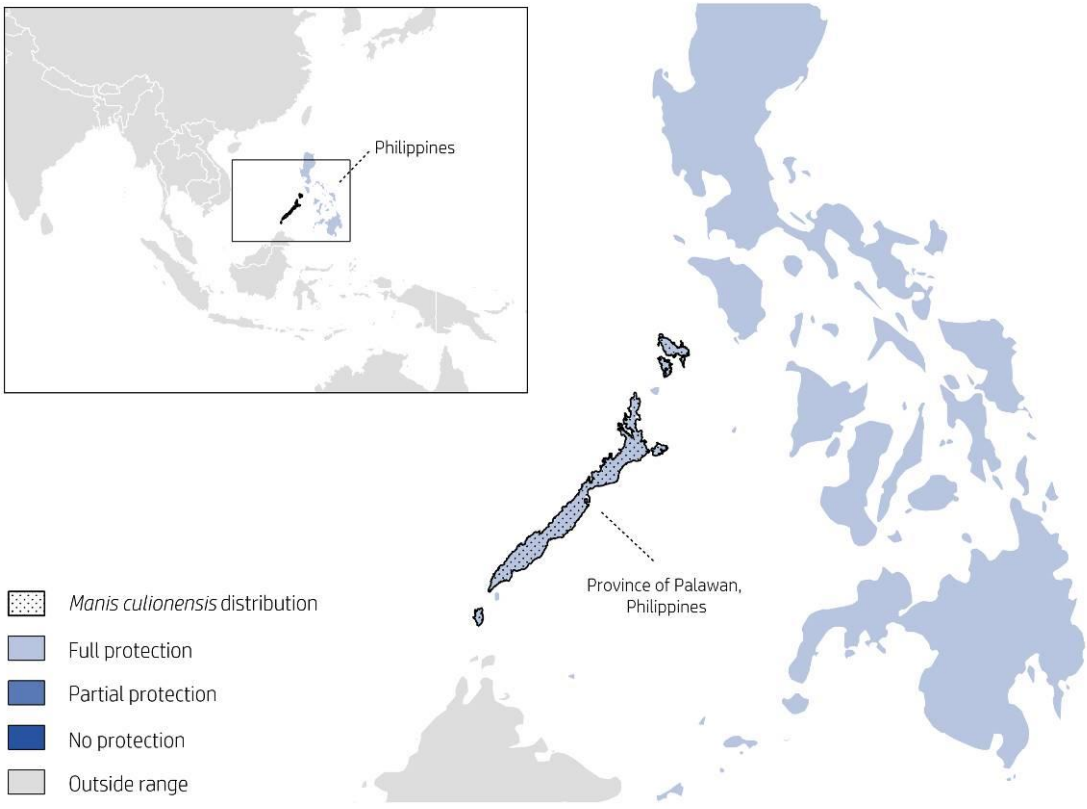
Sunda pangolin *Manis javanica*



Indian pangolin *Manis crassicaudata*

