Implementation of CITES Decision 18.240 paragraph c) on Pangolins (*Manis* spp.)

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Acknowledgments

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Executive summary

All eight species of pangolin were transferred from CITES Appendix II to I at the 17th meeting of the Conference of the Parties (CoP17, Johannesburg, 2016). At CoP18 (Geneva, 2019), the Parties adopted a suite of Decisions pertaining to pangolins. Decision 18.240 paragraph c) directs the CITES Secretariat, subject to external funding, to work with relevant experts and the pangolin range States to prepare a report for review by the Animals Committee and Standing Committee on: i) the national conservation status of pangolin species, ii) legal and illegal trade in pangolins, iii) stocks of specimens of pangolins and stockpile management, and iv) enforcement issues. In December 2020, having acquired the necessary external funding, the CITES Secretariat contracted the International Union for Conservation of Nature (IUCN) to prepare the report referred to in Decision 18.240 paragraph c), in consultation with the CITES Secretariat, and working with relevant experts and pangolin range States.

To inform this report, IUCN developed a questionnaire, in consultation with the CITES Secretariat, with which to collect data from the CITES Parties. The CITES Secretariat made the questionnaire available to Parties as an Annex to Notification to the Parties No. 2021/016. The CITES Secretariat received responses to this Notification from 17 Parties, including 12 pangolin range States: Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Mozambique, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe. The other Parties that responded were The Gambia, Japan, New Zealand, Slovakia, and the United Kingdom of Great Britain and Northern Ireland ('United Kingdom'). Data from the CITES Trade Database were downloaded for the period 2014–2020 and analysed and data on illegal trade were provided by UNODC, the CITES Secretariat, and the CITES Parties. Relevant academic literature on the status of pangolins and illegal trade in the species was also consulted (see Methods).

Global and national conservation status

All eight species of pangolin were assessed at the global level for the IUCN Red List of Threatened Species in 2019. This resulted in *M. pentadactyla, M. javanica*, and *M. culionensis* being categorised as Critically Endangered; *M. crassicaudata, M. gigantea*, and *M. tricuspis* as Endangered; and *M. tetradactyla* and *M. temminckii* as Vulnerable. Previous assessments were conducted in 2014; in the 2019 assessments *M. culionensis* was categorised as Critically Endangered rather than Endangered, and *M. tricuspis* and *M. gigantea* were categorised as

Endangered rather than Vulnerable. These changes were non-genuine based on new information (see IUCN, 2021). The 2019 assessments were based on past, ongoing, and/or future levels of (actual or potential) exploitation, including for illegal international trade, and for the three West and Central African species—*M. gigantea*, *M. tetradactyla* and *M. tricuspis*—rates of forest loss. The assessments reflect that the threat to pangolins from overexploitation is compounded by various factors, including the likelihood that governance and law enforcement changes on a level needed to prevent the overexploitation of pangolins are unlikely to occur in the next few decades, that there is weak evidence that demand reduction efforts for pangolin products in key consumer countries are proving effective, while the incentives for the harvest and illegal trade of pangolins and their parts—at all levels—appears to remain high in large parts of these species' ranges due to the high financial value of pangolins and their parts, in particular, scales.

Status assessments at the national level using the IUCN Red List Categories and Criteria have been completed for seven species but in a small number of range States only. Red List categories range from Near Threatened to Critically Endangered, but some assessments are now a decade old (see Section 4). Critically, there remains a lack of up-to-date knowledge on the status of pangolin populations in most range States, especially in Africa, including population estimates and basic information on distribution. Where research has been conducted, it has generated knowledge of populations. There are recent population estimates for Singapore (~1000 *M. javanica*) (Nash et al., 2021), South Africa (7002–32,135 mature *M. temminckii*) (Pietersen et al., 2016), and Taiwan Province of China (15,000 *M. pentadactyla*) (Kao et al., 2019). Based on responses to Notification to the Parties No. 2021/016 (and 2017/035 and 2014/059) pangolin populations are generally considered by range States to be declining. *Manis tricuspis* was reported to be declining in many range States but was reported to be 'quite common' or 'abundant' in parts of the species range in Central African Republic, Democratic Republic of the Congo (DRC), Gabon, Ghana, Liberia, Sierra Leone, and Togo.

Legal international trade based on data in the CITES Trade Database

There were small volumes of trade in Asian pangolins in the period 2014–2018, but comparatively higher volumes in African pangolins, which included scales, live animals and scientific specimens, among other derivatives. Low volumes of reported trade in Asian pangolins are not surprising given that the species have been subject to zero export quotas since

the year 2000 (i.e., measures almost as restrictive as an Appendix I listing). Most trade in African pangolins involved scales. Overall volumes of trade in pangolins reported to CITES in the period 2014–2018 were small compared to volumes of illegal trade in the period 2016–2020 (see below).

One impact of the transfer of African pangolins from Appendix II to I is that international trade authorised by CITES authorities has ceased but is continuing illegally (see below). However, reports of seizures involving pangolins typically refer to 'pangolin' or '*Manis* spp.,' which precludes accurate assessment of the impact of illegal trade on the different species. Given knowledge gaps around the harvest of pangolins for local and national (i.e., domestic) use and international trade, in particular how harvesters, legal trade actors, and illegal trade networks, operate and how harvest relates to the different levels of use and trade—legal and/or illegal—the lack of accurate recording and reporting of the different pangolin species in illegal trade precludes a holistic understanding of the impact of harvest for use and trade at all levels

Although identification materials for pangolins are available (e.g., USAID's Pangolin Species Identification Guide), several Parties welcomed more training, better access to existing materials, and new identification materials.

Illegal trade based on data provided by UNODC, the CITES Secretariat, Parties, and other sources of information

Between 2016 and 2020 there were 955 seizures involving pangolins or their derivatives that took place in 33 countries. This involved an estimated 258,466 pangolins[1] traded illegally in the form of scales, individuals (including live animals, bodies and skins), meat, medicines, and other derivatives. Of this illegal trade, 98% by volume involved scales, and of illegal trade in scales, 95% by volume can be accounted for by 20 seizures that took place in Côte d'Ivoire, Malaysia, Singapore, Thailand, and Viet Nam between 2017 and 2019. Regarding these seizures, the alleged origin of scales included Cameroon, Congo, DRC, Mozambique, Nigeria, and Côte d'Ivoire or Liberia (i.e., there is uncertainty over alleged origins between Côte d'Ivoire and Liberia). Transit countries reportedly included Malaysia, Singapore, Thailand, and unknown countries. Alleged final destinations included China, Lao People's Democratic

[1] This estimate is based on calculating the number of Equivalent Whole Pangolins (EWP) for illegal trade involving scales using conversion parameters presented in Annex 1.

Republic, and Viet Nam. Of these 955 seizures, 60% were reported as *Manis* spp., i.e., at the genus level[2]. Much smaller numbers of seizures were reported to involve particular species of pangolin, highlighting the lack of identification of pangolins to species level. It should be noted that figures relating to particular species in illegal trade rely on accurate identification of the different pangolin species by law enforcement agencies and which may or may not have been verified and therefore may not be accurate.

Data from other source (e.g., the academic literature drawing on global news, agency and NGO reports as data sources) suggest that actual illegal trade volumes were much higher, involving ~600,000 pangolins between 2016 and 2019 and potentially close to a million pangolins in the last decade, including all eight species.

Disposal of pangolin specimens

Of 17 respondents to the Notification to the Parties 2021/016 questionnaire, eight Parties reported that they have Standard Operating Procedures (SOPs) in place for managing, storing, and disposing of confiscated pangolin specimens while nine Parties do not. Based on all responses to Notification to the Parties 2021/016, 2017/035 and 2014/059, only 19 of 56 pangolin range States have such systems in place. This is a concern for implementation of the Convention because of the number of animals and quantities of their derivatives in illegal trade and the lack of systems in place to ensure that they do not re-enter illegal trade.

