

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Seventeenth meeting of the Conference of the Parties
Johannesburg (South Africa), 24 September – 5 October 2016

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

India has determined that *Manis crassicaudata* (Indian pangolin) meets the criteria for transfer from CITES Appendix II to CITES Appendix I, in accordance with Article II, paragraph 1, of the Convention.

The species is subject to increasing levels of poaching, principally for its meat and scales, both for local use and for illegal international trade. *M. crassicaudata* is currently classified as 'Endangered' on the IUCN Red List and the species is predicted to decline by 50% over the next two decades based on current rates of trade. Therefore, India proposes the transfer *M. crassicaudata*, from Appendix II to Appendix I in because it meets the biological criteria found in Resolution Conf. 9.24 (Rev. CoP16), Annex 1, paragraph C which states that there has been a marked decline in the population size in the wild:

- i) that has been observed as ongoing;
- ii) that can inferred or projected on the basis of a level or pattern of exploitation and a high vulnerability to intrinsic factors (i.e. low fecundity and specialized niche requirements).

B. Proponent

India, Nepal, Sri Lanka and the United States of America *

C. Supporting statement

1. Taxonomy

- 1.1 Class: Mammalia
- 1.2 Order: Pholidota (Weber, 1904)
- 1.3 Family: Manidae (Gray, 1821)
- 1.4 Genus, species or subspecies, including author and year: *Manis crassicaudata* (Gray, 1827)
- 1.5 Scientific synonyms: None
- 1.6 Common names:

English:	Indian Pangolin, Thick-tailed Pangolin
French:	Grand Pangolin de L'Inde, Grand Pangolin de l'Inde, Pangolin a Grosse Queue
Spanish:	Pangolín Indio

* The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.

1.7 Code numbers: *Manis crassicaudata*: A-108.001.001.001

2. Overview

Manis crassicaudata, the Indian or thick-tailed pangolin, is one of four pangolin species found in Asia. It occurs in six range States: Bangladesh, India, Nepal, Pakistan, Sri Lanka, and China (Baillie et al. 2014). Although *M. crassicaudata* was historically distributed from the Indian sub-continent to Yunnan province, currently it is believed to be extirpated or occurring only in low numbers in Bangladesh and China. *M. crassicaudata* is listed as Endangered on IUCN Red List based on a projected future decline of at least 50% in the next 21 years (three generations of 7 years each) (Baillie et al. 2014). Heavily hunted for local consumption, *M. crassicaudata* is now also increasingly poached for its scales and meat to supply demand in East Asia, primarily China (Baillie et al. 2014; Challender 2011; Mohapatra et al. 2015). International demand in this species has increased as a result of shifting trade due to the virtual extirpation of *M. pentadactyla* and *M. javanica* in East Asia (Baillie et al. 2014; Katuwal et al. 2013; Mahmood et al. 2012, Mohapatra et al. 2015). A rise in international trade of *M. crassicaudata* has been confirmed in the last decade by an increasing number of pangolin related confiscations; an estimated 1,690 *M. crassicaudata* specimens were confiscated from illegal trade between 2009 and 2014 in India alone (Mohapatra et al. 2015).

Although the true extent of trade is difficult to quantify, the combined pressure from local and international demand is likely unsustainable. *M. crassicaudata* is a secretive, solitary and primarily nocturnal mammal and therefore there are practical challenges to census or monitor the wild population of this species. Nonetheless, pangolins are particularly susceptible to overexploitation due to their very low reproductive output. Female pangolins give birth to one, or rarely two, offspring annually and therefore naturally occur at low population densities. (Gaubert 2011; Mahmood et al. 2014; Mohapatra & Panda 2014; Nowak 1999; Pietersen et al. 2014). In addition, pangolins are highly specialized to feed ants and termites, a factor that limits their distribution and makes them vulnerable to habitat change (Gaubert 2011).

All Asian pangolins, including *M. crassicaudata*, were included in Appendix II of CITES in 1975. Between 1977 to 2012 approximately 576,303 Asian pangolins were reported in the CITES trade database (Challender et al. 2015). On the basis that trade levels were likely unsustainable in the 1980's, pangolins were included in a Review of Significant Trade (RST) in 1988 (preliminary phase), 1992 (phase I) and 1999 (phase IV) (Reeve, 2002). The review process confirmed high volumes of illegal, international trade in Asian pangolins and reported hunting-driven population declines in many areas of the species' range. In the 1980's and 1990's alone, unreported trade involved between 505,423 – 935,369 pangolins (Challender et al. 2015). As a result, in 2000, CITES parties established zero export quotas for all wild-caught Asian pangolins traded commercially - in effect a proxy trade ban (CITES 2000a). Despite these measures, Asian pangolins continued to be illegally traded internationally (Wu and Ma, 2007; Challender et al., 2014a, 2014b, Challender et al. 2015). Based on confiscations of pangolins and their scales, more than 200,000 Asian pangolins were in trade between 2000 and 2013 (Challender et al. 2015). Rapid, recent population declines have been demonstrated in one area of Pakistan due to poaching for scales for international trade (Baillie et al. 2014, Mahmood et al. 2015); there are also indications of population declines related to poaching for scales for international trade in India (Mohapatra et al. 2015) and Nepal (Katuwal et al. 2013); and although the species was once widespread in Bangladesh, it may be extinct there now (Baillie et al. 2014). It is important to note that seizures are not reflected in the CITES Trade Database, even though Parties are directed to include information on seizures and confiscations in their annual reports. The Database contains only one instance of trade in *M. crassicaudata* during 2004-2013: one specimen was exported from Sri Lanka to the United States in 2008, where it was seized. Taking into account that only a fraction of trafficked wildlife is actually recovered from illegal trade, in the past decade more than one million pangolins may have been taken from the wild, which would make pangolins the "most heavily trafficked wild mammal in the world" (Challender et al. 2014).

