CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

Other proposals

A. Proposal

Transfer of *Manis crassicaudata*, *M. pentadactyla*, *M. javanica* from Appendix II to Appendix I.

B. Proponents

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

C. Supporting Statement

1. Taxonomy

1.1	Class:	Mammalia
1.2	Order:	Pholidota
1.3	Family:	Manidae
1.4	Genus:	*Manis crassicaudata* Gray, 1827 *Manis javanica* Desmarest, 1822 *Manis pentadactyla* Linneaus, 1758
1.5	Scientific synonyms:	
1.6	Common names:	English: (*Manis crassicaudata*) - Indian pangolin (*Manis javanica*) - Malayan pangolin (*Manis pentadactyla*) - Chinese pangolin French: (*Manis crassicaudata*) - Grand pangolin de l'Inde (*Manis javanica*) - Pangolin malais (*Manis pentadactyla*) - Pangolin de Chino Spanish: (*Manis crassicaudata*) - Pangolín indio (*Manis javanica*) - Pangolín malayo (*Manis pentadactyla*) - Pangolín Chino
1.7	Code numbers:	*Manis crassicaudata*: A-108.001.001.001 *Manis javanica*: A-108.001.001.003 *Manis pentadactyla*: A-108.001.001.005

2. Biological Parameters

2.1 Distribution

Manis crassicaudata occurs in the Indian sub-continent from eastern Pakistan, through much of India (south of the Himalayas), Bangladesh, and Sri Lanka, and, possibly, Myanmar and extreme western China (IUCN 1996, WCMC *et al.* 1999). Additional details on the distribution of this species are provided in Appendix A.

Manis javanica occurs in tropical Southeast Asia. Although the northern and western limits of its range are very poorly defined, it has been recorded in much of Indonesia, Malaysia, the Philippines (Palawan Province), the southern half of Indo-China, much of Thailand and southern Myanmar (Nowak 1991, WCMC *et al.* 1999). It may also occur in Bangladesh and southwest

China, although its occurrence in both these countries remains highly conjectural (WCMC *et al.* 1999). Additional details on the distribution of *M. javanica* are provided in Appendix A.

Manis pentadactyla occurs in the Himalayan foothills in Nepal, Bhutan and northern India, possibly Bangladesh, across Myanmar to northern Indo-China, and through southern China (south of the Chiangjiang) to Hainan and Taiwan (IUCN 1996; WCMC *et al.* 1999). The limits of its range are also poorly defined (WCMC *et al.* 1999). Additional details on the distribution of this species are provided in Appendix A.

2.2 Habitat availability

Pangolins, specialist feeders on ants and termites (Prater 1971; Roberts 1977; Tikader 1983; Heath and Vanderlip 1988), occupy forests, thick brush, and open or savannah country, and are largely solitary and nocturnal (Roberts 1977; Boonsong Lekagul and McNeely 1977; Davies and Payne 1982; Foenander 1953; Medway 1969; Medway 1977; Heath and Vanderlip 1988). Although data are limited, all Asian pangolins appear to be affected by loss of habitat due to expanding agriculture and other human uses. (see section 2.4 and 2.7).

M. crassicaudata occurs in forests, open land and grassland, and has been recorded near villages (Khan 1985, Zoological Survey of India 1994). This species excavates its own burrows, often under a large rock, and conceals the entrance of the burrow with loose earth, making detection difficult (Roberts 1977).

M. javanica occurs in a wide variety of habitats, including primary and secondary forest, and cleared and cultivated areas including gardens and rubber plantations (Boonsong Lekagul and McNeely 1977; Davies and Payne 1982; Foenander 1953; Medway 1969; Medway 1977; Zon 1977; Ban and Humphrey 1982). Although it is more often recorded in cultivated areas than forest, it is not clear whether *M. javanica* is more abundant in the former, or simply more often seen (Davies and Payne 1982).

M. pentadactyla is largely terrestrial, though is fully capable of climbing trees and, like other pangolins, swims well (Chao Jung-Tai 1989; Heath and Vanderlip 1988). The species is found in a range of different habitats, including primary and secondary forests and grasslands (Chao Jung-Tai 1989; Gurung 1996). This species digs its own burrows, or enlarges passages made by termites (Allen and Coolidge 1940; Fang and Wang 1980 cited in Heath and Vanderlip 1988). Indications are that home ranges for this species are relatively large, although concrete data are lacking (Heath and Vanderlip 1988). Allen and Coolidge (1940) noted that in China there appears to be a close correlation between the distribution of two termite species (*Coptotermes formosanus* and *Termes* (*Cyclotermes*) *formosanus*) and that of *M. pentadactyla*; it is assumed that these form a major component of the pangolin's diet.

2.3 Population status

Virtually no information is available on population levels of any of the Asian pangolins. Being highly secretive, solitary, and nocturnal, they are rarely observed, and are certainly not seen regularly enough to allow assessment of population densities (WCMC *et al.* 1999).

Manis crassicaudata is classified as “lower risk (near threatened)” throughout its range by the IUCN (1996). Khan (1985) stated that *M. crassicaudata* occurs in small numbers in Bangladesh, where this species was described as rare in 1986 (Bangladesh CITES MA *in litt.* 1986). In India, Tikader (1983) noted the overall status of *M. crassicaudata* as indeterminate. This species is relatively uncommon in Pakistan (Roberts 1977). It is reportedly of variable abundance in Sri Lanka, but nowhere common (Phillips 1981).

Manis javanica is rarely observed, and no population estimates have been located (WCMC *et al.* 1999). It is classified as “lower risk (near threatened)” throughout its range by IUCN (1996) and was reviewed in detail under the CITES Significant Trade process in 1992 (WCMC and IUCN/SSC (1992)) (see Section 4.1.2). Zon (1977) reported that *M. javanica* is common in Indonesia. Duckworth *et al.* (1999) noted that, although reported to be widespread by hunters, numbers of *M. javanica* in Lao PDR seem low; in no areas are field sightings common, nor are

tracks found particularly frequently. Duckworth *et al.* (1999) considered *M. javanica* to be "At Risk" in Lao PDR (the highest national category of threat). Medway (1977) stated that *M. javanica* is not uncommon throughout the mainland of west Malaysia. There is no recent data on the status of this species in Myanmar (WCMC *et al.* 1999). Doggett (*in litt.* 1981) documented the presence of very small numbers *M. javanica* in the wild in Singapore. *M. javanica* is considered threatened and becoming increasingly rare in Thailand (Bain and Humphrey 1982).

Very little information is available on the status of *M. pentadactyla* anywhere in its range (WCMC *et al.* 1999). It is classified by IUCN (1996) as "lower risk (near threatened)" throughout its range and was reviewed in detail under the CITES Significant Trade process in 1992 (WCMC and IUCN/SSC 1992) (see Section 4.1.2). Tikader (1983) accorded *M. pentadactyla* indeterminate status in India. This species was reported in the 1980s as common in the undisturbed hill forests of Arunachal Pradesh (Zoological Survey of India 1994). Duckworth *et al.* (1999) noted that pangolin populations, in general, have been so reduced in Lao PDR that field sightings are exceptionally rare. The only recent field sightings (during 1994-1995) was of an individual in Nam Theun Extension PNBCA (Proposed National Biodiveristy Conservation Area) and one seen in a village in Nakai-Nam Theun NBCA during the same period. In 1997, animals collected by villagers were seen around Nam Phoun NBCA (Duckworth *et al*. 1999). *Mantis pentadactyla* is less often recorded in trade in Lao PDR than *M. javanica*. WCMC *et al.* (1999) suggested that this fact reflects its lower abundance in the wild, relative to *M. javanica*. Duckworth *et al.* (1999) classified *M. pentadactyla* as "At Risk" in Lao PDR.