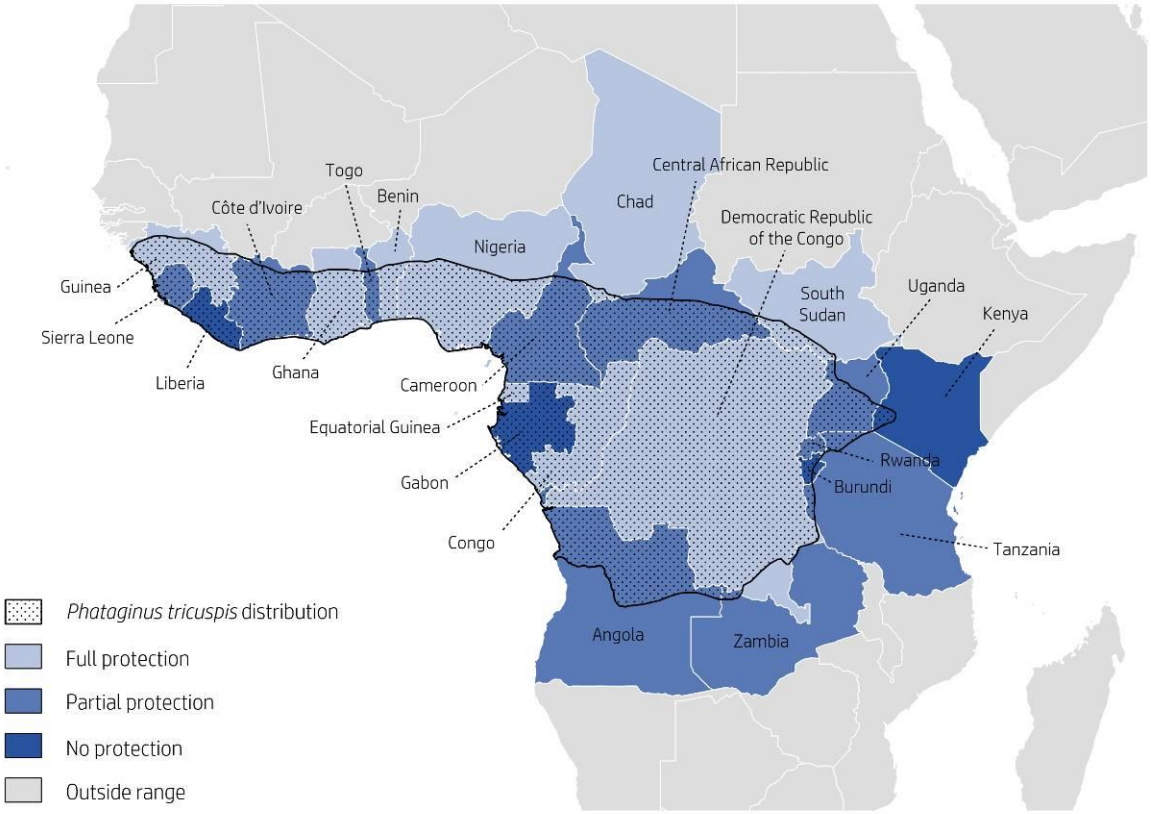


Philippine pangolin *Manis culionensis*

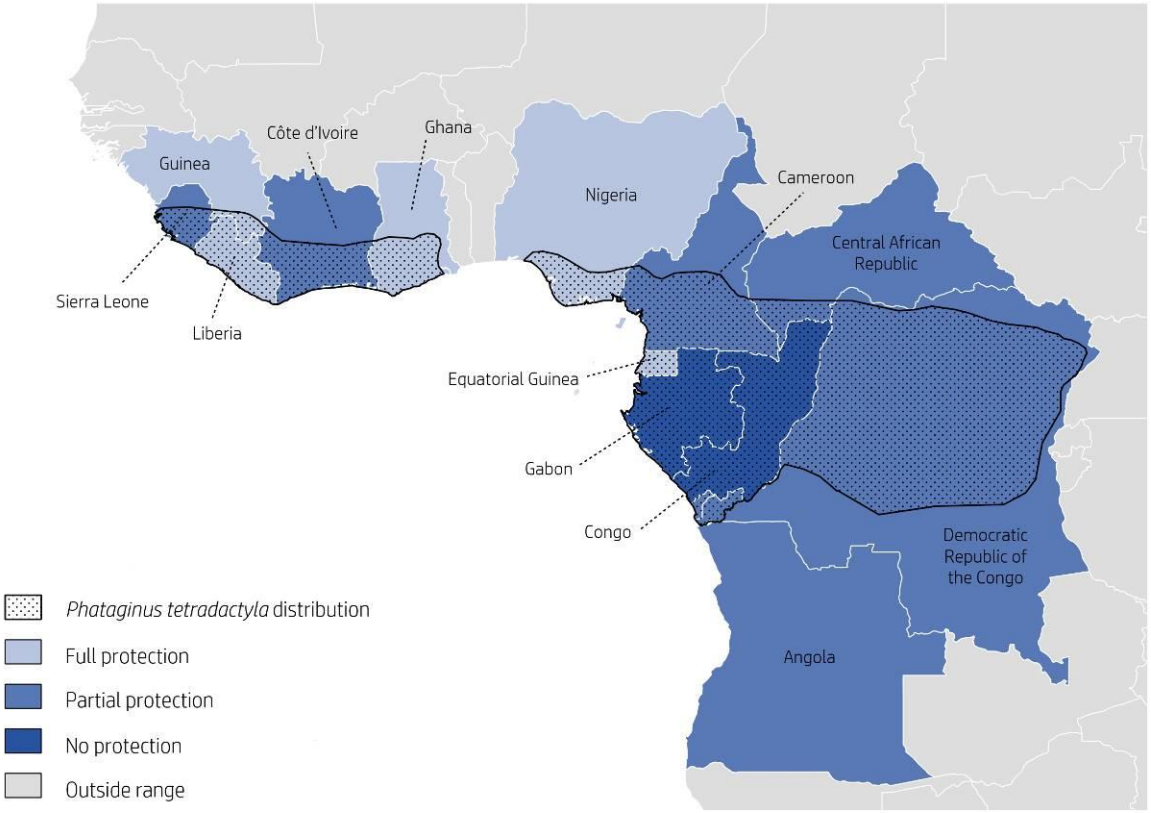