Although protected from hunting and trade by national legislation in all range States, and despite a CITES zero trade quota established more than 15 years ago, *M. crassicaudata* is thought to be experiencing a significant decline due to poaching for international trade, primarily in scales, originating in India, Pakistan and Nepal and destined for Myanmar and China (Baillie et al. 2014, Katuwal et al. 2013, Mahmood et al. 2012, Mahmood et al. 2014, Mahmood et al. 2015, Misra and Hanfee 2000, Mohapatra et al. 2015, Sharma 2014). Therefore, India strongly supports the listing of *M. crassicaudata* in CITES Appendix I, in accordance with Resolution Conf. 9.24 (Rev. CoP16), Article II, paragraph 1. Specifically, Annex 1, paragraph C which states that there has been a marked decline in the population size in the wild:

- i) that has been observed as ongoing;

- ii) that can be inferred or projected on the basis of a level or pattern of exploitation and a high vulnerability to intrinsic factors (i.e. low fecundity and specialized niche requirements).

3. Species characteristics

3.1 Distribution

M. crassicaudata is predominantly distributed in South Asia from Eastern Pakistan through much of India south of the Himalayas (excluding northeastern portions of the country), Southern Nepal, and Sri Lanka. It is native to India, Bangladesh, Nepal, Pakistan, China and Sri Lanka. It is likely extirpated or much diminished in Bangladesh (Schlitter, 2005, Srinivasulu and Srinivasulu, 2012 Baillie et al. 2014). Many sources list the species' contemporary distribution to within South Asia alone (Corbet & Hill 1980; Gaubert 2011; Nowak 1999), yet some historical records extend the distribution to southwest China. The species' presence in China is presently uncertain (Yunnan Province, Heath, 1995; also see Smith and Xie, 2008).

3.2 Habitat

M. crassicaudata has been documented to inhabit various types of tropical forests as well as open land, grasslands and degraded habitat, including in close proximity to villages (Gaubert 2011; Zoological Survey of India, 2002). The species shows a preference for certain vegetation types, particularly when selecting a location to dig a burrow (Mahmood et al. 2014). *M. crassicaudata* is thought to adapt to modified habitats, provided its ant and termite prey remains abundant and provided it is not subject to hunting pressure (Baillie et al. 2014).

3.3 Biological characteristics

Pangolins, also known as scaly anteaters, are small to medium sized nocturnal, mammals (Gaubert 2011). As with other pangolins, *M. crassicaudata* is almost strictly myrmecophagous and therefore is highly adapted to feed on ants and termites, including eggs, larvae, young and adults (Gaubert 2011; Mahmood 2014). There is some evidence that pangolins specialize on specific species of ants and termites (Irshad et al. 2015). *M. crassicaudata* is predominantly terrestrial, nocturnal and burrow-dwelling (Baillie et al. 2014). Adults are generally solitary but males and females may share a burrow during the mating season (Baillie et al. 2014). Breeding behavior is poorly known. Females typically give birth annually to one young, rarely two, (Mohapatra & Panda 2014), although a recent study in Pakistan, reported that eight out of eleven field sightings identified one mother pangolin with two young pangolins (Mahmood et al. 2015). Gestation lasts 165 days and maternal care is provided for 5-8 months (Mohapatra and Panda 2012). Generation length is estimated at seven years (Baillie et al. 2014). Longevity in the wild is unknown but a captive individual survived for 13 years and two months (Baillie et al. 2014). Pangolins are particularly vulnerable to overexploitation due to their low reproductive output (Mishra and Panda 2012).

3.4 Morphological characteristics

The order Pholidota is one of the smallest and least diverse mammal orders (Gaudin 2009). All pangolins have a similar morphology and have a number of adaptations related to their diet of ants and termites including: a conical shaped head, strong claws for breaking apart insect nests, small eyes and thick eyelids, a long, sticky tongue for consuming their prey (Challender et al. 2014), and a muscular stomach with keratinous spines used for mashing their prey, as they have no teeth (Heath 1995). Pangolins are evolutionarily unique in that they are the only member of the class Mammalia covered in keratinous scales (Gaubert 2011). *Manis crassicaudata* is a medium-sized mammal (weight: 4.7 kg; length: 89 cm), that is covered with 11-13 rows of keratinous scales on the dorsal side (Heath 1995). The scales are used to protect themselves from predators (Spearman 1967). A threatened pangolin will roll into a ball with the hard, sharp-edged scales on the outside; females will protect their young at the center of the ball. While able to deter most predators, even lions, this otherwise highly effective anatomy and behavior unfortunately makes it easy for humans to pick up and transport pangolins. All Asian pangolin species, including *M. crassicaudata*, have hairs between their scales, while African species do not (Challender et al. 2014). Although mainly ground-dwelling, this species is arboreal in some habitats, and is a good climber, using its prehensile tail and claws to climb trees (Heath, 1995, Prater, 1980).