2.4 Population trends

Although very little is known about the reproductive success of Asian pangolins, there is evidence that it is very low. Female *M. crassicaudata* usually give birth to one young, although twins are apparently not unknown (Prater 1971). Inference from other species indicates that one *M. javanica* young is born at a time, after a gestation period of at least 130 days (WCMC *et al.* 1999). In addition, little is known of *M. pentadactyla* breeding habits, although in China and Taiwan, young (normally one, occasionally two) are reportedly born in spring (Allen and Coolidge 1940; Chao Jung-Tai 1989). Due to these facts, it appears that any external factors, such as hunting or forestry activities, could have negative impacts on the species.

Tikader (1983) stated that both the populations of *M. crassicaudata* and *M. pentadactyla* have been greatly reduced by hunting in India. Reports from the late 1980s and early 1990s suggest that the population of *M. pentadactyla* in Taiwan was decreasing due to poaching and habitat destruction (Chao Jung-Tai 1989; Taiwan Forestry Research Institute *in litt.* 1992). A 1993 survey conducted in the Royal Nagarjung Forest in Kathmandu, Nepal, determined that the protected *M. pentadactyla* population residing within the forest was fairly healthy, yet the general trend elsewhere in Nepal was dramatically declining, due to increased access to hunting areas and loss of habitat. At the same time, it was noted that there was an increase in conflict between armed wildlife and forestry guards and local hunters, seeking to utilize the resource (Gurung 1996). Duckworth *et al.* (1999) noted that, in three separate areas within the range of *M. javanica* in Lao PDR (Xe Pian, Dong Phou Veng and Khammouan Limestone NBCA), villagers have recently reported that pangolin populations have declined, in some areas to as little as one percent of the level 30 years ago. Duckworth *et al.* (1999) further noted that hunting in Lao PDR in general has significantly reduced pangolin populations. Duckworth (*in litt.*1999) stated that villager estimates of remaining pangolins in Lao PDR are of the order of 1-5% of levels 20 years ago.

2.5 Geographic trends

Khan (1985) stated that *M. crassicaudata* has possibly disappeared from Kushtia, Jessore, Pabna, Bogra, Rangpur, Dinajpur, Rajshahi, and most parts of Dhaka and Comilla in Bangladesh.

2.6 Role of the species in its ecosystem

Pangolins may play an important role in the ecosystem by providing pest control. Estimates indicate that one adult pangolin can consume more than 70 million insects annually (d'Aulaire and d'Aulaire 1983).

2.7 Threats

Threats to Asian pangolins include rapid loss and deterioration of available habitat and hunting for local use and for international trade in skins, scales, and meat.

Evidence suggests that pangolins, in general, are able to adapt to modified habitats (e.g., secondary forests), provided their termite food source remains abundant and they are not unduly persecuted (Prater 1971; Zoological Survey of India 1994). However, habitat destruction is indicated as a factor affecting the status of *M. javanica* and *M. pentadactyla* in Nepal (Gurung 1996), Taiwan (Chao Jung-Tai 1989; Taiwan Forestry Research Institute *in litt.* 1992), and Malaysia (WCMC *et al.* 1999). The encroachment of large human settlements into the preferred habitat of *M. pentadactyla* in Nepal is believed to be a contributing factor in the decline of this species (Gurung 1996). *M. pentadactyla* is reported to be under pressure from habitat destruction, especially by insecticide spraying, in Taiwan (Chao Jung-Tai 1989; Taiwan Forestry Research Institute *in litt.* 1992). According to WCMC *et al.* (1999), habitat loss, particularly the opening of new areas to oil palm monoculture, is reportedly one of the main threats to *M. javanica* in west Malaysia. Road kills are also apparently common (WCMC *et al.* 1999).

The Asian pangolins are also intensively used for their skins, scales, and meat, and are evidently subject to heavy collection pressure in many parts of their ranges (WCMC *et al.* 1999) (see Section 3 – Utilization and Trade). WCMC *et al.* (1999) suggested that this is the principal factor affecting these species. Hunting is identified as having a negative impact on *Manis* species in China (Fellowes and Hau 1997), Nepal (Gurung 1996), India (Tikader 1983), Lao PDR (Duckworth *et al.* 1999), and Taiwan (Chao Jung-Tai 1989; Taiwan Forestry Research Institute *in litt.* 1992).

3. Utilization and Trade

Most observations on the use of pangolins in Asia do not distinguish reliably between the three Asian species of pangolin. Because several countries (most significantly Lao PDR, Myanmar, and Viet Nam) have populations of both species that most commonly occur in trade (*M. javanica* and *M. pentadactyla*), and because China evidently imports both species, it is often impossible to determine which species is referred to in both local use and export (WCMC *et al.* 1999).

Because accurate, range-wide population and harvest data are not available, it is difficult to assess the impact of harvest on these species. Indications, from national use and international trade summarized below, are that, at a minimum, several tens of thousands of animals have been harvested and traded annually during the 1990s (WCMC *et al.* 1999). Figures, discussed in detail in Broad *et al.* (1988) and WCMC and IUCN/SSC (1992), indicate that trade of this magnitude also took place at least up until the mid-1980s (e.g. over 185,000 skins reported in international trade by CITES in the period 1980-85 alone). In addition, Harrison and Loh (1965) estimate that in the late 1950s and early 1960s, scales of some 10,000 pangolins (*M. javanica*) per year were exported from Borneo.

3.1 National utilization

Throughout Asia, pangolin meat is highly favored as a local source of protein. Pangolin skins are used to manufacture leather goods such as boots and shoes. Scales are used whole, or in powdered form, in preparing traditional medicines.

In Bangladesh, pangolins (almost certainly *M. crassicaudata*, although conceivably also *M. pentadactyla*) are regularly collected in hill forest areas for the scales and as a source of meat (Bangladesh CITES MA *in litt*. 1986). Khan (1985) stated that *M. crassicaudata* has possibly disappeared in many parts of Bangladesh due, in a large part, to hunting.