Africa

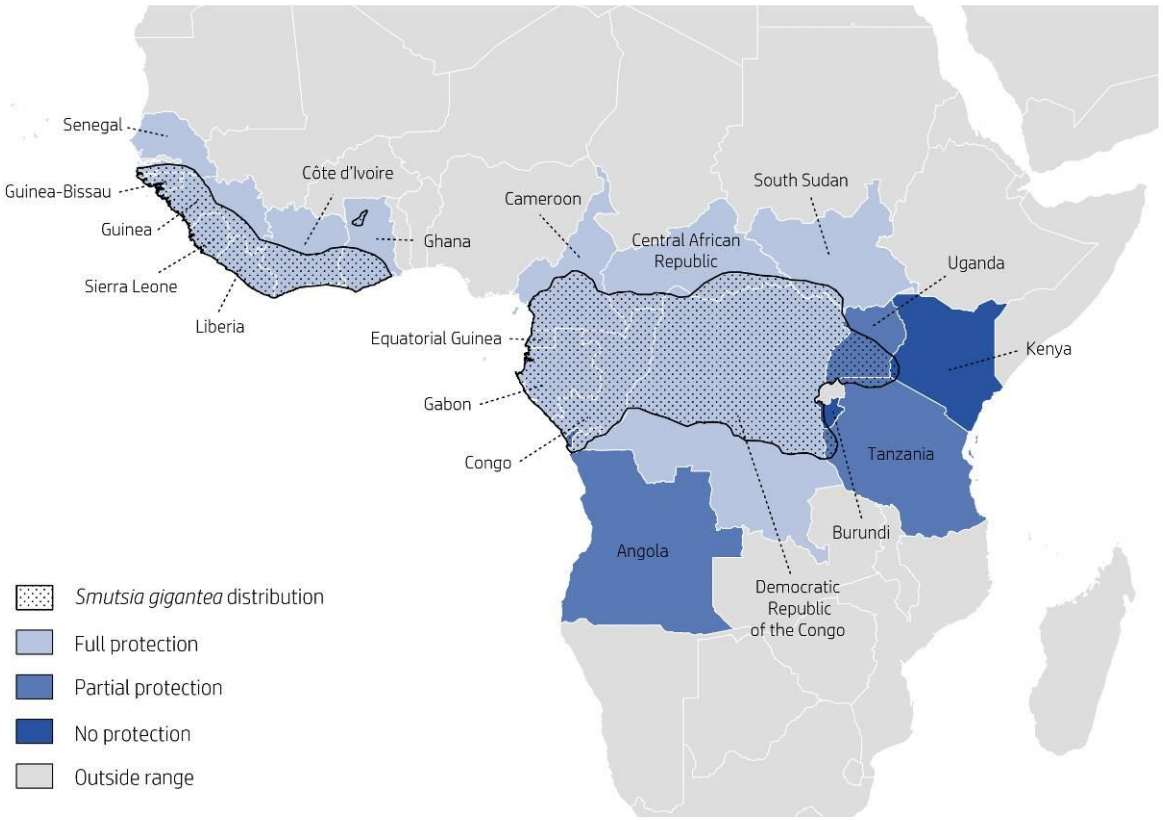
White-bellied pangolin *Manis tricuspis*