3.5 Role of the species in its ecosystem

Pangolins play an important role in their ecosystem by regulating insect populations (Challender et al. 2014). An adult pangolin consumes an estimated 70 million insects each year (IUCN Pangolin Specialist Group 2015). In addition, abandoned pangolin burrows become shelters for many other species of animals (Nguyen et al. 2014) and up to 200,000 ants may be eaten in one meal (Francis, 2008).

4. Status and trends

4.1 Habitat trends

Although *M. crassicaudata* has been found in human modified habitats, a large proportion of its range is now impacted by high human population density coupled with rapid loss and deterioration of habitat (Baillie et al. 2014). Loss of habitat is primarily due to expanding agriculture which has also led to an increase use of pesticides, a condition that is less than favorable for an insectivorous species (Zoological Society of India 2002). Loss of forest habitat in India was most dramatic from 1930 to 1975, but has since slowed as a result of conservation initiatives. None the less, large areas of forest remain fragmented and continue to be impacted by agricultural encroachment (Reddy et al. 2015). Nepal has lost 249,008 ha of tree cover between 2001 and 2014 and, as in India, forested habitats are increasingly fragmented due to infrastructure development in the form of roads and power lines (Reddy et al. 2015; Global Forest Watch 2016a, b). In addition, commercial extraction of non-timber forest products causes high levels of human disturbance ultimately leading to habitat degradation which may also increase exposure of pangolins to hunting. In India, an increase in the agrarian economy, improved irrigation and the use of pesticides are additional threats (Baillie et al. 2014).

4.2 Population size

There is virtually no information available on population levels of any species of Asian pangolin. There is a lack of research on population densities of *Manis crassicaudata* as with other pangolin species (WCMC et al. 1999 CITES, 2000). It is difficult to estimate population size because pangolins are shy, secretive, nocturnal and solitary (Mahmood et al. 2014). There are no global population estimates and only one published study that provides density estimates for the species in the Potohar Plateau of Pakistan where the average population density is estimated to be 0.010 ± 0.003 / ha (Mahmood et al. 2014). According to Mahmood et al. (2014), *M. crassicaudata* is believed to be almost completely extirpated in Bangladesh (Gaudin 2011). In India, the overall status of this species is not well known, though it is listed as Vulnerable in the Indian Red Data book (Tikader, 1983).

4.3 Population structure

There is almost no information on population demographics, proportion of mature individuals, or sex ratio of wild pangolin populations. The one exception is a recent study that found a highly biased male: female sex ratio of 16:5 in a population of *Manis crassicaudata* in the Potohar Plateau, Pakistan (Mahmood et al. 2015). There is a significant dearth of information and research on population structure for this species. Seizure records are indicative of high levels of indiscriminate offtake. However, due to the long life – expectancy of this species, a consequent lack of recruitment may not manifest as a population reduction for several years, hiding the impact of offtake.

4.4 Population trends

M. crassicaudata is listed as Endangered on the IUCN Red List (Baillie et al. 2014). It is suspected that populations of this species will decline by at least 50% in the next 21 years (generation length estimated at 7 years). The significant declines in *M. pentadactyla* and *M. javanica* have led to increased poaching of *M. crassicaudata* to supply East Asian demand (Challender 2011, Challender 2014). Poaching of this species for local use may already be unsustainable. Additional pressure from international trade may be accelerating declines (Mahmood et al. 2014). Listed as rare in Pakistan since the 1990's (Roberts 1997), rapid declines of *M. crassicaudata* have recently continued in parts of its range. Between 2010 – 2013, due to illegal hunting for its scales, population densities decreased from 1.08 individuals/km², to 0.23 per km² in the Potohar Plateau (Irshad et al. 2015; Mahmood et al. 2015). Despite little data on the population status of pangolins in India, Tikader (1983) reported that populations of *M. crassicaudata* have been greatly reduced by hunting. In a

report on seizures per year between 2009 and 2014, acknowledging the biases in seizure data, Mohapatra et al. (2015) indicated that decreasing volumes of seized pangolin scales could be associated with declining wild population. Although the species was described as rare in Bangladesh in the mid-1980s (Khan, 1985), Heath (1995) has suggested that *M. crassicaudata* is now extirpated in that country.

4.5 Geographic trends

M. crassicaudata has likely been extirpated from Bangladesh due to hunting (Khan 1985). Populations in Pakistan and India also appear to be in decline (Mahmood et al. 2012; Mohapatra et al. 2015). It is uncertain whether the species continues to persist in China (Gaubert 2011).