Throughout India, pangolin parts are used for traditional medicine (Mitra 1998). Groombridge (*in litt*. 1999) noted that the Kadars of the Anaimalai Hills in Kerala, southern India, regard *M. crassicaudata* as a favorite food, although they catch them infrequently. Local trade in *M. crassicaudata* scales and meat is occurring in West Bengal and Orissa (Mitra 1998), the Kanyakumari district (Mohan *in litt*. 1999), Manipur, Mizoram, and Tripura (TRAFFIC India *in litt.*1998). Tikader (1983) stated that both the populations of *M. crassicaudata* and *M. pentadactyla* have been greatly reduced by hunting in India. In 1998, retail prices of Rs 4-5 (around USD 0.12) per scale were quoted (Mitra 1998). Information from TRAFFIC India (*in litt*. to TRAFFIC International, March 1999) indicates that *M. pentadactyla* is collected for meat and scales in various parts of Manipur, Nagaland, and Assam. In 1999, it was estimated that around 25-45 kg of scales were collected monthly in Manipur; of this around 80% was believed smuggled into Myanmar, the remainder apparently being used locally. Individual agents collected 1-3 kg at a time, taking this to one of three main markets (Imphal and Moreh in Manipur and Dimapur in Nagaland) for sale. A whole animal, including meat, was reportedly worth Rs 2000-3000 (around USD 50-70). It was estimated that 3-4 animals were needed to produce 1 kg of scales (TRAFFIC India *in litt*. 1999). This figure differs considerably from that quoted by Harrison and Loh (1965) for the similarly sized *M. javanica* on Borneo, which they considered produced some 1.5 kg of scales per animal. Using the former figure, 25-45 kg of scales per month translates very roughly to some 1000-2000 pangolins collected annually in Manipur; using the latter, the numbers of pangolins would be ca. 200-350 (*WCMC et al*. 1999).

In Pakistan, hakims (practitioners of traditional medicine) consider various parts of the body of pangolins to be a valuable source of medicines (Roberts 1977).

Martin and Phipps (1996) noted that *M. javanica* is obtained from most parts of Cambodia. Dried pangolins and their claws were observed for sale at O Russei market in the early 1990s and stuffed pangolins were seen on sale at souvenir shops. Live pangolin reportedly cost R5000 (USD 2) per kg at the time and pangolin meat; scales and blood were on sale in at least one restaurant.

In Indonesia, *M. javanica* is reportedly hunted for food by rural communities in inland areas of East Kalimantan (Caldecott and Nyaoi 1985; Caldecott 1988, in MacKinnon *et al*. 1995); the scales are reportedly traded for cash. Pangolin meat and live specimens can be found on sale in Jakarta, Java, and Medan, North Sumatra, and in rural markets in North Sumatra. In and around Medan, live specimens reportedly sell for USD 2.50-12.00 each (TRAFFIC Southeast Asia *in litt*. 1999). In July and August 1996, prices in East Java for live pangolins were reported to be 78,000IDR (about USD 30 at the exchange rate of about 2600 to the dollar before the economic crisis) at market price, 5,000IDR (USD 1.90) for first level-middlemen price and 2,000IDR (USD 0.80) at source from the hunter (Theile *et al*.,in prep). *M. javanica* parts are commonly sold in Traditional Chinese Medicine shops in the city of Medan (TRAFFIC Southeast Asia, *in litt*. 1999).

Pangolins (both M*. javanica* and *M. pentadactyla*) are eaten in rural Lao PDR, and are widely available in urban food markets and restaurants. The overall domestic use is believed relatively low, although not entirely insignificant, compared with collection for export (Duckworth *in litt*. 1999).

In Malaysia, pangolin scales are believed to cure asthma (Che Ismail 1989). In Sabah and Sarawak, the pangolin is hunted for food (Caldecott and Nyaoi 1985) and the scales are reportedly used as a protection against witchcraft (Hoi-Sen 1977). Although the species is rarely seen for sale, pangolins are caught, whenever possible, for local consumption as food and medicine (Dr. Dionysius Sharma, WWF-Malaysia, TRAFFIC Southeast Asia *in litt*. 1999). Pangolins are reportedly also popularly used in Myanmar in traditional medicines (U Tin Than, WWF Thailand *in litt*. 1999).

In Viet Nam, pangolins (primarily the more common *M. javanica* rather than the rarer *M. pentadactyla*) are reportedly the most abundant species in trade. The scales, in particular, are used in traditional Vietnamese medicine (J. Compton, *in litt*. 1999).

In China, pangolin scales are highly valued for their alleged medicinal value, particularly for treating a wide variety of skin diseases (Harrisson and Loh 1965). From available data, it is impossible to estimate total pangolin scale use in China. However, surveys conducted between May and June of 1996 by the Chinese Academy of Science in six Chinese medicine markets showed that pangolin scales were among the most frequently observed Chinese *materia medica* (Guo *et al*. 1997). As an indication of the magnitude of use, one traditional Chinese medicine company alone reported buying 70 metric tons (mt) of pangolin scales in the period 1990-1993 (including over 42 mt in 1990 alone) (Guo *et al*. 1997). In 1991 alone, imports of just under 63 mt of pangolin scales were recorded (Song 1996).

Previous extensive use of pangolins in Taiwan, both native and imported, was discussed in detail in WCMC and IUCN/SSC (1992).

Most, if not all, use of native pangolins in Thailand is likely to involve *M. javanica*, since *M. pentadactyla* occurs only marginally in Thailand. Indications are that pangolins are also imported from Myanmar into Thailand (U Tin Than, WWF Thailand *in litt*. 1999).

3.2 Legal international trade

International trade in pangolin products recorded by CITES generally involves skin and scales, although there is also evidence of considerable cross-border trade in pangolins for meat in East and Southeast Asia (WCMC *et al.* 1999). Scales are used for medicinal purposes, while skins are used for the manufacture of leather goods, principally boots (WCMC *et al*. 1999).

No trade in *M. crassicaudata* has been reported by CITES Parties in the period 1984-1996, nor has any trade in *Manis* spp., specified or otherwise, been reported by any of the four definite range states of *M. crassicaudata* since 1991. A minimum of just over 5700 skins of *M. crassicaudata* was reported in trade in the period 1980-1983 (WCMC *et al*. 1999). However, the great majority of these had reported origin in countries outside the range of *M. crassicaudata* and it is possible that they were misidentified or misdeclared skins of other Asian *Manis* species (Broad *et al*. 1988).

Trade up to 1991 in *M. javanica*, particularly that recorded in CITES annual reports, is discussed in detail in Broad *et al*. (1988) and WCMC and IUCN/SSC (1992). As noted in WCMC and IUCN/SSC (1992), the vast majority of CITES-reported trade is in leather or leather products and other parts and derivatives (much of it classified as scales, but the unidentified portion is almost certainly also scales). Trade in live animals or bodies recorded by CITES is negligible by comparison (and by comparison with cross-border trade in Southeast and East Asia). The range states for which substantial exports (over 1000 skins or kg of skins or scales declared in total for the period 1991-1996) were recorded in CITES annual reports are: Indonesia; Lao PDR; Malaysia; Singapore; and Thailand. Overall, some 80,000 skins (plus a few thousand kg of skins) were recorded in CITES annual reports as exported by range states in the years 1991-1996, the vast majority from Lao PDR. In addition, Malaysia recorded exporting some 7500kg of scales. Using the figure in Harrison and Loh (1965) of 1.5 kg of scales per pangolin, which is probably generous, this would account for some 5000 animals (WCMC *et al*. 1999).

Manis pentadactyla is highly exploited, as evidenced by the recent high level of trade in scales and other derivatives for traditional medicine purposes. Virtually all trade in *M. pentadactyla* recorded in CITES annual reports for the period 1991-1996 took place in 1991 and 1992. The vast majority was in derivatives from China exported to a wide range of countries. Units were given in cartons or boxes or were unspecified. It is impossible to estimate quantities involved in any meaningful way, particularly as the largest number involved is 30,000 derivatives of unspecified unit (exported from China to Hong Kong in 1992). In addition, there has been a small trade in live animals (16 in total), bodies (7) and shoes (245) and somewhat more trade in skins. The latter were all imported by Mexico, which in 1991, reported import of 5000 skins from the Republic of Korea and 1000 kg of skins from Hong Kong, both with a declared origin of Indonesia (where *M. pentadactyla* is not native but *M. javanica* is). In 1992, Mexico reported importing 5000 skins, plus an additional 1000 kg of skins, from Viet Nam. Fifty skins imported into the United States were declared to have originated in Indonesia (WCMC *et al*. 1999).