Stockpiles and stockpile management

Of the 17 Parties that responded to the questionnaire to Notification to the Parties No. 2021/016, 11 reported that stocks, whether containing pangolin scales, skins, or other derivatives, exist. The stocks range in size from small numbers of scales or specimens to several tonnes of scales. Nigeria, Singapore, and Thailand reported possessing stocks of over 1,000 kg of scales (range = 1450–3117 kg). These are all recorded as *Manis* spp. with the exception of stocks held by Nigeria (3117 kg), which reportedly comprise *M. tricuspis*. Cameroon, Kenya, and Uganda previously reported possessing tonnes of scales. Other Parties hold smaller quantities of scales and other derivatives, including skins and taxidermied specimens. Singapore reported that it has privately held stocks of pre-Convention scales, skins, and stuffed

[2] It should be noted that scientific consensus is to use three genera for pangolins (*Manis, Phataginus*, and *Smutsia*, but the CITES nomenclature and this report uses a single genus (*Manis*) for all species.

specimens and reported that the intended use is commerce. Based on responses to earlier Notifications (i.e., 2017/035 and/or 2014/059), and without more up-to-date information, sizable stocks (>1,500 kg) of scales may still exist in Cameroon, China, Kenya, and Uganda. Côte d'Ivoire reported possessing 3000 kg of *Manis* spp. scales but reports in the press suggest that this quantity of scales was recently destroyed. Other Parties reported destroying much smaller quantities of specimens.

The destruction of stocks is one of the recommended provisions of Res. Conf. 17.8 for confiscated and accumulated dead specimens of Appendix-I species, including parts and derivatives, if not being stored or used for bona fide scientific, educational, enforcement, or identification purposes. Parties are also not supposed to sell off confiscated Appendix-I specimens. However, it should be noted that insights from the examination of stockpile issues for other species (e.g., elephants; see 't Sas-Rolfes et al., 2014) suggests that stock destruction may violate the precautionary principle because associated outcomes for pangolin conservation are unknown. This could be the case if stockpile destruction led to accelerated wild harvest of pangolins if organised crime groups involved in trafficking sought to recover losses incurred through the seizure of large volumes of scales.

Enforcement challenges

A number of law enforcement challenges were identified by range States in Africa and Asia. Eleven Parties reported that a lack of equipment and technical or human resources are challenges to effective law enforcement, though it should be noted that these challenges are not necessarily pangolin-specific. They include a lack of equipment (e.g., scanners, sniffer dogs), a lack of vehicles and fuel to conduct patrols (especially in more remote locations), and a lack of resources to detain individuals that have been apprehended (e.g., transport). Other challenges include inadequate budgets to effectively enforce applicable laws—including to employ sufficient numbers of well-trained law enforcement staff—a lack of law enforcement personnel, and an inadequate capacity of frontline law enforcement officers. Many of these challenges were highlighted five years ago CITES SC69 Doc. 57. Annex 1 and are ongoing.

Nigeria reported that corruption influenced the ability of the country to enforce laws affording protection to pangolins from poaching and trafficking. Nigeria described these issues as: (i) a lack of data management to ensure accountability among agencies, (ii) the long prosecution

process which results in out of court settlements, (iii) seizures which are ostensibly abandoned, and (iv) funds for equipment (e.g., scanners at seaports) being appropriated.

Law enforcement best practices

Pangolin range States reported a number of law enforcement best practices regarding combatting the poaching and illegal trade of pangolins. These include inter-agency cooperation and collaboration, intelligence networking within local communities co-existing with pangolins, the use of technologies such as SMART to help map poaching hotspots, and among others, the adoption of a whole-of-government approach, including a robust domestic framework combing strong enforcement, tough laws, and heavy penalties.

Operations to combat pangolin poaching and trafficking

Parties reported that they had collaborated with other countries and/or participated in international operations (e.g., under INTERPOL, World Customs Organization (WCO), and Wildlife Enforcement Networks) aimed at combating the poaching and illegal trade in species that has specifically or inadvertently included pangolins. Of Parties responding to Notification to the Parties 2021/016, many had taken part in the INTERPOL and WCO Thunder operation in 2020, which resulted in seizures of pangolins, and other similar operations.

Tools and materials for implementing Res. Conf. 17.10

A number of Parties indicated that they have, or are, developing tools or materials that could assist in the implementation of Resolution Conf. 17.10. They include the Centre for Wildlife Forensics in Singapore, which launched in August 2020, to strengthen Singapore's detection and diagnostic capabilities to identify and analyse specimens involved in the illegal wildlife trade. They also include the development of a technique, by a team from the University of Portsmouth in the United Kingdom, for lifting fingerprints from the scales of pangolins, demonstrating the potential to connect criminals to illegally traded pangolins via fingerprints.

Dismantling of organised crime groups

Singapore and China reported that, through a collaboration, they had dismantled an organised crime group. Key to this was sharing information through mutual legal assistance channels. This bilateral information exchange helped China to pursue its investigations, leading to arrests of suspects of Chinese nationality based in Africa and Viet Nam.

1. Introduction

All eight pangolin species (*Manis* spp.) were transferred from Appendix II to I at the 17th meeting of the Conference of the Parties to CITES (CoP17, Johannesburg, 2016). At CoP18 (Geneva, 2019), the Parties adopted a suite of Decisions pertaining to pangolins, in particular Decisions 18.238 to 18.243, and Decision 18.315 on Nomenclature of Manidae spp.

Decision 18.240 paragraph c), directs the CITES Secretariat, subject to external funding, to work with relevant experts and the pangolin range States to prepare a report for review by the Animals Committee and Standing Committee on:

i) the national conservation status of pangolin species;
ii) legal and illegal trade in pangolins;
iii) stocks of specimens of pangolins and stockpile management; and
iv) enforcement issues.

Decision 18.243 directs the Animals Committee to review any information brought to its attention by the Secretariat in accordance with Decision 18.240 and make recommendations as appropriate to the Standing Committee and Secretariat. Decision 18.241 paragraph a) directs the Standing Committee to consider this report and any recommendations of the Secretariat in accordance with Decision 18.240 paragraph c) and any recommendations of the Animals Committee in accordance with Decision 18.243. Decision 18.241 paragraph b) directs the Standing Committee to make recommendations to the Parties or the Secretariat as appropriate, and paragraph c) directs the Standing Committee to report the results of its work together with any recommendations it may have to the 19th meeting of the Conference of the Parties.

In December 2020, having acquired the necessary external funding, the CITES Secretariat contracted the International Union for Conservation of Nature (IUCN) to prepare the report referred to in Decision 18.240 paragraph c), in consultation with the CITES Secretariat, and working with relevant experts and pangolin range States.

2. Methodology

To inform this report, IUCN developed a questionnaire in consultation with the CITES Secretariat to collect data from the CITES Parties on: i) the national conservation status of pangolins, ii) illegal trade involving pangolins within the last 5 years (2016–2020), iii) stockpiles and stockpile management, and iv) enforcement issues regarding regulation and control of trade in pangolins and their derivatives. The CITES Secretariat made the questionnaire available to Parties as an Annex to Notification to the Parties No. 2021/016. The CITES Secretariat received responses from 17 Parties, including 12 pangolin range States: Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Mozambique, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe. The other responding Parties were The Gambia, Japan, New Zealand, Slovakia, and the United Kingdom of Great Britain and Northern Ireland ('United Kingdom'). Given the low response rate among Parties, this report also draws on information in CITES SC69 Doc. 57 Annex 1, which reported on responses to Notification to the Parties No.'s 2017/035 and 2014/059, to provide the Parties with a broader evidence base.

To additionally inform this report on the national conservation status of pangolins, a review of relevant scientific literature was conducted. This paid particular attention to summaries of knowledge of pangolins and their status in a recently published book (Challender et al., 2020a), updated IUCN Red List assessments for each pangolin species (published in December 2019), and a USAID West Africa Biodiversity and Climate Change (WA BiCC) report on pangolins in West and Central Africa completed in 2020 (WA BiCC, 2020).