5. Threats

The main threat to the survival of *Manis crassicaudata* is poaching for its scales and meat, for local use and for illegal international trade, particularly in scales which are destined for Myanmar and China (Baillie et al. 2014, Jnawali et al. 2011). According to the IUCN Pangolin Specialist Group, hunting and poaching for illegal international trade in live animals, meat and scales primarily destined for Asia, mainly China and Viet Nam, is the main threats to pangolins (Challender et al. 2014). As populations of East Asian species (notably *M. pendadactyla* and *M. javanica*) have plummeted due to overexploitation for commercial purposes, wildlife traffickers have increased take of other species including *M. crassicaudata*. Confirmation of this is evidenced by its increasing presence in illegal confiscations (Chakkaravarthy 2012; Challender 2011, Challender et al. 2014). In the decade preceding 2014, an estimated one million pangolins were taken from the wild for illegal international trade, making pangolins the “most heavily trafficked wild mammal in the world” (Challender et al. 2014). As a result of this poaching and illegal trade, pangolin populations in Asia are in “precipitous decline” and have been extirpated from large areas, and African pangolins are now threatened as well (Challender et al. 2014). As Asian populations have declined, the market has begun to source pangolin and their parts from African species (Challender et al. 2014, Challender and Hywood 2012). While African pangolins were used historically and are used today by locals for food and medicine, an “alarming trend” has developed: an increased trade in parts of all four African pangolin species, mainly scales, from Africa to Asia (Challender et al. 2014, Challender and Hywood 2012). Although this species can adapt to modified habitats, a large proportion of this range has high human population density and rapid loss and deterioration of habitat, an increase in agrarian economy, improved irrigation and use of pesticides comprise additional threats to this species in India (Zoological Survey of India, 2002).

6. Utilization and trade

6.1 National utilization

Although protected from hunting by national law in each range State, *Manis crassicaudata* is poached for local use; meat is used as a source of protein and medicine as well as for ritual purposes; oil is extracted from the fat and the brain is used for medicinal purposes; the scales are used whole or in powdered form as medicine and are used to make curios, jewelry, and “bullet-proof vests”; and skins are used to make leather goods (Baillie et al. 2014, Katuwal et al. 2013, Mahmood et al. 2012, Misra and Hanfee 2000).

Although protected from hunting by national law in all range States, *M. crassicaudata* is still poached for local consumptive use. It is hunted for meat as a source of protein while the meat, bile, scales and claws are reportedly used by tribal communities (Chinlapianga et al. 2013; Mohapatra et al. 2015). This species has been hunted historically as a local source of protein and for medicinal purposes (Misra and Hanfee, 2000). It continues to be hunted for consumptive use, for example in the Western Ghats, India (Baillie et al. 2014) and ritualistically, in Eastern Indian states which poses a serious threat to the species (Zoological Society of India, 2002) while the meat, bile, scales and claws of pangolins are reportedly used by tribal communities (Mohapatra et al. 2015). The scales of *M. crassicaudata* are used whole, or in powdered form in the preparation of traditional medicines and as curios (Misra and Hanfee 2000). *M. crassicaudata* skins have also been used to manufacture leather goods such as boots and shoes (Baillie et al. 2014; Katuwal et al. 2013; Mahmood et al. 2012; Misra & Hanfee 2000). Pangolins are caught when sighted or are dug out of their burrows using different techniques including smoking the animals out and flushing them out with water; pitfall traps and dogs are also reported to be used to hunt and trap pangolins (Kumara, 2007; Mohanty, 2011; Gubbi and Linkie, 2012). The animals are then killed by being placed in boiling water or with the use of a club to render them unconscious (Mohanty, 2011). The scales are then typically removed by skinning the dead animal or peeling off the scales (Misra, 2000).

Local trade in the scales and meat of the Indian Pangolin has also been reported from Andhra Pradesh, Kerala, Odisha, Manipur, Mizoram, Tamil Nadu, Tripura and West Bengal (Mitra, 1998; CITES, 2000b; Misra, 2000). Finger rings made of pangolin scales have also been found for sale in Odisha (Mohanty, 2011). Despite regulations, pangolin body parts continue to be used in traditional medicines throughout India (Mitra, 1998).

6.2 Legal trade

Manis crassicaudata is protected from hunting and trade by national law in every range State (Baillie et al. 2014). In addition, since 2000, all four Asian pangolin species, including *M. crassicaudata*, have been listed on CITES Appendix II with a zero export quota of wild specimens for primarily commercial purposes. An examination of data in the CITES Trade Database 2004-2013 did not find evidence of legal international trade in the species of any type or for any purpose. However, as the Database contains numerous pangolin trade records for *Manis spp.*, it is possible that *M. crassicaudata* specimens were included in such trade. Legal trade in *Manis spp.* 2004-2013 included: 500 kg scales exported from Singapore to China for commercial purposes in 2010; and five derivatives and one leather product from Malaysia to United States for personal purposes in 2006.

6.3 Parts and derivatives in trade

Scales, meat and leather goods are the most common *Manis crassicaudata* specimens in illegal international trade, originating in India, Pakistan and Nepal and destined for Myanmar and China (Baillie et al. 2014). The scales of *M. crassicaudata* are used whole, or in powdered form in the preparation of traditional medicines and as curios (Misra and Hanfee 2000). *M. crassicaudata* skins have also been used to manufacture leather goods such as boots and shoes. Local trade in scales and meat have been reported from various Indian states (Mohapatra et al. 2015).