WCMC *et al.* (1999) provides the following assessment with respect to international trade in *M. javanica* and *M. pentadactyla* (this information is also summarized in Appendix B):

– Mexico (a major leather-processing nation (WCMC and IUCN/SSC 1992)) recorded importing 10,000 skins of *M. javanica* from Indonesia in 1991. No subsequent exports have been recorded from Indonesia, and it has not authorized export quotas since 1995.

– In 1992, the United States imported just under 1300 skins, originating from Thailand, from Mexico. In 1995, the United States reported imports of 300 skins from Thailand and a further 266 skins from Thailand with a reported origin of Lao PDR. In 1996, over 8000 skins imported from Lao PDR was reported. According to CITES annual reports, Mexico and the United States are the major importers of pangolin leather, accounting for the vast majority of that recorded in trade. Recorded imports to other countries are negligible by comparison.

– Between 1991 and 1996, Lao PDR (not a Party to CITES, so all CITES information is derived from reports from importing countries) exported over 68,000 skins, some 1600 kg of skins, and nearly 1000 square meters of skin of *M. javanica*, the great majority of which went to the United States and Mexico. As noted above, there is intensive harvesting of pangolins in Lao PDR, although most are now believed destined for Viet Nam and, speculatively, thence to China (Duckworth *in litt*. 1999).

– Malaysia had recorded exports of 2000 kg of *M. javanica* scales in 1994, 5500 kg of scales in 1996, and 2500 kg of skins in 1996, all to Singapore. With the exception of the 1994 scales, which were reported both by Singapore and Malaysia, this trade was only recorded by Singapore (WCMC *et al*. 1999).

– Singapore reported exports of 370 skins and 6000 kg of scales of *M. javanica* in 1994 and 1996 to Mexico and Japan (1994) and China (1996). Although Singapore reported exporting skins and scales, during the same time period it imported a greater number of each (590 skins from Viet Nam, 2500 kg of skins from Malaysia, and 7500 kg of scales from Malaysia).

– Viet Nam recorded exports of 590 *M. javanica* skins between 1991 - 1996.

– The Korean Pharmaceutical Traders Association (KPTA) (1993-1998), whose data are believed to be more complete than those of the Korean Customs Service (TRAFFIC Southeast Asia, *in litt*. 1999), indicates imports of some 55 mt of pangolin scales (unspecified species) in 1993 and 2 mt in 1994. Of the 1993 imports, 28 mt were from China, 15.5 mt from Viet Nam and 10.6 mt from Indonesia. The 1994 imports were from Viet Nam. Both *M. javanica* and *M. pentadactyla* are present in Viet Nam, while only the former is present in Indonesia and probably only the latter in China (which does, however, evidently import a very large proportion of its pangolin product from countries where both species are present). Using the figure in Harrison and Loh (1965) of 1.5 kg of scales per pangolin (for *M. javanica* in Borneo), the total import of 57 mt would represent just under 40,000 animals. Using the figure of 3-4 pangolins per kg of scale provided by TRAFFIC India (*in litt*. 1999) for *M. pentadactyla* in northeast India, the number of animals would be 200,000 to 280,000. No imports have been recorded either by the KPTA or the Customs Service since 1994 (TRAFFIC Southeast Asia, *in litt*. 1999). Korea became a Party to CITES in 1993, but did not report 1993 or 1994 imports. The exports from China and Indonesia were unrecorded in these countries' respective annual reports, despite both being Parties to CITES at the time.

– China has a very high demand for pangolin products, from both *M. javanica* and *M. pentadactyla*. Information from the State Administration of Traditional Chinese Medicine (SATCM) (1996) indicates that, at least since the early 1990s, the supply of pangolin products has been largely from imported animals or their parts. Observations from Viet Nam and from Guangxi Province (Li *et al*. 1996), indicate that very large numbers are traded across the Sino-Vietnamese border. There is no sign of these in CITES annual report statistics. Chinese Customs statistics do not have a specific category for recording imports of pangolins, their parts, or derivatives. Incomplete data in Song (1996) indicate imports of 14.7 mt of pangolin

scales in 1990, 62.8 mt in 1991, and 17.8 mt in 1995. Due to these incomplete records, it is very difficult to distinguish between locally collected pangolins and imported pangolins.

The maintenance of trade of this magnitude over several decades might seem to imply that the harvest is sustainable. However, evidence suggests that the origin of the animals in trade has shifted as populations have become depleted, and also as protective measures have been imposed in various parts of the species' range (WCMC *et al*. 1999). CITES data indicate that until the mid-1980s, most imports were declared as originating in Thailand, Indonesia, or Malaysia (Broad *et al*.1988; WCMC and IUCN/SSC 1992), and therefore were primarily *M. javanica*. It now seems that most recorded trade originates in Lao PDR, and is comprised of both *M. javanica* and *M. pentadactyla* (though primarily the former)(WCMC *et al*. 1999). Thailand, Indonesia, and Malaysia have all now classified pangolins as protected species, implying concern about their status in these countries, and have stopped exports (WCMC *et al*. 1999). Both species occurring in Lao PDR are now included in a provisional list of the most threatened animal species in the country (Duckworth *et al*. 1999). Price information, both in consuming countries (e.g. China and Republic of Korea) and, even more significantly, in areas where pangolins are harvested (northeast India, Lao PDR, Myanmar), indicates that pangolins are now a very valuable commodity. In both northeast India and Myanmar, a single live pangolin is reported to be worth at least USD 50, a significant incentive for collection from the wild relative to average rural incomes in range nations (WCMC *et al*. 1999).

3.3 Illegal trade

Observations in mainland Southeast Asia indicate that there is a large amount of unrecorded, presumably illegal, cross-border trade in pangolins and pangolin products (WCMC *et al.* 1999).

Compton and Le Hai Quang (1998) estimate that, conservatively, at least 400 pangolins are smuggled from Viet Nam to China by land border crossings each week. They are typically seen in cargoes of 50-100 animals. The species involved have not been identified (*Compton in litt*. 1999), but are presumably comprised of *M. javanica* and *M. pentadactyla*. Vietnamese middlemen, in 1997-98, reportedly bought pangolins for around VND 250,000 (USD 19) per kg and sold them to Chinese buyers across the border for VND 400,000 (USD 31) per kg. However, information collected in the Tay Nguyen plateau in Vietnam's central highlands in January 1999 revealed that the price paid by middlemen was as high as VND 450,000 (USD 35) per kg (J. Compton, WWF Indochina *in litt.* 1999). Li and Li (1997) also report that 600-800 pangolins were imported into China at a single port on this border on 27 July 1994. If these figures are reliable, this trade dwarfs that recorded in CITES annual reports (WCMC *et al.* 1999).