Legal trade data on pangolins were downloaded from the CITES Trade Database (UN Environment - World Conservation Monitoring Centre, Cambridge, UK) for analysis on 2nd January 2021 (Section 5). This included all exporting and importing countries, all sources, purposes, and trade terms for the Manidae. Though data were downloaded for the period 2014–2020 to enable analysis of 5 years' worth of data, the latest year for which complete data are likely available is 2018. This captured trade in the year 2019 for some Parties, but recognises that these data are not complete among all Parties. Where large quantities (>100 kg) of scales are discussed, the number of Equivalent Whole Pangolins (EWP) is presented in parentheses using the conversion parameters in Annex 1. Both direct trade and re-exports are summarised for each species and tabulated raw data are provided in Annexes 4 and 5.

Illegal trade data were provided by individual Parties, the CITES Secretariat, and the United Nations Office on Drugs and Crime (UNODC). Data were provided for the period 2016–2020 to enable analyses of 5 years' worth of data. Namibia also provided data on a number of seizures from early 2021 that were included in the dataset. These data were compiled in an Excel database and cross-referenced by seizure characteristics (e.g., date, quantity of animals/scales) to avoid inclusion of duplicate records. Where duplicate records were found they were excluded from analysis. For seizures involving quantities of scales, the EWP was calculated using the conversion parameters in Annex 1. Recognising inherent biases in seizure data—relating to enforcement effort and rates of seizure and reporting (see Challender et al., 2021)—data from the above sources are summarised in this report paying attention to the parts and derivatives traded illegally, the estimated number of pangolins in illegal trade, the species involved, where identification to species level was possible, and trafficking routes, including countries of origin, transit, and destination.

It should be noted that Decision 18.239 concerns the development of conversion parameters for all pangolin species to enable the reliable determination of the number of animals associated with any quantity of pangolin scales seized. This Decision is being implemented by IUCN but as that work is ongoing the results from that Decision do not inform this report.

3. Pangolins and their inclusion in CITES

Pangolins (*Manis* spp.) are placental mammals covered in overlapping scales comprised of keratin. There are eight extant species, four of which are native to Asia, the Chinese pangolin *M. pentadactyla*, Sunda pangolin *M. javanica*, Indian pangolin *M. crassicaudata*, and Philippine pangolin *M. culionensis*; and four are native to Africa, the white-bellied pangolin *M. tricuspis*, black-bellied pangolin *M. tetradactyla*, giant pangolin *M. gigantea*, and Temminck's pangolin *M. temminckii*. They are widely distributed on each continent (Section 4) and, collectively, occur in habitats ranging from tropical and sub-tropical forests, including limestone, mixed coniferous, broadleaf, riparian, and swamp forests, to savanna-forest mosaics, grasslands, and artificial landscapes including gardens and plantations (Gudehus et al., 2020; Pietersen et al., 2020a; Wu et al., 2020).

Generally, pangolins are split into three genera: *Manis* for the Asian *species*, *Phataginus* for the arboreal African species (the black- and white-bellied pangolins), and *Smutsia* for the terrestrial African species (giant and Temminck's pangolin) (Challender et al., 2020a; Gaubert et al., 2018; 2020; IUCN, 2021). However, the mammalian taxonomic reference used by CITES (Wilson and Reeder, 2005) includes all eight species in the genus *Manis* and this nomenclature is followed in this report. It should be noted that Decision 18.315 directs the Animals Committee to examine the taxonomy and nomenclature of pangolins (Manidae spp.) and propose a way forward to clarify a listing of pangolins on the Appendices.

Pangolins have a long history in CITES. As well as the inclusion of *Manis pentadactyla, M. javanica, M. crassicaudata*, and *M. temminckii* in the Appendices in 1975, the Asian species were part of the Review of Significant Trade (RST) process in the 1980s, 1990s, and 2000s (Challender and O'Criodain, 2020; Challender et al., 2015). At CoP11 (Gigiri, 2000), zero export quotas were established for the Asian species for trade in wild-caught specimens for commercial purposes. At SC45 (Paris, 2001), the Standing Committee agreed that if the zero quotas were removed, and before any exports took place, any range State wishing to trade in these species should satisfy the Secretariat that recommendations from Phase IV of the RST (in 1999) were implemented. This included ensuring that: (i) an assessment of the distribution and population status (including abundance) of the species in all range states that authorize exports of specimens of these species had been completed, (ii) that the competent authority of

Lao People's Democratic Republic and the Management Authorities of Cambodia, China, Indonesia, Malaysia, Myanmar, Singapore, Thailand, and Viet Nam had developed and implemented adequate control measures and inspection procedures to detect and intercept illegal shipments of specimens of all *Manis* spp., and (iii) that the authorities of all range States wishing to trade in pangolins, their parts and derivatives have developed adequate, scientifically based population monitoring systems and measures to identify and regulate exports of legally obtained specimens.

Due to ongoing concerns about the sustainability of pangolin exploitation, including for international commerce, all eight species of pangolin were transferred from Appendix II to I of CITES at CoP17 (Johannesburg, 2016). CoP17 also adopted Resolution Conf. 17.10 on *Conservation of and trade in pangolins.* This resolution calls for a range of measures to be implemented by Parties and other stakeholders. These include Parties adopting comprehensive legislation with provisions for deterrent penalties to address illegal trade in pangolins; the promotion of forensic science for identifying parts and derivatives of pangolins in trade; encouraging range States to work with local communities to sustainably manage pangolin populations; and, among others, the development of *in situ* pangolin management and conservation programmes. At CoP18 the Parties adopted a suite of Decisions on pangolins, including Decision 18.240 paragraph c), which called for this report.

4. Global and national conservation status

A total of 12 pangolin range States (Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Mozambique, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe) responded to the questionnaire annexed to Notification to the Parties No. 2021/016. In this section, a summary of the global and national conservation status of pangolins is presented, which draws on these questionnaire responses and other information (see Methods). It also draws on CITES SC69 Doc. 57 Annex 1, which reported on responses to Notification to the Parties No.'s 2017/035 and 2014/059, and comprises the last major report on pangolin status, trade, and conservation for CITES.

4.1 Status of Asian pangolins

Pangolins are widely distributed in Asia (Table 1). Each species of Asian pangolin is threatened with extinction, being listed as either Critically Endangered (*M. pentadactyla, M. javanica, M. culionensis*) or Endangered (*M. crassicaudata*) on the IUCN Red List of Threatened Species (Table 1). Previous assessments were conducted in 2014. In the 2019 assessments *M. culionensis* was categorised as Critically Endangered rather than Endangered, which reflects a non-genuine change based on new information (IUCN, 2021). The 2019 assessments are based on past, ongoing, and/or future levels of exploitation, either actual or potential, and reflect high levels of harvesting for commercial level trafficking in the animals, their scales, and other derivatives in recent decades, combined with local use, both of which are expected to continue in the future. They also reflect that the threat from overexploitation is compounded by various factors, including the likelihood that governance and law enforcement changes on a level needed to prevent the overexploitation of pangolins are unlikely to occur within three generations time (24 years for *M. crassicaudata*; 21 years for *M. pentadactyla, M. javanica* and *M. culionensis*). They also reflect that there is weak evidence that demand reduction efforts in key consumer countries for pangolin products are proving effective. In contrast, incentives for the harvest and illegal trade of pangolins and their parts remain high in large parts of the species' ranges due to the high financial value of the animals and their derivatives, including scales. In the below subsections, additional, relevant information about these species and the corresponding Red List assessments is provided prior to the presentation of available information on the status of each species in each range State.

Table 1. Species, distribution, and summary of 2019 IUCN Red List assessments for Asian pangolins.