6.4 Illegal trade

For all pangolin species, the IUCN Pangolin Specialist Group identified hunting and poaching for illegal international trade in live animals, meat and scales primarily destined for Asia, mainly China and Viet Nam, as the primary threat (Challender et al. 2014). Pangolin meat is considered a luxury product in Asia, and pangolin scales are used in traditional Asian medicines to cure a variety of conditions (Challender et al. 2014): to disperse congealed blood, promote menstruation and lactation, reduce swelling, and dispel pain from stiffness or spasms in the limbs or ailments that prevent bending and stretching (Gaski and Johnson 1994). In the decade preceding 2014, an estimated one million pangolins were taken from the wild for illegal international trade, making pangolins the “most heavily trafficked wild mammal in the world” (Challender et al. 2014). Tons of pangolin meat and scales are confiscated in illegal international trade every year, even though pangolins are protected in most range States and international trade in Asian species has been prohibited since 2000 when the CITES Parties adopted a zero export quota for wild specimens for commercial purposes (Challender et al. 2014).

As a result of this poaching and illegal trade, pangolin populations in Asia are in “precipitous decline” and have been extirpated from large areas, and African pangolins are now threatened as well (Challender et al. 2014). As Asian pangolin populations have declined, the Asian market has begun to source pangolins from African species (Challender et al. 2014). While African pangolins were used historically by local people in Africa for food and medicine, and continue to be so used today, an “alarming trend” has developed whereby there is escalating trade in parts of all four African pangolin species, mainly scales, from Africa to Asia (Challender et al. 2014, Challender and Hywood 2012, Pietersen et al. 2014, Waterman et al. 2014a, b, c).

Although protected from hunting and trade by national legislation in all range States, *M. crassicaudata* is poached and traded illegally and this is causing the decline of wild populations (Baillie et al. 2014). Specimens of the species, primarily scales, originate in India, Pakistan and Nepal and are destined to Myanmar and China (Baillie et al. 2014). This conclusion is based on several field studies discussed below.

Misra and Hanfee (2000) conducted an 8-month survey in East India, visiting markets and meeting with people in West Bengal and Orissa during 1997 and 1998. They found that hunters used dogs to track pangolins; the scales were extracted after killing and skinning the animals; and scales from one animal weighed 1 kg on average. Scales were regularly sold in markets and, in addition to being used

locally, were destined for Nepal and Myanmar; the price at the collection point was INR 250-500/kg, at the main trading centers was INR 500-1000/kg, and at the border trading centers was INR 7,000-8000/kg.

Sharma (2014) described trade of pangolin scales from northeast India to Nepal and Myanmar and then on to China. Details are provided of seven seizures in India during 2013, totaling 399 kg of pangolin scales, two major seizures in 2010 totaling 1,205 kg, and another in 2012 of 380 kg. From these details, a general pattern of trade emerged: local hunters poach and kill pangolins; the meat is consumed or sold in local markets while the scales are delivered to middlemen who may have made advanced payments to the poachers; such middlemen live in larger cities or border towns; the scales are transported by rail, air or post, eventually reaching border towns near Nepal or Myanmar; and from there, the scales are transported to China.

Mohapatra et al. (2015) studied reported seizures that took place over a six-year period (2009-2014) and found that seizures took place in ten States in India and that more than 5913 kg of scales and two whole pangolins were seized. Scales were delivered to middlemen from Kolkata located in the far eastern part of India near Bangladesh, Chennai located on the southeast coast, and border towns near Bangladesh, Nepal, Bhutan and Myanmar. From there the scales are destined for China via Myanmar and Nepal. Myanmar and Nepal nationals caught with pangolin scales, and Indian nationals caught with Myanmar currency support the authors' findings about this trade. Smugglers confessed that the scales originated in various Indian States. This study found that decreasing volumes of pangolin scales (measured in kg) were seized over the period of the study which may indicate increasing rarity of the species. Pangolin scales were reported to be sold for Rs 1000 /kg in 1996 but increased to Rs 12,000-13,000/kg in 2013 in the same city. The authors concluded that increasing prices and persistence of trade is linked to demand in China.

Mahmood et al. (2012) documented poaching and trade of 118 *M. crassicaudata* over a 17-month period during 2011 and 2012 in four districts in Pakistan's Potohar Plateau region. Nomads and trained local hunters were involved in the poaching; pangolins were boiled alive in water to remove the scales and the body was discarded; the scales were used in illegal local and international trade; and the scales were used to make "bullet-proof" jackets which are in demand in Pakistan, and for traditional Chinese medicine. Local sources indicated that scales were regularly transported from the study area to Islamabad and Lahore in Pakistan. The study documented the transport of 24 kg of scales from Chakwal to Islamabad during Feb 2012 which was believed to be linked to a subsequent seizure in China in April 2012, of 25.4 kg of pangolin scales; the smuggler, a Chinese national, admitted to obtaining the scales when he was working in Pakistan and said that he was planning to sell them in China. Mahmood et al. (2014) confirmed that *M. crassicaudata* is being poached frequently in the study area to obtain scales. Mahmood (2015) found the average population density of the species in the Potohar Plateau region was estimated at 1.08 /km² individuals during the year 2010, 0.36/km² individuals in 2011 and 0.23/km² individuals in 2012, demonstrating a rapid decline of approximately 79% over a period of three years due to illegal hunting for its scales.