There is reportedly cross-border trade in pangolins (presumably both *M. pentadactyla* and *M. javanica*) from Myanmar into Thailand and China (WCMC *et al.* 1999). Trade to the latter is substantiated by records of seizures of small numbers of pangolins and small amounts of scales on the Chinese side of the Sino-Burmese border in 1994-1995 (Wang and Li 1998).

Duckworth *et al*. (1999) note that pangolins are the most heavily traded animal in Lao PDR, with *M. javanica* outnumbering *M. pentadactyla*. They speculate that pangolin scales may generate the largest trade in any single wildlife product in the country. In a period of 4-5 months in 1998, over 100 pangolins (total weight 200-300 kg) were reportedly taken from one village in Dong Khanthung PNCBA alone. Indications from seizures (e.g. over 200 kg seized in three days in late 1997 in and around Ban Lak and 570 kg confiscated in two months in 1998 in Khamekeut District, Bolikhamxai Province) are that these figures are by no means exceptional (Duckworth *et al*. 1999). Incentives to collect pangolins are clearly extremely high. One villager is said to have realized over a million kip (USD 500) in the 1997/1998 dry season. Major seizures of pangolins are all believed destined for export, primarily to Viet Nam and, speculatively, thence to China (Duckworth *in litt*. 1999).

In Myanmar, live pangolins and scales are brought to Yangon (Rangoon) and Mandalay where they are said to be exported to the Chinese border city of Shwelii through the Myanmar border town of Musae. There is also reportedly trade into Thailand through the border town of Tachilek. Pangolins

are sold for around USD 50 each in Yangon and around USD 65 in Musae. Trade is likely to be in both *M. javanica* and *M. pentadactyla* (U Tin Than, WWF Thailand *in litt*. 1999).

In China, demand for pangolin scales is sufficiently high to lead to periodic shortages and major increases in prices (Anon. 1995, in Guo 1997). From 1984 to 1988, the market price reportedly increased 14-17 fold. By the early 1990s, there was apparently a dire shortage of locally available scales (i.e., presumably *M. pentadactyla*) which was alleviated by supplies from neighboring countries (Lao PDR, Myanmar, Viet Nam). It seems that availability of these gradually decreased until 1995 when supplies collapsed leading to a dramatic increase in price (from RMB 280-300 (USD 34-36) per kg in the first half of 1995 on the Guangxi border to RMB 650 (USD 80) in March 1996) (SATCM 1996). (Note that it is unclear whether these are retail or wholesale prices). Wholesale prices in China during 1998 averaged RMB 371 (USD 45) per kg (SATCM 1998a). The Chinese *Materia Medica* Company Information Centre noted in both 1996 (SATCM 1996) and 1998 (SATCM 1998b) that there was a severe shortage of pangolin scales in China. Medicine companies have posted offers for the purchase of substantial quantities (several hundred kg) of scales, further indicating that they are in short supply (SATCM 1998c and d).

A survey in December 1993 of restaurants in the middle/high price range along the Sino-Vietnamese border and in Nanning city (Guangxi Province) found that some two-thirds of them offered pangolin (Li *et al.* 1996). In 1994, prices for live pangolins along the Sino-Vietnamese border were around USD 10-15 per kg, rising to USD 15-25 per kg in Guangzhou and Nanning and some USD 3-4 more than this in Guangdong (compared to prices of USD 1.5-2.5 for beef and pork). In 1997-98, Chinese buyers were reportedly buying pangolins from Vietnamese middlemen for USD 31 per kg (J. Compton, WWF Indochina, *in litt*. 1999).

There is no centralized database for the collection of pangolin seizure data in China. Thus not all seizure data are available, and those that have been obtained do not reflect the actual level of pangolins in illegal trade through China (WCMC *et al*. 1999). Analysis of the Guangxi wildlife authorities' seizure data by Li *et al*. (1996) shows that in Guangxi Province, pangolins were among the most frequently confiscated species. From January to October 1991, Guangxi wildlife authorities confiscated around 2700 pangolins (mostly *M. pentadactyla*). Official documentation (1990-1994) maintained by the local forestry bureau in Guangxi and Guangdong and analyzed by Li *et al*. (1996) revealed that confiscation of wildlife, including pangolins, decreased each year. This is believed more likely to reflect the decline of natural populations, or the effort of trade control by local wildlife authorities, rather than a decline in demand, as prices for these species reportedly continued to increase (Li *et al*. 1996). Wang and Li (1998) record the confiscation at the Sino-Burmese border during 1994 and 1995 of small numbers of pangolins (14) and small amounts of pangolin scale (35 kg) apparently originating in Myanmar. Small quantities of *M. pentadactyla* and *M. javanica* have been seized in Hong Kong during the period 1991-1998 (Agriculture and Fisheries Department of the Hong Kong SAR Government, *in litt*. 1999).

Although the vast majority of illegal trade appears to involve *M. pentadactyla* and *M. javanica*, there were also reports of exports of scales, presumably *M. crassicaudata*, from India to Nepal through Shimapur in Nagaland. Since no CITES Parties reported trade in this species in the period 1984-1996, it could be presumed that this trade is illegal. Prices paid by the agents were reportedly in the range Rs 250-500 (ca. USD 6-12) per kg of skin (presumably with scales), and rising to Rs 500-1000 (ca. USD 12-24) at sale points in Imphal and Dimapur.

3.4 Actual or potential trade impacts

Evidence from African pangolins suggests that pangolins have very large home ranges (in the case of *M. temminckii*, several hundred hectares) and a relatively low reproductive rate (one or, rarely, two young per female per year). It may be inferred, therefore, that collection of Asian pangolins may present a significant threat to these species (WCMC *et al*. 1999). Their secretive and nocturnal habits may well prevent them ever being completely collected out from more inaccessible areas, but evidence regarding *M. javanica* from Lao PDR, for example, indicates that populations can be reduced to a very small fraction of their former size by overcollection (WCMC *et al.* 1999).

3.5 Captive breeding or artificial propagation for commercial purposes

Pangolins are difficult to maintain and are rarely kept in captivity (Wilson 1994), mainly due to their specialized diet (Roberts 1977). However, captive birth of *M. crassicaudata* (Ogilvie and Bridgewater 1967) and *M. pentadactyla* (Masui 1967) have been reported. Guo *et al*. (1997) report that 50 *M. pentadactyla* were kept on a farm in an unspecified province in China. However, information from the Chinese CITES Management Authority indicated that there are no registered captive breeding facilities for pangolins in China, and that reports of captive breeding of pangolins are likely to refer to individuals taken from the wild (TRAFFIC East Asia *in litt.* 1999). *Manis javanica* has reportedly been kept in captivity (Wilson 1994), though no records of successful captive breeding of the species have been located (WCMC *et al*. 1999).

4. Conservation and Management

4.1 Legal status

4.1.1 National

In Bangladesh, all pangolins are legally protected (Bangladesh CITES MA *in litt*. 1986). The legal status of pangolins in Lao PDR is unclear, as a result of internal contradictions in Laos laws applicable to wildlife and wildlife trading. However, Provincial and District Agricultural and Forestry Offices in Lao PDR have been confiscating large numbers of pangolins, so there is evidently a perceived legal basis for doing so (WCMC *et al*. 1999). In Thailand, all *Manis* species are classified as Protected Wild Animals under the 1992 Wild Animals Reservation and Protection Act B.E. 2535 (TRAFFIC Southeast Asia *in litt*. 1999). In Myanmar, in accordance with the Protection of Wildlife, Wild Plant and Conservation of Natural Areas Act 15(A), no pangolin may be caught in the wild, kept, sold or exported (WCMC *et al*. 1999). On Taiwan, all *Manis* spp. have been protected since August 1990 under the 1989 Wildlife Conservation Law. International and domestic trade, as well as hunting, are now prohibited (WCMC *et al*. 1999). In Thailand, all *Manis* spp. are classified as Protected Wild Animals under the 1992 Wild Animals Reservation and Protection Act B.E. 2535 (TRAFFIC Southeast Asia *in litt*. 1999).