Species	Distribution	Assessment overview
Manis pentadactyla	Bangladesh, Bhutan, China, Hong Kong SAR, India, Lao People's Democratic Republic, Myanmar, Nepal, Taiwan Province of China, Thailand, Viet Nam	**Critically Endangered (A3d+4d)** - Based on suspected declines of >80% over a time frame of three generations, both looking forward two generations and back one generation (2012–2033) and looking forward three generations (2019–2040). Generation length estimated at 7 years. Source: Challender et al. (2019a).
Manis javanica	Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Singapore, Thailand, Viet Nam *Presence uncertain: China	**Critically Endangered (A2+3d+4d)** - Based on inferred population declines of >80% over the past three generations (21 years; from 1998–2019; generation length estimated at 7 years) due to overexploitation from hunting and poaching for commercial-level international trade and trafficking. Being precautionary, *M. javanica* also qualifies for Critically Endangered looking forward three generations (2019–2040) and looking back one generation and forward two generations (2012–2033). Source: Challender et al. (2019b).
Manis culionensis	Philippines	**Critically Endangered (A3d+4d) -** Based on a precautionary assessment it was inferred that the population will decline by >80% looking forward three generations (2019–2040) and looking back one generation and forward two generations (2012–2033). Generation length estimated at 7 years. Source: Schoppe et al. (2019).
Manis crassicaudata	Bangladesh, India, Nepal, Pakistan, Sri Lanka *Presence uncertain: China	**Endangered (A3d+4d)** - Being precautionary, the assessment suspected that populations may decline by 50% in the future over a time frame of three generations (2019–2043; generation length estimated at 8 years) due to overexploitation. It was inferred that populations will experience an ongoing decline exceeding 50% in the time frame of three generations looking back one generation and forward two generations (2011–2035) due to overexploitation. Source: Mahmood et al. (2019).

4.1.1 *Manis pentadactyla*

Declines are suspected or inferred based on high levels of indiscriminate hunting and poaching, both targeted and untargeted, for local use and for illegal international trade, including to China (Challender et al., 2019a). This trade involves whole animals (live and dead) as well as meat and scales, and it has been estimated that between the years 2000 and 2013 international trafficking in this species potentially involved 50,000 individuals (Challender et al., 2015). Other documented threats, which apply variously across the species range, include infrastructure development, habitat loss and fragmentation, and pesticide use. In China, major developments including hydropower stations and mining pose a threat (Challender et al., 2019a; Wu et al., 2020). The Red List assessment for *M. pentadactyla* notes that Hong Kong SAR and Taiwan Province of China, and potentially Bhutan, are the only parts of the species' range where overexploitation is not thought to be a threat to the species (Challender et al., 2019a). In Hong Kong SAR and Taiwan Province of China populations are not threatened by heavy hunting or poaching pressure, but are otherwise by feral dogs, roadkill, the conversion of land for human use, and, in Taiwan Province of China, from gin traps (Challender et al., 2019a; Sun et al., 2019). A summary of the status of the species in each range State is presented in Table 2 and more detailed information for each range State is presented in Annex 2.

Table 2. Status of *Manis pentadactyla* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Bangladesh	Population declined (2021/016)	*Assessed as Critically Endangered in 2015 National Red List assessment. *Species reported extirpated from some areas due to commercial level poaching.
Bhutan	No information	
China	Population remained stable (2021/016)	*Listed as Critically Endangered in China's mammal Red Data Book (Jiang et al., 2016). *Populations reportedly declined by up to 94% in the period 1960s–early 2000s (Wu et al., 2004).

		*There have been observations of the species in eight provinces in the last decade, including evidence of breeding (Zhang et al., 2021).
Hong Kong SAR	No information	*In 2017, experts considered there to be low poaching pressure (Annex 2).
Taiwan Province of China	Population stable, if not increasing (Kao et al., 2019)	*Approximate meta-population of 15,000 individuals (Kao et al., 2019).
India	Data deficient (2021/016)	*Assessed as Endangered in India in 2005 using IUCN's Red List Categories and Criteria (see Annex 2).
Lao PDR	No information	
Myanmar	No information	
Nepal	Data deficient (2017/035)	*Population estimated at 5000 individuals when species assessed as Endangered in Nepal using IUCN's Red List Categories and Criteria (Jnawali et al., 2011).
Thailand	Population declined (2021/016)	
Viet Nam	Population declined (2014/059)	*Considered very rare.

4.1.2 *Manis javanica*

The IUCN Red List assessment is based on very high levels of harvest for commercial trafficking of live and dead individuals seemingly across the species' range, combined with ongoing exploitation for local use. Challender et al. (2020a) estimated that trafficking in Asian pangolins between 2001 and 2018 potentially involved >280,000 individuals, most of which involved this species. The pervasive snaring throughout Southeast Asia (Gray et al. 2017) means that *M. javanica* is at risk of accidental mortality or injuries in most forests across the region. Although local use poses a threat, evidence suggests that this is now largely forgone in favour of international trade, given the high monetary value of this species (Newton et al., 2008; MacMillan and Nguyen, 2013). Other threats include roads (i.e., the species is killed by traffic) and water management systems (e.g., the creation of dams). It appears that Singapore and smaller islands (e.g., those surrounding mainland and island Southeast Asia within the species' range) are the only places where overexploitation is not a threat. A summary of the status of the species in each range State is presented in Table 3 and more detailed information for each range States is presented in Annex 2.

Table 3. Status of *Manis javanica* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Brunei Darussalam	Population increased (2014/059)	*Species is present in all four districts in the country (Annex 2).
Cambodia	Population considered to be declining (see Challender et al., 2019b)	*Species is present in a number of reserves but considered to be declining (Annex 2). *Categorized as 'rare' in 2007.
China	Data Deficient in China's mammal Red Data book (Jiang et al., 2016)	*Uncertain whether the species occurs in China (Annex 2). China is investigating the potential distribution in the country.
Indonesia	Data Deficient (2021/016)	*Evidence suggests species is negatively affected by overexploitation (Annex 2).
Lao PDR	No information	*Widespread historically but reported declines of >90% in the 1990s (Annex 2).
Malaysia	No recent information	*Previously described as common in Peninsular Malaysia but reportedly declined due to poaching (Annex 2). *Species categorised as Vulnerable in 2012 using IUCN's Red List Categories and Criteria. *Previously described as common in Sabah but under demonstrable collection pressure (Annex 2). *Little information for Sarawak but considered to be declining (Annex 2).
Myanmar	No information	
Singapore	Population considered stable (Nash et al., 2020)	*Population estimated at 1046 (575–1046) individuals (Nash et al., 2020).
Thailand	Population declined (2021/016)	
Viet Nam	Population declined (2015/035)	*Population declines inferred from research conducted in three provinces in the country (Annex 2).

4.1.3 *Manis culionensis*

Manis culionensis is endemic to the Philippines where it occurs on Palawan and six much smaller, adjacent islands: Busuanga, Balabac, Coron, Culion, and Dumaran Islands, and has been introduced to Apulit Island (Schoppe et al., 2019). The IUCN Red List assessment was based on levels of exploitation from hunting and poaching, which evidence indicates is increasingly for illicit, international trade, as well as domestic use and trade. This is compounded by the species' limited geographic distribution and development on Palawan decreasing the area of available natural habitat. It is further compounded by factors affecting all Asian pangolins. The status of the species in the Philippines is presented in Table 4 and more detail is provided in Annex 2.

Table 4. Status of *Manis culionensis* in range States.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Philippines	Population reportedly declining (see Annex 2).	*Previously listed as Vulnerable under the Department of Environment and Natural Resources (DENR) Administrative Order 2004-15. *Since January 2017, species categorised as Critically Endangered. *Variously described as common and uncommon historically; reportedly more abundant in the north of the geographic range (see Annex 2).