Katuwal et al. (2013) documented pangolin trade in eastern Nepal (*M. pentadactyla* and *M. crassicaudata*) through news reports in national daily newspapers in 2011-2013 and found seizures totaling approximately 80 kg of scales and six live pangolins. The reports indicated that scales were destined for China over the Nepal-China border. The authors then studied pangolin trade in four districts in eastern Nepal. Interviews with local people indicated that pangolin scales were traded from village to village, finally reaching the China border; scales were also sold in local markets and people come from China to buy them. The price for scales was Rs 10,000–15,000/kg to Rs 40,000–50,000/kg and higher at the border. The authors concluded that pangolin trade was the major problem for survival of pangolins in the area, pangolin hunting was increasing, poachers were using local youth to trap pangolins, local people know about the poaching but did not report it to officials, and the pangolin population was decreasing rapidly in the area due to illegal hunting and trade.

In addition to field studies, there have been numerous seizures of pangolins and their parts in recent years. However, most seizures do not identify the species of pangolins involved, making the true scale of illegal international trade in any one pangolin species impossible to ascertain. Nonetheless, during 2004-2013, 219 seizures were made that included an estimated 33,008 individual pangolins and a total of 195,127 kg of pangolins and their products were involved (37,560 kg of scales, 109,866 kg of meat, and 55,544 kg of bodies) (Hofberg et al. 2015). Hoffberg et al. (2015) estimated that these seizures involved approximately 96,410 individual pangolins. Using an INTERPOL rule of thumb that suggests that seizures represent only 10% of the actual black market trade volume

(Christy 2012), Hoffberg et al. (2015) estimated that 964,150 individual pangolins were trafficked between 2004 and 2014. This estimate is likely still conservative in comparison to actual trade volume, but it nonetheless echoes the IUCN SSC Pangolin Specialist Group's estimate of over one million pangolins trafficked over the past decade (Challender et al. 2014).

It is important to note that these seizures are not reflected in the CITES Trade Database, although Parties are directed to include information on seizures and confiscations in their annual reports. The CITES Trade Database shows that Asian pangolin specimens were seized in large numbers but mostly by the United States and other countries (such as New Zealand, United Kingdom, and Japan) not considered to be the major consumers. According to information in the CITES Trade Database, seizures by major consuming countries such as China and Viet Nam did not occur. Seized Asian pangolin specimens in trade for commercial purposes included: derivative items (ten), live (two), medicine items (ten), loose scales (12), and scales measured in grams (2045 g). Many other specimens identified only as *Manis* spp. but potentially Asian species because they were exported from Asia, were seized from commercial trade including: 1243 derivatives, 30 medicines, and 500.13 g scales. The Database contains only one instance of trade in *M. crassicaudata* during 2004-2013: one specimen was exported from Sri Lanka to the United States in 2008, where it was seized.

The difficulty of identifying pangolins and their parts and products in trade to the species level complicates enforcement. Enforcement is especially problematic when pangolin species have different levels of protection as is currently the case. While it is possible to distinguish amongst pangolin species when they are whole specimens or live animals (Challender et al. 2014), it is not possible to visually identify dried, loose and powdered scales to the species level (Hsieh et al. 2011). DNA analysis can be used to identify scales to the species level for forensic purposes, but it is not feasible for law enforcement officials to employ such analytical tools for every seizure of scales (Hsieh et al. 2011).

6.5 Actual or potential trade impacts

According to IUCN, the current population trend of *Manis crassicaudata* is declining and, specifically, there is a continuing decline of mature individuals (Baillie et al. 2014). The species is classified as Endangered by IUCN based on the fact that "it is suspected populations of this species will fall by at least 50% in the next 21 years (generation length estimated at 7 years) given the significant declines in *M. pentadactyla* and *M. javanica* over the last decade and the transfer of trade attention to other pangolin species following the formers' collapse" (Baillie et al. 2014). Although protected from hunting and trade by national legislation in all range States, *M. crassicaudata* is poached in India, Pakistan and Nepal and trafficked to China, often via other range States or Myanmar (Baillie et al. 2014, Misra and Hanfee 2000, Sharma 2014, Mahmood et al. 2012 and 2014, Mohapatra et al. 2015, Katuwal et al. 2013). Recently published field studies in India (Mohapatra et al. 2015), Nepal (Katuwal et al. 2013), and Pakistan (Mahmood et al. 2012, Mahmood et al. 2014, Mahmood et al. 2015) have provided additional indications that poaching and illegal international trade are the main threat and are having a negative impact on wild populations. In the only study of its kind on this species, Mahmood (2015) found the average population density of the species in the Potohar region of Pakistan declined from 1.08 /km² individuals during the year 2010, 0.36/km² individuals in 2011 and 0.23/km² individuals in 2012, demonstrating a rapid decline of approximately 79% over a period of three years due to illegal hunting for its scales.

The evidence of illegal trade (Section 6.4), the lack of compliance and effective national management plans, along with evidence of declining populations, are indicative that the species qualifies to be transferred to Appendix I. Zero export quotas established in 2000 have failed to curb illegal trade in pangolins, or stem their decline. Evidence from seizures is supportive of continuing demand for pangolin derivatives, principally scales in China and Vietnam (noting that many countries cannot enforce Appendix II as effectively as Appendix I). Large volumes of seizures within a context of low productivity, long generation lengths and slow growth implies significant impacts of exploitation on wild populations with noticeable declines, further range reductions and ultimately, extinction.