In India, *M. crassicaudata* and *M. pentadactyla* are completely protected, since they are included in Schedule I of the Wildlife Protection Act 1972 (Gaski and Hemley 1991; WCMC *et al*. 1999). Chapter 15 of the Export and Import Policy, notified under Section 5 of the Foreign Trade (Development and Regulation) Act, 1992, prohibits the export of all forms of wildlife including their parts and products. In Pakistan, *M. crassicaudata* is completely protected under the Islamabad Wildlife (Protection, Preservation, Conservation, and Management) Ordinance, 1979 and the North-West Frontier Province Wildlife (Protection, Preservation, Conservation, and Management) Act, 1975 (WCMC *et al*. 1999). Hunting of *M. crassicaudata* is prohibited in Sri Lanka (Broad *et al*. 1988). Hunting of *M. crassicaudata* and *M. pentadactyla* is prohibited in Nepal (Gaski and Hemley 1991).

Manis javanica has been protected in Indonesia since 1931, under Wildlife Protection Ordinance No. 266 of 1931 (promulgated by the Dutch administration)(WCMC *et al*. 1999). This species is also protected under Act. No. 5 of 1990, regarding Conservation of Natural Resources and Their Ecosystems; Decree of the Minister of Forestry No. 301/kpts-II/1991 and Decree of the Minister of Forestry No. 822/kpts-II/1992 (WCMC *et al*. 1999). *Manis javanica* is completely protected in west Malaysia under the Protection of Wild Life Act, 1972; a protected species, banned from local trade, in Sarawak under the Wildlife Protection Ordinance 1998; and protected in Sabah under the Wildlife Conservation Bill, 1997 (TRAFFIC Southeast Asia *in litt*. 1999). In accordance with the Protection of Wildlife, Wild Plant and Conservation of Natural Areas Act 15(A), *M. javanica* is categorized as a Completely Protected Animal in Myanmar (WCMC *et al*. 1999). No pangolin may be caught in the wild, kept, sold, or exported (TRAFFIC Southeast Asia *in litt.* 1999). In the Philippines, *M. javanica* is protected under a blanket ban on the collection of any form of wildlife in the Province of Palawan, the entire

province having been declared a game refuge and bird sanctuary in 1969 (Proclamations 219 and 530-B) (Philippines CITES MA. *in litt*. 1986). In Singapore, the pangolin is protected under the Wild Animals and Birds Act (Domestic Law) 1904 and Endangered Species Act (Import/Export, CITES Law)(WCMC *et al*. 1999). The penalty for breaking this law is a fine of up to SD 1000.00 and the confiscation of the animal or product (WCMC and IUCN/SSC 1992). No specific legislative protection exists in Viet Nam for *M. javanica* (J. Compton, WWF Indochina, *in litt*. 1999).

Manis pentadactyla is listed as a Class II protected species in China's Wild Animal Protection Law (1989). Catching or hunting of wildlife under Class II protection requires a special licence. The sale and purchase of wildlife under special state protection or the products thereof is prohibited. As a CITES Appendix II-listed species, the export and import must be approved by the CITES Management Authority (CITES MA of PRC 1995a).

Manis pentadactyla is also listed as a Class II protected species in China in the Regulations on the Conservation and Management of Wild Resources of Medicinal Plants and Animals (1987). Class II protected species are classified as important medicinal species with a reduced habitat and depleted resources. Hunting, collection, and purchase of Class II protected species requires a permit issued by the Chinese medicine management authority, and the wild animal and plant management authorities. The hunting and collection of Class II protected species is not allowed in protected areas or during the seasons when it is forbidden to hunt/collect that species. Export of Class II protected species is allowed according to the export limit set by the authorized departments under the State Administration of Traditional Medicine and the State Council, and only with an export permit granted by the authorized departments of the State Administration of Traditional Medicine and the State Council (State Council, PRC 1987).

An official letter (No. 133) issued by the Ministry of Forestry (now State Forestry Administration) of China detailed the correct procedures for the export of medicines containing wild animals. Export of medicines containing wild animals must be carried out in accordance with the Wild Animal Protection Law (1989) and CITES. Export of medicines containing animal parts, including 31 listed medicines containing pangolin scales, are prohibited. Documentation issued by the CITES Management Authority must be submitted to customs for approval of export (CITES MA of PRC 1995b).

An official notice (No. 48) from the CITES Management Authority and Chief of Customs of China provided reference for the procedures for export of products made from wild animals. The import, export, and re-export of products, including *materia medica* and products thereof, including pangolin scales, require a CITES export permit or certificate required under the Wild Animal Protection Law (1989) before approval to import, export, and/or re-export may be granted by customs (CITES MA of PRC 1997).

4.1.2 International

The three Asian *Manis* species have been listed in Appendix II of CITES since January 7, 1975.

4.2 Species management

4.2.1 Population monitoring

As stated above, the secretive and solitary nature of pangolins makes monitoring wild populations difficult. A survey conducted in the Royal Nagarjung Forest in Kathmandu, Nepal in 1993, determined that the protected *M. pentadactyla* population residing within the forest was fairly healthy, yet considered the general trend elsewhere in Nepal to be one of dramatic decline, due to increased access to hunting areas and loss of habitat (Gurung 1996).

4.2.2 Habitat conservation

No information.

4.2.3 Management measures

No harvesting or trading management programs are currently in place in Lao PDR (WCMC *et al*. 1999). A number of measures are being formulated, and some are being undertaken. These include stepping up of border patrols; declaration of protected areas and initiation of management within them; recognition the major threats against pangolins and the need for higher priority in conservation activities; upgrading national wildlife laws; and public education and awareness (Duckworth, J.W. *in litt*. 1999).

In China, confiscated *M. javanica* may have been introduced into reserves where they may conceivably have a serious impact on the extant population of *M. pentadactyla* (Li *et al*. 1996), although indications from African species are that pangolins may be difficult to relocate, generally dying shortly after release (WCMC *et al.* 1999).

4.3 Control Measures

4.3.1 International trade

During the period 1991-1998, one seizure of pangolin scales (1176 kg originating in Hong Kong) was made in Taiwan (Council of Agriculture 1998). Between 1991 and 1996, some 100 *M. pentadactyla*, reportedly destined for human consumption, were seized in the Municipality of Macao. Countries of origin were China and Viet Nam (Marçal *in litt*. 1999). Indonesia issued no export quota for *M. javanica* for the period 1995-1998 (TRAFFIC Southeast Asia *in litt*. 1999).