4.1.4 *Manis crassicaudata*

The species is targeted for local consumption across most of its range (e.g., D'Cruze et al., 2018) and is increasingly targeted for international trafficking to overseas markets, mainly China, predominantly involving scales (Mohapatra et al., 2015). There appears to have been a shift in trafficking attention to this species following declines in populations of *M. javanica* and *M. pentadactyla* (Mahmood et al., 2012; Challender et al., 2015); this is compounded by factors affecting all Asian pangolin species as discussed. Perera and Karawita (2020) reviewed threats to *M. crassicaudata* in Sri Lanka. Exploitative threats are hunting for subsistence and to sell the meat (and possibly, scales), and capture in traps intended for other species. Other

threats include loss and deterioration of habitats, agricultural expansion, *ad-hoc* use of pesticides and roads (Chakkaravarthy 2012; Karawita et al., 2016). More detail on the status of the species is provided in Table 5 and Annex 2.

Table 5. Status of *Manis crassicaudata* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Bangladesh	Population declined (2021/016)	*Assessed as Critically Endangered in 2015 National Red List assessment.
China	Data Deficient in China's mammal Red Data book (Jiang et al., 2016)	*Uncertain whether the species occurs in China (Annex 2). China is investigating the potential distribution in the country.
India	Data Deficient (2021/016)	*Categorised as Vulnerable in 2005 using the IUCN Red List Categories and Criteria (Molur, 2005).
Nepal	Population declining (Jnawali et al., 2011)	*Assessed as Endangered in 2011 using the IUCN Red List Categories ad Criteria (Jnawali et al., 2011).
Pakistan	Population declining (inferred from Irshad et al., 2015)	*Assessed as Vulnerable in Pakistan in 2005 using the IUCN Red List Categories and Criteria (Molur, 2005). *Populations in the Potohar Plateau reportedly declined by 80% between 2010 and 2012 (Irshad et al., 2015). Caution is needed on interpretation of this trend due to the methods used (see Willcox et al., 2019).
Sri Lanka	No information	*Assessed as Near Threatened in 2012 using the IUCN Red List Categories and Criteria (Ministry of Environment, 2012). Pabasara (2016) reported a population density of 5.69 individuals/km^2 in tropical lowland rainforest.

4.2 Status of African pangolins

Pangolins occur throughout much of sub-Saharan Africa (Table 6). Three species (*M. tetradactyla, M. tricuspis,* and *M. gigantea*) principally occur in West and Central Africa, while the fourth (*M. temminckii*) ranges across much of East and southern Africa and parts of northern Central Africa. Each African pangolin species is threatened with extinction, being listed as either Endangered (*M. tricuspis*, *M. gigantea*) or Vulnerable (*M. tetradactyla*, *M. temminckii*) on the IUCN Red List of Threatened Species (Table 6). Previous assessments were conducted in 2014. In the 2019 assessments, *M. tricuspis* and *M. gigantea* were categorised as Endangered rather than Vulnerable, changes that were non-genuine and based on new information (IUCN, 2021). The 2019 assessments are based on past, ongoing, and/or future levels of population decline, either actual or potential. Species-specific information is presented in the following subsections but, broadly, these assessments reflect high levels of harvesting for commercial trafficking in recent decades combined with local use, both of which are expected to continue in the future. These threats are further complicated by often extreme habitat loss or degradation, especially in West Africa. As for Asian pangolins, these assessments further reflect that the threat from overexploitation and habitat loss are compounded by various factors related to law enforcement and governance and that changes on a level needed to prevent the overexploitation of pangolins are unlikely to occur within three generations time for each species (21 years for *M. tricuspis* and *M. tetradactyla,* 45 years for *M. gigantea* and *M. temminckii*). There is also weak evidence that demand reduction efforts in key consumer countries for pangolin products and derivatives are proving effective, while incentives for the harvest and illegal trade of pangolins and their parts, principally scales, continue throughout the range of African species, particularly as Asian pangolins continue to decline. The human population of sub-Saharan Africa is also expected to double by 2050, with the largest increases in DRC and Nigeria (United Nations, 2019), which will likely place greater pressure on pangolin populations.

There is little information on the impact of exploitation on wild pangolin populations throughout most of Africa despite increasing concern over large quantities of individuals being extracted from the forests of West and Central Africa for illegal, intercontinental trade in scales (WA BiCC 2020). This problem is often compounded by lack of identification of pangolins and their parts and derivatives to species level, where trade, traffic, and even wild observations

Table 6. Species, distribution and summary of 2019 IUCN Red List assessments for African pangolins.

Species	Distribution	Assessment overview
Manis tricuspis	Angola, Benin, Burundi, Cameroon, Central African Republic, Congo, DRC, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Nigeria, Rwanda, Sierra Leone, South Sudan, Togo, Uganda, United Republic of Tanzania, Zambia *Presence uncertain: Burkina Faso, Mali, Niger	**Endangered (A2c+4cd)** – Taking a precautionary approach it is inferred that populations have declined by up 40% over the past 21 years (3 generations; generation length estimated at 7 years) based on forest loss and increasing rates of exploitation. It is also inferred that populations could decline by up to 50% over a period of 21 years (three generations), looking back one generation and forward two generations (2012–2033) (Pietersen et al. (2019a).
Manis tetradactyla	Cameroon, Central African Republic, Congo, DRC, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Liberia, Mali, Nigeria, Sierra Leone. *Presence uncertain: Angola, Benin, Guinea-Bissau, Senegal, South Sudan, Togo, Uganda	**Vulnerable (A2cd+4cd) -** Meets criterion A2cd based on declines in area of occupancy and habitat quality over the period of the last three generations (21 years; 1998–2019, generation length estimated at 7 years), given rates of forest loss in West and Central Africa and ongoing and intensifying exploitation. It meets criteria A4cd using a period of 21 years (14 years past, 7 years future) because it is inferred that suitable habitat has been lost in the last 14 years and will continue to be so; populations have been and are expected to continue to be exploited unsustainably resulting in declines of 30-40% (Ingram et al., 2019).
Manis gigantea	Benin, Cameroon, Central African Republic, Congo, Côte d'Ivoire, DRC, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Uganda, United Republic of Tanzania *Presence uncertain: Angola, Burkina Faso, Niger	**Endangered (A2cd+4cd)** – Meets criterion A2c based on declines in area of occupancy and habitat quality over a period of three generations (45 years) and A2d because it is reasonable to infer that, coinciding with forest loss, populations have declined by 50% over a period of three generations (1974-2019) due to exploitation. The species meets criteria A4cd using a period of 45 years (three generations; 30 years past, 15 years future) because it is inferred that suitable habitat has been lost in the last 30 years and will continue to be so; populations are expected to continue to be overexploited (Nixon et al., 2019).
Manis temminckii	Angola, Botswana, Burundi, Central African Republic, Chad, DRC, Ethiopia, eSwatini, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, South Sudan, Sudan, Uganda, United Republic of Tanzania, Zambia, Zimbabwe	**Vulnerable (A4cd)** – Being precautionary it is inferred past/ongoing and future population reduction of 30–40% over a 45 year period (15 years past, 30 years future; generation length estimated at 15 years) based on ongoing exploitation throughout the species' range. True rates of decline are imperfectly known but are unlikely to exceed 50% (Pietersen et al., 2019b).

are often communicated simply as 'pangolins,' rather than by species. However, using scaled hunting data, Ingram et al., (2018) estimated that 0.4–2.7 million pangolins are hunted annually in Central African forests and suggested that the number of pangolins hunted has increased by 150%, and that the proportion of pangolins as a proportion of all vertebrates hunted increased from 0.04% to 1.83% between 1975 and 2014. There were no trends in pangolins observed at markets in this study, suggesting the use of alternative supply chains. On average, 45% of pangolins were reported to be juveniles or sub-adults, suggesting that the hunting of Central African pangolins is potentially unsustainable (Ingram et al., 2018). The price of *M. gigantea* in urban markets has increased 5.8 times since 1975, while the price of *M. tricuspis* and *M. tetradactyla* has increased 2.3 times, mirroring trends in Asian pangolins (Ingram et al., 2018).