7. Legal instruments

7.1 National

Manis crassicaudata is protected from hunting and trade in all range States (Baillie et al. 2014):

Country	National Laws that include protection for <i>M. crassicaudata</i>
Bangladesh	Wildlife (Conservation & Security) Act 2012;
China	Protection of Wildlife Act 1989
India	Wildlife Protection Act 1972
Pakistan	the Islamabad Wildlife (Protection, Preservation, Conservation, and Management) Ordinance, 1979 and the North-West Frontier Province Wildlife (Protection, Preservation, Conservation, and Management) Act, 1975
Nepal	National Parks and Wildlife Protection Act (1973, as amended 1993)
Sri Lanka	Fauna and Flora Protection (Amendment) Act (No. 22) 2009

7.2 International

Manis crassicaudata is listed on CITES Appendix II with an annotation containing a zero export quota for wild-caught specimens traded for commercial purposes, established in 2000. It is protected by national legislation in Bangladesh, India, Pakistan, Nepal, Sri Lanka and China.

8. Species management

8.1 Management measures

Programs to manage wild populations of any of the eight species of pangolins do not exist in any range State. There are no direct management measures for this species in place in any of the range states.

8.2 Population monitoring

Pangolin population monitoring programs do not exist in any range State. The secretive and solitary nature of pangolins makes monitoring wild populations difficult.

8.3 Control measures

8.3.1 International

There are no international measures in place other than CITES to control the movement of pangolin specimens across international borders. However, all range States are members of the South Asian Wildlife Enforcement Network (SAWEN), a regional network with a mission to strengthen, promote and coordinate regional cooperation for curbing illegal wildlife trade that threatens wild flora and fauna in South Asia (SAWEN 2016).

8.3.2 Domestic

Manis crassicaudata is protected by national law from hunting and trade in all range States (Baillie et al. 2014). Given the widespread poaching and illegal domestic and international trade in the species, there is a need for greater enforcement and other measures to prevent poaching.

In India January 2014 the Wildlife Crime Control Bureau in New Delhi, India, issued an alert to police, forest, Customs and postal authorities throughout the country to highlight the extent of this trade; subsequently, one person apprehended with 10.7 kg of pangolin scales in November 2014 was sentenced to two months' imprisonment, suggesting that this alert may have started to translate into enforcement action and subsequent prosecutions (Sharma, 2014).

In Pakistan, Indian Pangolin is "Protected" under respective provincial wildlife legislations and its hunting, killing, capturing and trade is completely banned. Any violation is punishable with imprisonment or a fine or with both. Provincial wildlife authorities ensure strict enforcement in and around the protected areas. In view of the illegal killing of the species, field staff have been sensitized to check any illegal activity. Provincial Wildlife Departments have launched an active campaign in Potohar Region and other potential areas for conservation of pangolins.

In Nepal, domestic use of pangolins is not regulated. Joint operation is conducted in close coordination by law enforcement agencies (Department of National Parks and Wildlife Conservation, Central investigation bureau, Nepal Police, Nepal army, Department of Forest) as per requirements of Operation Cobra I, Operation Cobra II and other normal, regular patrolling activities.

Bangladesh Forest Department has established a Crime Control Unit (WCCU) for protection and conservation of wildlife species of the country.

In Sri Lanka, hunting of *M. crassicaudata* is prohibited (Broad et al . 1988).

Efforts to address wildlife trafficking generally have occurred recently in Bangladesh (CITES Secretariat 2015), India (TRAFFIC 2016), Nepal (Neme 2014), Pakistan (Jaffri 2015), and Sri Lanka (TRAFFIC 2011).

8.4 Captive breeding and artificial propagation

In general, pangolins do not survive well in captivity and can suffer 71% mortality in the first year of captivity (Wilson, 1994). Reports indicate that over the past 150 years, more than 100 zoos or organizations have attempted to maintain pangolins. Most captive pangolins died within six months, although some were held for two to three years, and a few individuals lived for 12–19 years. Zoo records for pangolins in captivity from 1877 to 2001 had been reviewed by Yang (Yang et al. 2007). More recently, Hua et al. (2015) provide a review of pangolins in captivity and indicate that poor adaptability to captive environments, highly specialized natural diet, poor understanding of pangolins' reproductive biology, and weak immune systems are some of the technical challenges underlying poor survival and breeding in captivity. However, captive births of both *M. crassicaudata* and *M. pentadactyla* have occurred (Masui, 1967; Ogilvie and Bridgewater, 1967). It is not known how many of any of the species are held in captivity at present.

The Nandankanan Zoological Park in India has maintained *Manis crassicaudata* in captivity since 1982 and, in 2008, established a Pangolin Conservation Breeding Centre to develop proper housing, husbandry and captive breeding for conservation purposes (Mohapatra and Panda 2014). Pangolins are difficult to maintain in captivity; stress and malnutrition are the major causes of death of captive pangolins; and the mortality rate of wild-caught Indian pangolins is 67% within one year in captivity (Mohapatra and Panda 2014). Wild-caught pangolins have mated and given birth at the Centre (Mohapatra and Panda 2014); however of 20 births at the Center between 1971 and 2011, only four pangolins survived more than a year (Mohapatra and Panda 2014). There is no evidence of successful breeding of pangolins born at the facility to the F2 or second generation. Indeed, over the past 150 years, more than 100 zoos or organizations have attempted to maintain pangolins but most captive pangolins died within six months; captive breeding of pangolins is still difficult, and there are no reports of successful reproduction to the second generation (Hua et al. 2015).