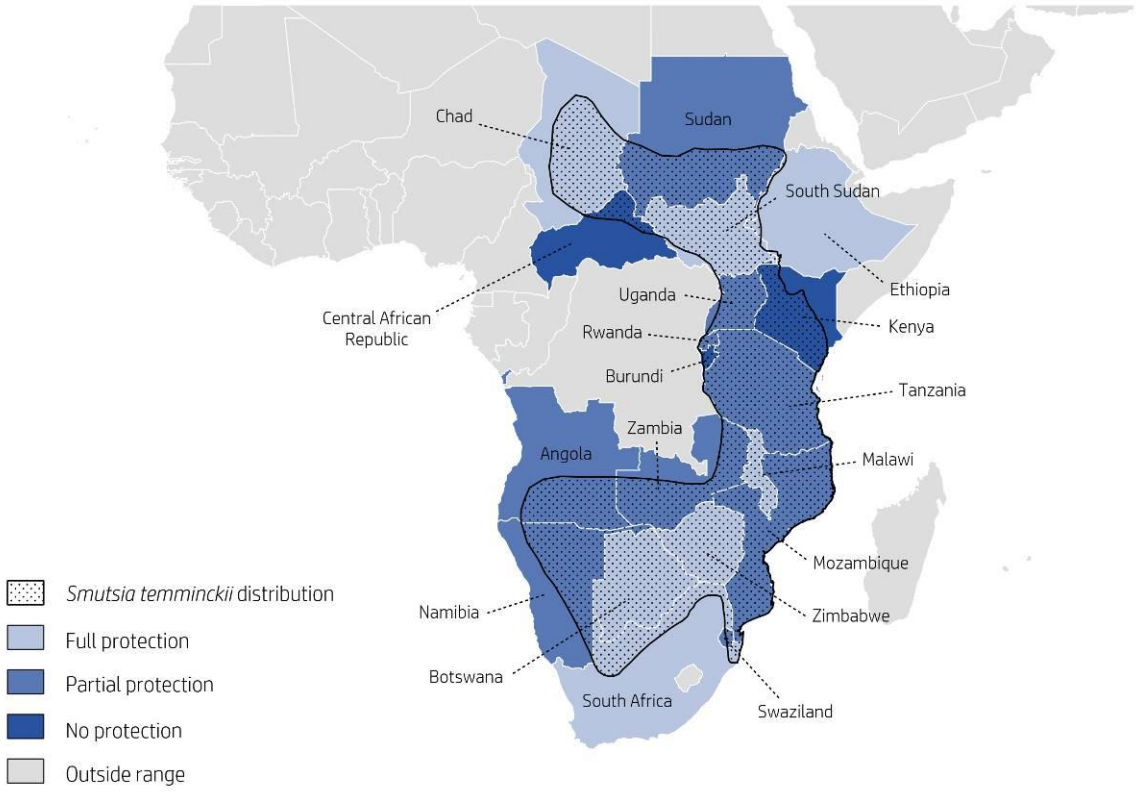
Black-bellied pangolin *Manis tetradactyla*



Giant pangolin *Manis gigantea*



Temminck's ground pangolin *Manis temminckii*



Use of pangolins in Asia and Africa

18. Pangolins are traded primarily for their meat, which is consumed as bushmeat or wild meat in Africa and Asia, and their body parts, particularly scales, which are used in traditional medicines. An analysis of illegal, international trade in pangolins between July 2000 and December 2013 indicates that 41% of this trade (by volume of animals) comprised pangolin scales, 31% live/dead animals and 26% meat (frozen pangolins), with negligible volumes (2%) of skins and other derivatives. Trade was destined primarily to China and Vietnam (Challender *et a*l. 2015).