Habitat loss and degradation is also a threat to all four African pangolin species (Ingram et al. 2019; Nixon et al. 2019; Pietersen et al. 2019a, b). Africa has one of the highest global rates of primary forest loss and it is estimated that 80% of original forest in West Africa, home to three species of pangolin, has been converted to an agricultural mosaic with an estimated loss of 10 million ha of forest in the twentieth century (Norris et al., 2010). Electrocution from electric fences is a significant threat to *M. temminckii* in South Africa (Pietersen et al., 2019b,c).

There is less information available on African than Asian pangolins but the publication of the first book dedicated to pangolins and their conservation (Challender et al. 2020a), the 2019 IUCN Red List assessments for all four African species (Ingram et al. 2019; Nixon et al. 2019; Pietersen et al. 2019a, b), and the USAID WA BiCC *Scoping Study on the Pangolins of West and Central Africa* (WA BiCC 2020), permit a more in-depth assessment than was available in CITES SC69 Doc. 57 Annex 1. In the below subsections, knowledge of the status of African pangolins is summarised. More detailed information for each species in each range State is presented in Annex 3, including first steps on improving the evidence base for each species-country combination.

4.2.1 *Manis tricuspis*

Manis tricuspis is the most common of the African forest pangolins, reaching relatively high densities in suitable habitat (Kingdon and Hoffmann, 2013). It is also the species most commonly encountered in wildmeat markets and in illegal scale seizures to date, where it is exploited for bushmeat and for use in traditional African medicine and is trafficked

internationally. Anthropogenic activities, including mining and logging, may exacerbate these threats by increasing accessibility to previously inaccessible areas. For the major threats—overexploitation and habitat loss—the risk and rate of loss is likely different between West and Central Africa. Higher levels of habitat loss and human population growth in West Africa has resulted in proportionally higher rates of decline in this region (likely >50%), both past and expected in the future. West Africa has deforestation rates that are three times higher than the Congo basin, higher human population densities, and smaller areas without roads. A summary of the status of the species in each range State is presented in Table 7 and more detailed information for each range States is presented in Annex 3.

Table 7. Status of *Manis tricuspis* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Angola (Cabinda)	No information	
Benin	Data Deficient (Sinsin and Hesson, 2004)	*Species common to rare in different regions but populations are likely declining precipitously (Annex 3).
Burkina Faso	No information	*Presence uncertain
Burundi	No information	*Presence uncertain
Cameroon	Population likely declining, maybe precipitously, but still considered abundant (WA BiCC, 2020)	*Densities of 0.68 individuals/km^2 recorded (Bobo et al., 2014).
Central African Republic	Population likely declining but still quite common (WA BiCC, 2020)	
Congo	No information	
Côte d'Ivoire	Data Deficient (2021/016)	*Not uncommon in places (WA BiCC, 2020).
DRC	Population stable or slightly declining (WA BiCC, 2020)	*Generally considered to be quite abundant (WA BiCC, 2020)
Equatorial Guinea	No information	

Gabon	Population stable or slightly increasing (WA BiCC, 2020)	*Very abundant throughout the country.
Ghana	Thought to be declining, may be precipitously (Bräutigam et al, 1994, WA BiCC, 2020)	*Considered common or abundant in some sites (WA BiCC, 2020) (Annex 3).
Guinea	Thought to be declining despite being fairly common (Bräutigam et al, 1994, WA BiCC, 2020)	
Guinea-Bissau	No information	
Kenya	No information	
Liberia	Likely declining but abundant or very abundant (WA BiCC, 2020)	
Mali	No information	*Presence uncertain
Niger	No information	*Presence uncertain
Nigeria	Data Deficient (2021/016) Species likely declining, may be precipitously, but may be common in some areas (WA BiCC, 2020)	
Rwanda	No information	*Previously reported to be close to extinction in the country (Bräutigam et al., 1994).
Sierra Leone	Population declining though species may be common to abundant to some areas (WA BiCC, 2020)	*Species likely declining in the Portloko and part of the Tonkolili Districts due to loss of habitat (Annex 3).
South Sudan	No information	
Togo	Species is likely declining though considered common to abundant in some areas (WA BiCC, 2020)	
Uganda	Populations reported to be declining rapidly (Kityo et al., 2016)	*Assessed as Endangered nationally in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).
United Republic of Tanzania	No information	Considered rare (see Annex 3).
Zambia	No information	

4.2.2 *Manis tetradactyla*

Manis tetradactyla is exploited for bushmeat and for use in traditional African medicine and is trafficked internationally. Anthropogenic activities, including mining and logging, may exacerbate these threats by increasing accessibility to previously inaccessible areas. For the major threats—overexploitation and habitat loss—the risk and rate of loss is likely different between West and Central Africa. Higher levels of habitat loss and human population growth in West Africa has resulted in proportionally higher rates of decline in this region (likely >50%), both past and expected in the future. West Africa has deforestation rates that are three times higher than the Congo basin, higher human population densities, and smaller areas without roads. Information on status in each range State is presented in Table 8 and Annex 3.

Table 8. Status of *Manis tetradactyla* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Angola	No information	Presence uncertain though possibly present in Cabinda (see Annex 3).
Benin	No information	Presence uncertain
Cameron	Population likely declining, maybe precipitously in some areas, but is still considered common throughout the country (WA BiCC, 2020)	
Central African Republic	Population likely declining though not uncommon (WA BiCC, 2020)	
Congo	No information	*Based on the distribution of suitable habitat, likely quite widely distributed throughout the country and potentially quite abundant (Annex 3).
Côte d'Ivoire	Data Deficient (2021/016); Species likely declining (WA BiCC, 2020)	
DRC	Population likely stable and species common to abundant throughout the country (WA BiCC, 2020)	

Equatorial Guinea	No information	*Based on the distribution of suitable habitat, likely quite widely distributed throughout the country and potentially a common species (Annex 3).
Gabon	Population stable or slightly increasing; species abundant in the country (WA BiCC, 2020)	
Ghana	Population likely declining, precipitously in some areas, though likely not uncommon in areas of suitable habitat (WA BiCC, 2020)	
Guinea	Population likely declining though species likely common throughout the county (WA BiCC, 2020).	
Guinea-Bissau	No information	*Presence uncertain
Liberia	Population reportedly declining though species likely common in the country (WA BiCC, 2020)	
Mali	No information	
Nigeria	Data Deficient (2021/016); Species is declining precipitously and appears to be rare in the country (WA BiCC, 2020)	
Senegal	No information	*Presence uncertain
Sierra Leone	Species is likely declining, even precipitously in some areas, and appears to be uncommon in the country (WA BiCC, 2020)	
South Sudan	No information	*Presence uncertain
Togo	No information	*Presence uncertain
Uganda	No information	*Presence uncertain but the species was assessed as Endangered nationally in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).

4.2.3 *Manis gigantea*

Manis gigantea is a somewhat enigmatic species and, despite its prevalence in trade, is a poorly known and little researched species (Hoffmann et al., 2020). It has historically been thought to be associated with the humid forests throughout its distributions, but it is now known to occupy

a much wider diversity of habitats. It is a solitary, nocturnal, and elusive species, which makes it difficult to census and, as a result, there is no reliable information on population abundance or even site occupancy (Hoffmann et al., 2020). The species is believed to be generally rare and populations are thought to be declining across the geographic range, though observations in previously undocumented localities are continuing to emerge. Like other tropical African pangolins, the main threats to the species are overexploitation and habitat loss and fragmentation. Intercontinental trafficking of tropical African pangolin scales to Asia has seemingly increased in the last decade (Challender and Waterman, 2017; Ingram et al., 2019). Information on status in each range States is presented in Table 9 and Annex 3.