8.5 Habitat conservation.

M. crassicaudata is understood to occur in various types of tropical forests as well as open land, grasslands and degraded habitat, including in close proximity to villages (Zoological Survey of India, 2002). The species is thought to adapt well to modified habitats, provided its ant and termite prey remains abundant and provided it is not subject to hunting pressure. However, a large proportion of the species range overlaps with high human population densities and significant anthropogenic disturbance which can be expected to have negative repercussions for the species. However, further research is required into habitat utilization and the ability of this species to persist in various habitat types. Deforestation and human disturbance both inside and outside protected areas across the range of the species needs to be reduced as habitat loss is linked with increased access and increased vulnerability to hunting. Given the insatiable demand and high commercial value

associated with meat and scales, habitat protection will be critical to prevent hunting that could ultimately lead to local extinctions of the species.

8.6 Safeguards

This species was included in CITES Appendix II and zero annual export quotas were established in 2000 (CoP11) for wild-caught specimens traded for primarily commercial purposes. It is protected by national legislation in Bangladesh, India, Pakistan, Nepal, Sri Lanka and China. Other than the legal instruments previously described, no safeguards are in place for this species.

9. Information on similar species

All four species of Asian pangolins are morphologically similar with differences in the number and size of scales, size of fore claws and ears and the ratio of head and body to tail length (Wu et al. 2004; Gaubert and Antunes, 2005). *M. pentadactyla* has relatively longer front claws, larger ears, and fewer rows of scales on the tail (14 to 17 instead of about 30) than *M. javanica* (Wu et al. 2004). Although similar morphologically to the Chinese pangolin and the Sunda pangolin, the scales of the Indian Pangolin are relatively larger than those of the Chinese Pangolin and have 11–13 rows of scales across the back compared to 15–18 rows in the Chinese Pangolin and upto 30 rows of scales in the Sunda Pangolin. A terminal scale is also present on the ventral side of the tail of the Indian Pangolin, but absent in the Chinese Pangolin (Pocock, 1924; Heath, 1995; Prater, 2005). Interscale bristles are unique to Asian pangolins (Challender, 2011). However, scales are the most common derivatives found in trade and it is difficult to confirm species identity from isolated scales of the four species of Asian pangolins. DNA forensic studies have been applied to species identification from pangolin scales (Hsieh et al. 2011) and Zhang et al. (2015) have recently shown that molecular tracing of confiscated pangolin scales is feasible.

There are no other species similar to pangolins. However it is difficult for non-experts to distinguish amongst pangolin species in trade, and not possible to visually identify to the species level pangolin scales and scale powders, which are the most common derivatives in trade.

There are eight pangolin species found in Asia and Africa, and although very similar in appearance there are some morphological differences.

Asian species include:

- *Manis pentadactyla* (Chinese pangolin)
- *Manis javanica* (Sunda or Malayan Pangolin)
- *Manis culionensis* (Palawan pangolin)
- *Manis crassicaudata* (Indian or Thick-tailed pangolin)

African species include:

- *Manis tricuspis* (African white-bellied pangolin)
- *Manis tetradactyla* (Black-bellied pangolin)
- *Manis gigantea* (Giant pangolin)
- *Manis temminckii* (Temminck's ground pangolin)

The differences between African and Asian species are important when considering identification of pangolins found in international trade. Whole pangolins can be identified to their continent of origin based on several characteristics. For instance, scale patterning in African species is three-cusped while Asian species have V-shaped scales. Additionally, African species do not have hairs between the scales whereas in Asian species hairs are present. Scales found on the mid-line of the tail do not reach the tip in African species but do in Asian ones. Asian species have ear flaps (pinnae) whereas African species do not. Less apparent is the difference in the chest bone (sternum) which is branched and elongated in African species but shorter and spade-shaped in Asian ones (Gaubert 2011). Such morphological differences can be diagnostic and aid in identifying whether pangolins originated from Africa or Asia, an important point since most illegal trade in pangolins involves only their scales. Although scales between African and Asian species vary in shape, scales can either become naturally worn over time or are intentionally crushed prior

to export for commercial purposes. Therefore, genetic analyses are also necessary for definitive identification (Hsieh *et al.* 2011). Such lab analyses require time to complete and are less useful to customs officials who must often make rapid assessments of trafficked wildlife.

10. Consultations

On 8th April 2016, India sent a range States consultation letter by email to all other *Manis crassicaudata* range States (Bangladesh, China, Nepal, Pakistan and Sri Lanka). India received telephone and email communications from Bangladesh, Nepal, and Sri Lanka indicating their support for the proposal. Viet Nam has also indicated its support for the proposal via email. In addition, India has discussed the issue in the Pangolin Working Group in at the 66th Standing Committee meeting of CITES with USA, Bangladesh, Nepal, Pakistan, China and Sri Lanka. Finally, the First Pangolin Range States meeting, held in Viet Nam on 24-26 June 2015, which was attended by delegates from 29 African and Asian pangolin range States, discussed the issue and recommended the listing of all pangolin species on CITES Appendix I. With support from Wildlife Trust of India, Wildlife Conservation Society, Wildlife Protection Society of India (WPSI) and Humane Society International.”

11. Additional remarks

Nil

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