19. Pangolin scales are used in traditional medicines throughout Asia, including in China and Vietnam, where they are used to improve blood circulation and stimulate milk secretion in lactating women, as well as to treat a wide variety of ailments, ranging from skin diseases to cancer (Challender *et al.* 2015; Mohapatra *et al*. 2015). In China, over 200 pharmaceutical companies legally manufacture 66 types of traditional Chinese medicine that contain pangolin derivatives (China Biodiversity Conservation and Green Development Foundation 2016).

20. Throughout the range of African pangolins, their scales have been historically and continue to be used in a range of medicinal and non-medicinal applications. These include possessing scales to protect against bad omens, burning the scales and using the smoke to ward off lions, and to treat a wide variety of medical ailments (Bräutigam *et al*. 1994; Sodeinde & Adedipe 1994; Soewu and Adekanola 2011; Boakye *et al*. 2015).

21. Pangolin meat continues to be consumed by local people in Africa and Asia today, often as an important source of protein, and recent research suggests current harvest rates in parts of Africa for bush meat and traditional medicines is unsustainable (Boakye et al. 2015). However, evidence suggests most illegal, international trade in pangolin meat is destined to China and Vietnam (e.g., Challender *et al*. 2015; Pantel & Chin 2009). It commands a high price among affluent consumers in these countries where it is considered a luxury dish and served to business elites and wealthy consumers in high-end restaurants (Shairp 2013; Challender *et al*. 2015).

Conservation

23**.** The IUCN SSC Pangolin Specialist Group published a pangolin conservation action plan, Scaling up Pangolin Conservation' in 2014. This action plan outlines key global conservation priorities for pangolins, including: developing protocols for monitoring wild populations; monitoring seizures, illegal trade levels, consumption and markets for pangolin products; identifying and protecting pangolin strongholds (sites containing viable populations of pangolins where threats are known and can be addressed); strengthening legislation and law enforcement where necessary; ensuring stockpile transparency; awareness raising; and reducing demand for pangolin products through targeted behaviour change programmes. The report on the First Pangolin Range States Meeting (CITES SC66 Doc. 50.2), co-hosted by the governments of Viet Nam and the US, provided a suite of similar recommendations to address conservation, management and enforcement to protect against over-exploitation of pangolins from illegal and unsustainable legal trade. The recommendations made by the CITES Intersessional Working Group (2015) further complement the Pangolin Specialist Group action plan.

24. The governments of Nepal, Singapore and Viet Nam are currently in the process of developing national pangolin action plans with technical support from Pangolin Specialist Group members. There is an urgent need to develop national pangolin action plans in the remaining pangolin Range States.

25. Potential pangolin strongholds have been identified based on expert opinion at the IUCN SSC Pangolin Specialist Group conservation conference held in Singapore in 2013 and at the First Pangolin Range States meeting held in Da Nang, Vietnam in 2015.

Pangolin farming and exploitation for zoological collections

26. There is recent evidence that there are attempts to farm pangolins on a commercial basis both in Asia (China and Lao PDR) and Africa (Uganda). The IUCN SSC Pangolin Specialist Group is alarmed by these efforts given uncertainty surrounding the impact of supply-side interventions as solutions to illegal trade in high-value species and derivatives, and the potential for farming enterprises to launder wild-caught pangolins as captive-bred. The unique biology of pangolins makes them extremely difficult and expensive to keep in captivity. They have a low survival rate, poor adaptability to captive environments, highly specialist diets of ants and termites, they rarely breed in captivity, and have a comparatively low reproductive output of one young a year, or every other year in some species. For these reasons, it would seem unlikely that the apparent high demand for pangolin products could be met through a legal supply of farmed pangolins and would likely result in the laundering of wild-caught animals as bred in captivity, with probable detrimental impacts on populations in the wild.