Table 9. Status of *Manis gigantea* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Angola	No information	*Presence uncertain
Benin		*Presence uncertain. Last recorded in 2013 (see Annex 3).
Burkina Faso	No information	*Presence uncertain
Cameroon	Population likely in precipitous decline; considered rare to abundant throughout the country (WA BiCC, 2020)	*Based on the availability of suitable habitat, likely is, or was, widely distributed (Annex 3).
Central African Republic	Population is declining and likely increasingly rare (WA BiCC, 2020)	*Based on the availability of suitable habitat, likely is, or was, widely distributed (Annex 3).
Congo	No information	
Côte d'Ivoire	Data Deficient (2021/016); Population likely declining (WA BiCC, 2020).	
DRC	Population variably described as stable to in precipitous decline (WA BiCC, 2020).	
Equatorial Guinea	No information	*Based on the availability of suitable habitat, likely is, or was, widely distributed (Annex 3).

Gabon	Population likely declining, even precipitously at some sites, though not uncommon (WA BiCC, 2020).	
Ghana	Status uncertain. Last recorded in the early 2000s. If present, likely rare and in precipitous decline (WA BiCC, 2020).	
Guinea	Population likely declining precipitously, though potentially not uncommon (WA BiCC, 2020)	
Guinea-Bissau	No information	
Kenya	No information	
Liberia	Population likely declining, though potentially not uncommon (WA BiCC, 2020).	
Mali	No information	*Species is likely to be present in southwestern Mali (see Annex 3).
Niger	No information	*Presence uncertain
Nigeria	Data Deficient (2021/016); Likely extinct in the wild (WA BiCC, 2020).	
Rwanda	Believed extinct until presence recently confirmed in Akagera National Park.	
Senegal	No information	*Presence uncertain
Sierra Leone	Population likely declining, and it is uncommon around the country.	
South Sudan	No information	*Species presence confirmed in southwest Sudan (see Annex 3).
Togo	No information	*Presence uncertain, though the species was thought to be present historically (see Annex 3).
Uganda	CITES Management Authority has indicated in 2016 a population of 2000 individuals and densities of up to 0.03 individuals/km^2 (CITES, 2016).	*Assessed as Endangered nationally in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).
United Republic of Tanzania	No information	

4.2.4 *Manis temminckii*

Little is known about the abundance of this species across most of its range, though one exception is South Africa (Table 10). Here, the species is severely threatened by electrified fences within South Africa, with an estimated 377–1,028 individuals electrocuted per year, in addition to local and international bushmeat and traditional medicine trades; since 2010, the number of seizures per year at ports has increased from two in 2000 to 40 in 2013 (Pietersen et al., 2016). Information on status in each range State is presented in Table 10 and Annex 3.

Table 10. Status of *Manis temminckii* in range States. Population trend information is based on responses to Notification to the Parties numbers 2021/016, 2017/035, or 2014/059 or other sources as indicated.

Range State	Inferred population trend for last 5 years (report date and notification number or other source in parentheses)	Other key information on status
Angola	No information	
Botswana	Data Deficient (2021/016)	*Based on the availability of suitable habitat, likely widely distributed (Annex 3).
Burundi	No information	
Central African Republic	No information	
Chad	No information	
DRC	No information	
eSwatini	Species considered extirpated (Pietersen et al., 2016).	
Ethiopia	No information	
Kenya	No information	*Widely distributed in the country but absent from east and northeast regions (Annex 3).
Malawi	No information	*Believed to occur throughout the country (Annex 3).
Mozambique	Data Deficient (2021/016) though the CITES Management Authority determined that the species is likely declining (see Annex 3).	
Namibia	Population increasing (2021/016)	

Rwanda	No information	*Widely distributed, but seemingly absent from the east and northeast regions (Annex 3).
South Africa	Mature population size estimated at 7002–32,135, with a most likely estimate of 16,239–24,102 individuals (Pietersen et al., 2016).	*Assessed as Vulnerable in southern Africa (South Africa, Swaziland and Lesotho) in 2016 (Pietersen et al., 2016).
South Sudan	No information	*Widely distributed but absent from the east and northeast regions (Annex 3).
Sudan	No information	*In correspondence with the Sudan CITES Management Authority they stated that Sudan is not a range State. However, this species has been historically recorded from Kadugli in the Nuba Mountains (Sweeney, 1956, 1974) and been collected in the Sennar region, close to the Ethiopian border (Yalden et al., 1996).
Uganda	No recent information	*Assessed as Vulnerable nationally in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).
United Republic of Tanzania	No information	*Thought to be widely distributed (Annex 3).
Zambia	No information	
Zimbabwe	Population likely stable but may be declining (2021/016).	

5. Legal and illegal trade in pangolins

5.1 Legal trade

International trade in African pangolins and their derivatives for commercial and other purposes was permitted up until January 2017, after which time all eight pangolin species were included in Appendix I. In the period 2000–2017, there were zero export quotas for wild caught specimens of all Asian pangolin species traded for commercial purposes. Throughout this period, and including up to 2018 (the period with data available and of concern to this report), pangolins and their derivatives could be traded legally for a variety of other non-commercial purposes, including as scientific specimens.

There were small volumes of trade in Asian pangolins in the period 2014–2018 but comparatively higher volumes involving African pangolins. Trade involved a range of derivatives including scales, live animals, and scientific specimens (Annexes 4 and 5). Most trade in African pangolins involved scales, including the equivalent of an estimated ~21,000 *M. tricuspis* and close to 6000 *M. gigantea*, which were collectively traded from Burundi, Congo, DRC, and Uganda to China and Hong Kong SAR in the period 2014–2017. Overall, the volumes of trade in pangolins reported to CITES in the period 2014–2018 were small compared to volumes of illegal trade in the period 2016–2020, which were substantially larger and involved many countries and trade routes and likely all species of pangolin (Section 5.2). The overlap between these two time periods reflects the fact that different datasets were analysed over five-year periods; seizure data were available for the period 2016–2020 but at the time of download data from the CITES Trade Database were only available for 2014–2018. Trade in Asian and African pangolins and each species is discussed below.

5.1.1 Asian pangolins

Asian pangolins were subject to zero export quotas for commercial trade in wild-caught specimens between 2001 (following CoP11) and 2017, when on 2nd January 2017, the four species were formally transferred from Appendix II to I. As may be expected, the transfer of these species from Appendix II to I does not appear to have had a noticeable impact on reported trade levels. In the period 2014–2018 trade volumes were small and involved live animals, scientific specimens, scales, medicine, and other derivatives traded for personal, commercial

and scientific purposes (Annex 4). Legal trade volumes were dwarfed by illegal trade in Asian pangolins in the period 2016–2020 (Section 5.2).

***Manis pentadactyla* –** Direct trade involved small numbers of live animals, scientific specimens, bodies, and medicine. In 2016, two live *M. pentadactyla* were exported from Taiwan Province of China to Germany for captive breeding purposes (purpose code B) using source code W. In 2014, ten scientific specimens were exported from Hong Kong SAR to Singapore for scientific purposes (source code W). In 2018, 1985 units of medicine were exported from Viet Nam to the United States for personal purposes (with source code I); in the same year one unit was exported from China to the United States with the same source code for commercial purposes.

Re-exports involved small numbers of scientific specimens and medicines. Exporter records suggest 36 scientific specimens were re-exported from the United States to Canada (five specimens) and France (31 specimens) with origins of China, India, Lao PDR, Nepal, Taiwan Province of China, Viet Nam and unknown origins. This trade was for scientific purposes and used source code W. Regarding medicine, the United States imported 180 units of medicine and 11,443 g of medicine between 2014 and 2017 from China, Thailand and Viet Nam, for personal or commercial purposes (and using source code I). See Annex 4 for tabulated data.

***Manis javanica* –** Trade in *M. javanica* involved a small number of scientific specimens exported from Singapore to the United States in 2015 and/or 2016 for scientific purposes (Annex 4). Based on exporter records, 145 g of specimens were exported from Singapore to the United Kingdom for scientific purposes in 2017 (using source code F). Re-exports involved small numbers of skins, scientific specimens, scales, garments and carvings mainly for scientific or educational purposes (Annex 4). Importers included Canada, France, Indonesia and the Republic of Korea (Annex 4).