4.3.2 Domestic measures

Two seizures of pangolin scales in India (West Bengal) have been reported for the period 1991-1996; these are likely to have been comprised of *M. crassicaudata*, the only species known to occur in West Bengal (WCMC *et al*. 1999). Provincial and District Agricultural and Forestry Offices in Lao PDR have been confiscating large numbers of pangolins, where *ad hoc* confiscation of sacks of pangolins (often mixed with freshwater turtles) is taking place (WCMC *et al*. 1999). Guo *et al*. (1997) noted that enforcement of both of the acts that protect pangolins in China appears to be lacking. Despite the fact that the 1987 Regulations are often displayed in the medicinal markets, species afforded protection by these regulations are still available and openly displayed in the markets. Lack of coordination between different departments concerned with enforcement of legislation and regulations is considered by the wild animal authorities as a major problem (Guo *et al*. 1997).

5. Information on Similar Species

All *Manis* spp. are listed in at least Appendix II, either under Article II(2)(a) or II(2)(b). All species are similar in appearance, but clear identification can be made through close inspection of whole animals or scales.

6. Other Comments

The range country governments of Bangladesh, Brunei Darussalem, Burma/Myanmar, Cambodia, China, Indonesia, Malaysia, Pakistan, the Philippines, Singapore, Thailand, and Vietnam were consulted in regard to the desirability of transferring Asian pangolins from Appendix II to I. Bangladesh, Brunei Darussalem, the Philippines support the proposed transfer. Indonesia stated "If uplisting into Appendix I would help the conservation of this species, we are not in the position to reject the proposal." China believes that further assessment is needed on whether or not to transfer Asian pangolins from Appendix II to I; they believe that more information is needed about the species

before any transfer is made. Malaysia and Singapore expressed no opinion on the proposed transfer. Other countries did not respond.

7. Additional Remarks

Manis crassicaudata - Although there is limited evidence of trade, either legal or illegal, in *M. crassicaudata,* there is very little known about its range, reproductive potential, or how well it adapts to human encroachment/threats. There is evidence that the species is being severely impacted by hunting in India and its status in Bangladesh, Pakistan, and Sri Lanka appears to be decreasing. Given the level of trade that appears to be occurring in other Asian pangolin species, it is reasonable to assume that as these species become rarer and more difficult to obtain, that trade would shift to *M. crassicaudata.* Therefore, *M. crassicaudata* meets the Biological Criteria for listing in Appendix I (Conf. 9.24, Annex 1 (D), with reasonable inference that it will met Conf. 9.24, Annex 1 (C) within five years if it is not transferred to Appendix I).

Manis pentadactyla - Although all range States appear to be working to control the illegal trade through domestic laws and law enforcement actions, as shown by the number of confiscations that have taken place, tighter control of the trade is needed. It is clear that given the level of trade, both legal and illegal, and the apparent decline in species numbers, *M. pentadactyla* is threatened with extinction under Conf. 9.24, Annex 1 (C).

Manis javanica – As with *M. pentadactyla*, the range States appear to be working to control the illegal trade through domestic laws and law enforcement actions, but tighter control of the trade is needed. Given the level of legal and illegal trade and the declining population numbers, *M. javanica* is threatened with extinction under Conf. 9.24, Annex 1 (C).

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Details on the Distribution of *Manis* spp. (Source: WCMC *et al.* 1999)

Manis crassicaudata

Khan (1985) stated that *M. crassicaudata* is widely distributed in Bangladesh, excluding the coastal parts of Khulna, Barisal, Pauakhali, Noakhali and Chittagong Districts.

Tikader (1983) reported *M. crassicaudata* as widely distributed through the plains and lower slopes of hills south of the Himalayas to the southern extremity of India. Recent records of occurance include Kerala and Kanyakumari; Tamil Naidu (Mohan *in litt*. 1999); Delhi (Singh 1994); Gwalior and Achanakur Wildlife Sanctuaries (Madhya Pradesh) (Saxena 1985); Bandipur, Bhadra, Dalma and Dandeli Wildlife Sanctuaries; Bandipur Tiger Reserve (Karnataka); Buxa Tiger Reserve (West Bengal); Catugao Wildlife Sanctuary (Goa); Chambal National Park (Madhya Pradesh); Gir National Park (Gujarat); Keolodeo Ghana Wildlife Sanctuary (Rajasthan); Kotgarh and Kuldiha Wildlife Sanctuaries and the Sunabedh Plateau (Orissa); Singalila Wildlife Sanctuary (West Bengal); Achanakuar Wildlife Sanctuary (Madhya Pradesh) (Mitra *in litt*. 1999); and the Himalayan foothills, Uttar Pradesh (TRAFFIC India *in litt*. 1999).

M. crassicaudata is apparently very locally distributed in Pakistan (Roberts 1977). It has been recorded in Sialkot, Jhelum and Gujrat Districts in the northwest of the Punjab, extending across the Salt Range into Kohat District, and from Campbellpur District up to Mardan and Peshawar in the North West Frontier Province. It was found in the Potwar Range and extended up to 750m elevation in the Rawalpindi foothills. Further south, it appeared to be absent from the Indus riverine plain, but did occur on the right bank of the Indus in the hilly regions in the western part of the Dadu and Larkana deserts (Baluchistan) and extended southward through Las Bela and Mekran. It also occurs east of the Indus in Hyderabad district and Tharparkar, extending eastwards to Kutch (Roberts 1977). The species was described in 1986 as rare (Pakistan CITES MA *in litt.* 1986).

In Sri Lanka, Phillips (1981) reports *M. crassicaudata* as locally distributed throughout the whole of the lowlands, ascending to around 3500 feet (1100m) in hill regions. Its range appears to coincide with that of the termites on which it feeds (WCMC *et al.* 1999).

Allen (1938) quoted nineteenth century sources which record *M. crassicaudata* as occurring in low country of Myanmar around Bhamo and outlying spurs of the Kakhyen Mountains in north-east Myanmar and the adjacent part of China, extreme western Yunnan. However, WCMC *et al.* (1999) noted that this occurrence appears to be considerably to the east of other records of this species. For example, *M. crassicaudata* is not mentioned as occurring in Myanmar by Salter (1983) or U Tun Yin (1967). WCMC *et al.* (1999) suggested that these records actually refer to *M. javanica*. Zhang (1997) included *M. crassicaudata* in a list of mammals in China, but cited Allen and Coolidge (1940) as the source (WCMC *et al.* 1999).

Manis javanica

According to Medway (1977), *M. javanica* is presumably present in Brunei.

Although no definite records have been located, *M. javanica* almost certainly occurs in Cambodia, being recorded from all adjacent countries (WCMC *et al.* 1999).

Zon (1977) noted the distribution of *M. javanica* in Indonesia to include Sumatra, Kiau and Lingga archipelago, Bangka and Belitung, Nias and Pagi islands, Kalimantan, Java, and Bali.

M. javanica is evidently widespread in Lao PDR (WCMC *et al.* 1999). Duckworth *et al.* (1999) noted that recent records are from a wide range of areas below around 600 m altitude, from Xe Pian National Biodiversity Conservation Area in the south at least as far north as Nam Kading. Its latitudinal range is thought likely to overlap considerably with that of *M. pentadactyla*, the latter generally occupying higher altitude areas. Duckworth (*in litt.* 1999) speculated that *M. javanica* in Lao PDR might be restricted to the Mekong plain and adjacent foothills to around 3000 feet (ca 900m) altitude, possibly also occurring on

the Bolaven Plateau. According to Deuve and Deuve (1963), *M. javanica* is found throughout the Mekong Valley, at least as far north as Luang-Prabang Province.