27. The IUCN SSC Pangolin Specialist Group is also alarmed by recent trade in wild-caught live pangolins from African range states to private collections outside of the species' range, and purportedly destined for zoological collections. These concerns arise over mortality rates of >80% in animals exported to date, and based on high mortality rates, the number of wild-caught pangolins that will be necessary to establish captive populations and the probable detrimental impact this will have on wild populations.

IUCN SSC Pangolin Specialist Group support to Range States

28. At the First Pangolin Range States Meeting in Da Nang, Vietnam (June 2015), the Pangolin Specialist Group was asked to help pangolin Range States in their efforts to conserve and manage pangolin populations by undertaking the following three pieces of work:

    a) *Produce maps that can be used to inform future conservation and management actions, depicting the country-specific laws and regulations governing management and trade of pangolins across range States in Africa and Asia; the distribution of each species; and legal and illegal trade routes.*

       Maps showing country-specific laws and regulations in pangolin range States have been produced for each species, and are included in this information document under legislation (paras 13-17).

       Maps showing major pangolin trafficking routes between July 2000 and end-July 2016 have also been produced and are included in this information document under legal and illegal trade levels and dynamics (paras 4-12; Figure 1; Table 1). All routes along which >1,000 pangolins have been traded have been mapped. It has not been possible to produce separate trafficking maps for each species as most seizures do not identify pangolin species below the genus level.

    b) *Develop standardised methods for accurately and reliably assessing pangolin population status.*

       The development of monitoring protocols for all eight species of pangolin is an urgent priority. Members of the Pangolin Specialist Group are currently working to develop standardised field methodologies (e.g., in Nepal, Singapore and Cameroon). However, additional resources will be required to expedite the development of standardised methods and members of the group are currently seeking further funds in order to be able to complete this request.

    c) *Disseminate guidelines on husbandry and welfare standards for pangolin confiscation facilities, rehabilitation facilities, rescue centres, and captive breeding centres that can be implemented and enforced by range, transit, and consumer countries.*

       These guidelines are still in development though there is some concern over making them public given their potential to inform efforts to undermine conservation efforts (e.g., through informing pangolin farming efforts).

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Annex 1 Range State legislation

Asia

Range State	Native species	Level of Protection				Principle National Legislation
		Manis pentadactyla	***Manis javanica***	***Manis crassicaudata***	***Manis culionensis***	
Bangladesh	*M. pentadactyla* (new record from east of country) *M. crassicaudata* (possibly extinct)	Full	Full	Full	None	Bangladesh Wildlife (Conservation and Security) Act 2012
Bhutan	*M. pentadactyla*	Partial	None	Full	None	Forest and Nature Conservation Act of Bhutan, 2006
Brunei Darussalam	*M. javanica*	None	None	None	None	Forestry Act (2002), Wildlife Protection Act (1981)
Cambodia	*M. javanica*	None	Full	None	None	Ministry of Agriculture, Forestry and Fisheries Declaration 020. Forestry Law 2002
China	*M. pentadactyla* *M. javanica*	Full	Full	Full	Full	Protection of Wildlife Act 1989 and Regulations on the Implementation of Protection of Terrestrial Wild Animals 1992.
Hong Kong SAR	*M. pentadactyla*	Full	None	None	None	Wild Animals Protection Ordinance 1976. Protection of Endangered Species of Animals and Plants Ordinance (Chapter 586) 2006.
India	*M. pentadactyla* *M. crassicaudata*	Full	None	Full	None	Wildlife Protection Act 1972 (Schedule I) [As amended 2003, 2006]
Indonesia	*M. javanica*	None	Full	None	None	Conservation on Biodiversity and Ecosystems Act No. 5 of 1990; Government Regulation on Conservation on Flora and Fauna No. 7 of 1999.
Lao PDR	*M. pentadactyla* *M. javanica*	Full	Full	None	None	Wildlife & Aquatic Law (2007)
Malaysia	*M. javanica*	Full	Full	Full	Full	Wildlife Conservation Act 2010 (as amended 2012)

Malaysia (Sabah)	*M. javanica*	None	Full	None	None	State's Wildlife Conservation Enactment 1997
Malaysia (Sarawak)	*M. javanica*	None	Full	None	None	Sarawak's Wildlife Protection Ordinance 1998
Myanmar	*M. pentadactyla* *M. javanica*	Full	Full	None	None	Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (1994)
Nepal	*M. pentadactyla* *M. crassicaudata*	Full	None	Full	None	Protected Animal in Schedule I of the National Parks and Wildlife Protection Act 1973 [As amended 1993].
Pakistan	*M. crassicaudata*	None	None	Full	None	Islamabad Wildlife (Protection, Preservation, Conservation, and Management) Ordinance, 1979; North-West Frontier Province Wildlife (Protection, Preservation, Conservation, and Management) Act, 1975
Philippines (Palawan)	*M. culionensis*	None	None	None	Full	Wildlife Resources Conservation and Protection Act (Philippine Wildlife Act 9147).
Singapore	*M. javanica*	Full	Full	Full	Full	Wild Animals and Birds Act 1965 (Amended, 2000). Wild Animals and Birds (Composition of Offences) Order 2005. Endangered Species (Import and Export) Act 2006 (As revised 2008)
Sri Lanka	*M. crassicaudata*	None	None	Full	None	Fauna and Flora Protection (Amendment) Act, No.22 2009.
Taiwan (PR China)	*M. pentadactyla*	Full	Full	Full	Full	Wildlife Conservation Law 1989 (Amended 1994)
Thailand	*M. pentadactyla* *M. javanica*	Full	Full	Full	Full	1992 Wild Animals Reservation and Protection Act B.E. 2535. (WARPA)

Viet Nam	*M. pentadactyla* *M. javanica*	Full	Full	None	None	Vietnam's Decree 32 (2006), Management of Endangered, Precious and rare Species of Wild Plants and Animals; Decree 160 (2013) On Criteria to Determine Species and Regime of Managing Species Under List of Endangered, Precious and Rare Species Prioritised Protection. Decree 82 (2006) On Management of Export, Import, Re-Export, Introduction from the Sea, Transit, Breeding, Rearing, and Artificial Propagation of Endangered Species of Precious and Rare Wild Fauna and Flora.

Africa

Range State	Native species	Level of Protection				Principle national legislation
		Phataginus tricuspis	***Phataginus tetradactyla***	***Smutsia gigantea***	***Smutsia temminckii***	
Angola	*P. tricuspis* *P. tetradactyla* (Cabinda) *S. gigantea* (Cabinda) *S. temminckii*	Partial	Partial	Partial	Partial	Ruling on the Protection of Land, Flora and Fauna, Decree no 40.040 of 1955
Benin	*P. tricuspis* *S. gigantea* - may be present in north	Full	Full	Full	Full	Wildlife Conservation and Hunting Act, Act no. 87-014 of 1987 and Hunting and Tourism Act, Act no. 93-011 of 1993
Botswana	*S. temminckii*	None	None	None	Full	Wildlife Conservation and National Parks Act of 1992
Burundi	No official records known, but possibly: *S. gigantea* *S. temminckii* *P. tricuspis*	None	None	None	None	Loi portant Commerce de faune et flore sauvage au Burundi
Cameroon	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Partial	Partial	Full	None	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 wildlife goods and Forestry, Wildlife and Fisheries Regulations, Law 94-1 of 1994
Central African Republic	*P. tricuspis* *P. tetradactyla* *S. gigantea* *S. temminckii*	Partial	Partial	Full	None	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
Chad	*S. temminckii* *P. tricuspis* possibly in SW	Full	Full	Full	Full	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