Medway (1977) stated that *M. javanica* is widespread throughout the mainland of west Malaysia, primarily in forest, but also in gardens and plantations, including rubber. It is also found on the island of Penang. This species is reportedly widespread on Borneo, from sea-level to an altitude of 1700m on Gunung Kinabalu in Sabah (Payne *et al.* 1985), although Proud (*in litt.* 1981) notes that it appears to be absent from the extensive peat swamp forests of Sarawak. In Sabah, Davies and Payne (1982) noted that the species is rarely seen, though evidently widely distributed, being known by local people throughout Sabah. In particular it is reliably reported to be present in the cultivated areas between Tawau and Merotai (to the southwest of the Tawau Hills national park) and sightings have been made in gardens in the Sandakan area and in Sepilok Nature Reserve (Davies and Payne 1982).

Salter (1983) noted that *M. javanica* is probably widespread in Myanmar. Corbett and Hill (1992) indicated that this species is distributed in southern Myanmar.

In the Philippines, *M. javanica* occurs on the main island of Palawan and on the islands of Busuanga and Culion in the Calamian Group in northern Palawan Province (Anon. 1979; Alvarez *in litt.* 1982).

According to Doggett (*in litt.*1981), *M. javanica* was still found in the wild in Singapore in the early 1980s.

M. javanica occurs throughout Thailand (Boonsong Lekagul and McNeely 1977; Bain and Humphrey 1982; WCMC *et al.* 1999).

Locality records exist for *M. javanica* from Kontum Province, Tay Ninh Province and Quang Nam Province in Viet Nam (Peenen *et. al.* 1969). Bourret (1942) noted that the species is often found in Cochinchina.

There are no definite records of *M. javanica* in China. However, a reference in Allen and Coolidge (1940), cited recently in Zhang (1997), to the presence of *M. crassicaudata* in the region of Bhamo and adjacent mountains in northeast Myanmar and extreme western Yunnan, may conceivably refer to this species (WCMC *et al.* 1999).

Khan (1985) noted that *M. javanica* could possibly occur in Bangladesh, although there are no specimens or sight records. Husain (1974) lists it for the country, but gives no details. Bangladesh lies well to the west and north of the species' confirmed range, so its occurrence here seems unlikely (WCMC *et al.* 1999).

Manis pentadactyla

Khan (1985) states that *M. pentadactyla* is possibly present in Bangladesh, although he notes that there are no sight records or specimens. If present, the most likely areas are the forests of Sylhet, Comilla, and Chittagong Hill Tracts districts.

M. pentadactyla may be expected to occur in Bhutan, since it is recorded in the adjacent countries of Nepal and India (Ellerman and Morrison-Scott 1951).

M. pentadactyla is described by Allen and Coolidge (1940) as being found throughout southeast China from the southern border as far north as Changjiang (the Yangtze River). It is also found on the island of Chusan at the mouth of the Changjiang (Allen and Coolidge 1940). This species was recorded by Zhang *et al.* (1997) as being distributed widely in China in the provinces of Sichuan, Guizhou, Yunnan, Anhui, Jiangsu, Zhejiang, Jiangxi, Hunan, Guangdong, and Fujian, and in the Autonomous Regions of Hainan Island, Guangxi Zhuang, and Tibet. It is recorded (as sightings or burrows) in several sites in central and northeast New Territories (Reels 1996) and on Lantau Island, although not on the smaller outlying islands of Hong Kong (TRAFFIC East Asia *in litt.* 1999). There are no published references on the status of *M. pentadactyla* in Hong Kong, although locally it is considered to be near-threatened (TRAFFIC East Asia *in litt.* 1999).

M. pentadactyla has been recorded in northeastern India from Sikkim eastward (Tikader 1983).

M. pentadactyla has been recorded in north and central Lao PDR (Duckworth *et al.* 1999; Timmins and Evans 1996). Duckworth *et al.* (1999) noted that there are too few locality records to determine the geographic and altitudinal range of the species in the country with any accuracy. Its latitudinal range was thought likely to overlap considerably with that of *M. javanica*, with *M. pentadactyla* tending to occur in hills and mountains and the latter more generally found at lower altitudes.

M. pentadactyla is noted by Salter (1983) as probably widespread in Myanmar, though no recent data on status is available. Corbett and Hill (1992) identify the distribution of *M. pentadactyla* as encompassing most of Myanmar, with the exception of the southern part of the country, which is occupied by *M. javanica*. U Tin Than (WWF Thailand *in litt.* 1999) noted that *M. pentadactyla* is found in the northern part of the country, including the region of Mt. Popa some 100km southwest of Mandalay.

M. pentadactyla is apparently confined to elevations below approximately 1500m in Nepal (Frick 1968; Mitchell 1975).

On Taiwan, *M. pentadactyla* occurs on the periphery of the Central Mountain Range, the Western Foothill Range, the Taoyuan Tableland, the Ouluanpi Tableland, the East Coast Mountain Range, the Tatun Volcano Group, Taipei Basin, Puli Basin, and the Pingtun Plain. The upper limit of occurrence is around 2000m (Chao Jung-Tai 1989; Taiwan Forestry Research Institute *in litt.* 1992).

The only record of *M. pentadactyla* in Thailand is from Doi Inthanon in Changwat, Chiang Mai, sometime in the 1930s (Allen and Coolidge 1940).

All records of *M. pentadactyla* in Viet Nam are from the northern half of the country, as far south as Quang Tri Province (Bourret 1942; Peenen *et al.* 1969).

Asian pangolin[1] imports/exports 1985-1997 (Data Source: WCMC)

		Imports		Exports	
Species	Year	Skin/units	Derivatives/units	Skins/units	Derivatives/units
M. javanica *M. pentadactyla*	1985	39,635* 109 kg --- 1,904*	 --- 480*	15,452* 2 kg --- 1,002*	
M. javanica *M. pentadactyla*	1986	27,518* --- 780*		14,554* 230 kg --- 2,516*	
M. javanica	1987	16,284*		8,701* 126 kg	
M. javanica	1988	6,670*		1,017* 1 kg	
M. javanica	1989	4*		57*	
M. javanica *M. pentadactyla*	1990	5,013* ---	 --- 200*	15,928* 1,366 kg ---	 --- 1608 cartons
M. javanica *M. pentadactyla*	1991	18,722* 530 m^2 --- 5,000* 1,000 kg		308* ---	 --- 2,598 cartons
M. javanica *M. pentadactyla*	1992	20,308* 1,572 kg 368 m^2 --- 5,050* 1,000 kg		1,684* ---	 --- 30,000* 2,030 boxes 1,002 cartons
M. javanica	1993	16,313*		292*	
M. javanica	1994		2,200 kg		4,000 kg
M. javanica *M. pentadactyla*	1995	10,922* 41 kg 63 m^2 ---	 --- 41*	1,160* 114 kg ---	
M. javanica *M. pentadactyla*	1996	9,293* 2,508 kg 85 lb --- 6 kg		285* 8 kg ---	4,000 kg ---
M. javanica *M. pentadactyla*	1997	9,424* --- 1,000*		1,219* --- 500*	

* No units indicated

[1] There has been no reported trade of *M. crassicaudata.*