Congo Republic	*P tricuspis* *P. tetradactyla* *S. gigantea*	Full	None	Full	None	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.
Cote d'Ivoire	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Partial	Partial	Full	None	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
Democratic Republic of the Congo	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Full	Partial	Full	Partial	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 hunting regulations
Equatorial Guinea	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Full	Full	Full	None	Wildlife, Hunting and Protected Areas Act, Act no. 8/1988 of 1988
Ethiopia	*S. temminckii* - probably, marginally, in the western border regions	None	None	None	Full	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
Gabon	*P. tricuspis* *P. tetradactyla* *S. gigantea*	None	None	Full	None	Protection of Wildlife Act, Act 189/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
Ghana	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Full	Full	Full	None	Act 43: Wild Animals Preservation Act, 1961 and Wildlife Conservation Regulations, 1971
Guinea	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Full	Full	Full	None	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

Guinea-Bissau	*S. gigantea*	Full	Full	None	None	Decree-Law No. 2/2004 establishing the basic norms for protection, promotion and exploitation of Wildlife.
Kenya	*P. tricuspis* *S. gigantea* *S. temminckii*	None	None	None	None	The Wildlife Conservation and Management Act, Act no. 47 of 2013
Liberia	*P. tricuspis* *P. tetradactyla* *S. gigantea*	None	None	Full	None	Regulation on Revised Administrative Fees for Wildlife Conservation (FDA Regulation No. 25) 2000.
Malawi	*S. temminckii*	None	None	None	Full	National Parks and Wildlife Act, Act 11 of 1992 and National Parks and Wildlife (Protected Species) (Declaration) Order, 1994
Mozambique	*S. temminckii*	None	None	None	Partial	Forest and Wildlife Act, 1999
Namibia	*S. temminckii*	None	None	None	Partial	Nature Conservation Ordinance 4 of 1975.
Nigeria	*P. tricuspis* *P. tetradactyla* *S. gigantea* - presence uncertain, may occur in south	Full	Full	Full	None	Endangered Species (Control of International Trade and Traffic) Act, 1985
Rwanda	*P. tricuspis* *S. gigantea* - believed to be extinct S. temminckii	Partial	Partial	None	Partial	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
Senegal	*S. gigantea*	None	Full	Full	Full	Hunting and Wildlife Regulations, Law no. 86-04 of 1986 and Hunting and Protection of Wildlife Act, Act no. 86-844 of 1986
Sierra Leone	*P. tricuspis* *P. tetradactyla* *S. gigantea*	Partial	Partial	Full	Full	The Wild Life Conservation Act, Act no. 27 of 1972
Somalia	*S. temminckii* - presence doubtful	None	None	None	Full	Law on Fauna (Hunting) and Forest Conservation and Law no. 15 of 1969

South Africa	*S. temminckii*	None	None	None	Full	National Environmental Management: Biodiversity Act, Act 10 of 2004 (with 2013 revisions), and various provincial legislations
Sudan	*S. temminckii*	None	None	None	Partial	The Preservation of Wild Animals Ordinance No. 5 of 1935.
South Sudan	*P. tricuspis* *S. gigantea* (recent camera trap photo) *S. temminckii*	Full	Full	Full	Full	Wildlife Conservation and National Parks Act of 2003
Swaziland	*S. temminckii* - possibly extinct	None	None	None	Partial	Game (Amendment) Act, Act 4 of 1991.
Tanzania	*P. tricuspis* *S. gigantea* *S. temminckii*	Partial	None	Partial	Partial	Wildlife Act, 2013 and Wildlife Conservation (National Game) Order of 1974
Togo	*P. tricuspis*	Partial	Partial	Partial	None	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.
Uganda	*P. tricuspis* *P. tetradactyla* - occurs in Semliki valley and thus, just possibly, into Uganda *S. gigantea* *S. temminckii*	Partial	Partial	Partial	Partial	Uganda Wildlife Statute, Statute Number 14 of 1996.
Zambia	*P. tricuspis* *S. temminckii*	Partial	None	None	Partial	Zambia Wildlife Act, Act 12 of 1998 and The National Parks and Wildlife (Protected Animals) Order, Statutory Instrument no. 80 of 1993
Zimbabwe	*S. temminckii*	None	None	None	Full	Parks and Wild Life Act, 1975 (with 2012 Statutory Instruments)