Manis culionensis – Using exporter reported data, re-exports included two scientific specimens exported from the United States to Canada in 2014, and eight specimens exported from the United States to France in 2014 (three specimens) and 2015 (five specimens) which originated in the Philippines, were wild-sourced and traded for scientific purposes (Annex 4).

***Manis crassicaudata* –** Using exporter reported data, in 2014, six specimens were exported from the United States to France for scientific purposes (source code C). Re-exports largely comprised small numbers of specimens traded for scientific purposes in 2014–2015 (Annex 4).

Trade in *Manis* spp. and Manidae spp. from Asian pangolin range States – Direct trade in *Manis* spp. from Asian pangolin range States involved small quantities of scales, medicine, and reportedly small fur products (Annex 4). As an example, in 2015, 27.8 kg of scales were exported from Hong Kong SAR to South Africa for scientific purposes (source code U). The United States was the only importer of medicine between 2014 and 2018 based on importer reported data. During this period the United States imported 2,107 units and 1,980 ml of medicine from China, Indonesia, and Viet Nam collectively, for personal purposes (using source code I). Trade in Manidae spp. involved the export of 14.8 kg of scales from Hong Kong SAR to South Africa in 2017 for law enforcement purposes (using source code I). See Annex 4 for tabulated data.

5.1.2 African pangolins

Trade in African pangolins between 2014 and 2018 involved live animals, scales, bodies, scientific specimens, skins, and skin pieces, among other derivatives (Annex 5). The majority of trade in EWP involved scales from *M. tricuspis* and *M. gigantea* between 2014 and 2017 as discussed below. An impact of the transfer of African pangolins from Appendix II to I is that international trade authorised by CITES authorities has ceased but is continuing illegally. In the period 2014–2017 there were substantial volumes of commercial trade in scales reported to CITES, especially from West and Central Africa to China and Hong Kong SAR. No such trade was reported for 2018 while data for 2019 and 2020 were not available at the time of download. Critically, volumes of legal trade in African pangolins reported to CITES in the period 2014–2018 is dwarfed by illegal trade in the period 2016–2020, indicating that the harvest of African pangolins for international trade continues illegally (Section 5.2).

***Manis tricuspis* –** Trade in *M. tricuspis* predominantly involved scales, live animals, and specimens (Annex 5). Based on importer reported quantities, trade in scales involved 7,450 kg (20,666 EWP) between 2014 and 2017 all of which were imported to China. This includes 750 kg (2,081 EWP) of scales in 2014 and 200 kg (555 EWP) in 2015 from DRC, and 1000 kg (2,774 EWP) in 2015, 500 kg in 2016 (1,387 EWP), and 5000 kg (13,870 EWP) in 2017 from

Congo. All of this trade took place for commercial purposes using source code W. Other trade in scales involved much small quantities (i.e., <300 scales) exported from Liberia to Germany, Central African Republic to South Africa, and Gabon to France between 2014 and 2016 for scientific purposes. See Annex 5 for other trade records.

Regarding live animals, based on importer records China imported 200 live wild-caught *M. tricuspis* from Nigeria for captive breeding purposes in 2015. The United States imported 17 wild-caught animals from Togo in 2015—though the exporter reported quantity is 22—traded for commercial purposes. The United States also imported 46 wild-caught live animals from Togo in 2016 traded for zoological purposes. Exporter records suggest additional wild-caught, live animals were exported in the period 2014–2016. This includes the export from Togo of 70 animals in 2014 in various quantities to the United States, China, Japan, Oman, and Malaysia. It also includes the export from Togo in 2015 and 2016 of 61 live animals traded for commercial purposes to the United States and Japan. Further, it includes the export of 11 live animals from Benin to the United Kingdom in 2016 for commercial purposes (source code W).

Based on importer reported quantities, 644 specimens were imported between 2014 and 2019. This involved 450 scientific specimens exported from Central Africa Republic to Germany, and 100 scientific specimens from Côte d'Ivoire to Germany in 2019, which involved wild-caught specimens traded for scientific purposes. In 2018, the Czech Republic imported 42 scientific specimens from Congo that were wild-caught and traded for scientific purposes. The remaining trade involved 20 or less scientific specimens traded between importers comprising France, Germany and South Africa, and exporters including Central African Republic, Côte d'Ivoire, France, Liberia and Nigeria. The majority of this trade involved wild-caught specimens traded for scientific purposes.

Other trade involved skins and skin pieces in very small quantities (Annex 5). Similarly, re-exports involved small number of scientific specimens (Annex 5).

***Manis tetradactyla* –** Trade in *M. tetradactyla* involved live animals, scientific specimens, skins, and scales (Annex 5). Based on importer reported quantities, China imported 200 live, wild-caught animals from Nigeria in 2015 for captive breeding purposes. Based on exporter records, the Czech Republic imported five live animals from Togo in 2015 and one live animal

from Benin in 2016. It is worth noting that this species is not known to occur in the wild in either Benin or Togo, thus the species identification and/or the wild origin of these specimens is questionable. These exports were for commercial purposes.

Between 2014 and 2019, 468 scientific specimens were traded (purpose code S) based on importer reported quantities. Germany imported 450 specimens from Central African Republic in 2019 (source code W). In 2015, South Africa imported four specimens from France (source unknown), and France imported 13 specimens from Côte d'Ivoire (source code W). In 2018, Malaysia imported a small quantity of specimens from South Africa, reportedly from a captive source (source code C). Other trade and re-exports are presented in Annex 5.

***Manis gigantea* –** Trade in *M. gigantea* involved scales, live animals and skins among other derivatives (Annex 5). Trade in scales involved 21,424.7 kg (5,952 EWP) between 2014 and 2017 based on importer reported quantities, for commercial purposes and using source code W. Uganda exported 7,198 kg (2000 EWP) of scales to China in 2014 (3198 kg) and 2016 (4000 kg - though Uganda reported only 1000 kg [278 EWP]). Burundi exported 6,521 kg (1812 EWP) to Hong Kong SAR in 2016 and 7,705.7 kg (2141 EWP) in 2017. It is worth noting that this species is not known to occur in the wild in Burundi, thus the species identification and/or the wild origin of these specimens is questionable. Based on exporter reported quantities Uganda exported 99 kg of scales to Malaysia in 2014 and the same quantity to Lao PDR in 2016. Other trade involved smaller quantities of scales (Annex 5).

Based on importer reported quantities, the trade in live animals involved the import by China of 100 animals in 2015 from Nigeria (source code W) for captive breeding purposes (source code B). Regarding skins, Uganda reported the export of 3,000 kg of *M. gigantea* skins (source code W) to China in 2016 for commercial purposes.

Re-exports involved skins and small leather products. Based on exporter reported quantities, this involved 50 skins re-exported from Mexico to Denmark in 2014, with an origin of Togo. It also involved 200 skins exported from Togo to the United States (origin unknown) in 2014. All these skins were traded for commercial purposes using source code W. Trade in leather products involved smaller trade volumes (Annex 5).

***Manis temminckii* –** There was comparatively little trade in *M. temminckii*. This included the export of one live animal from South Africa to DRC in 2017 for zoological purposes using source code R. Other trade included two bodies that were exported to China from South Africa for educational purposes in 2014 (source code W). Other trade, including re-exports, is presented in Annex 5.

Trade in *Manis* spp. from African pangolin range States – Trade in *Manis* spp. from African pangolin range States involved small numbers of live animals, meat, scales, bodies and scientific specimens (Annex 5). This included 10 live animals exported from Benin to the United States in 2014 for commercial purposes (using source code W) based on exporter reported quantities. It also included the import by the United States of two bodies, one from Cameroon in 2015 and one from Liberia in 2017 for commercial and personal purposes, respectively (source code I). The trade in meat included 13 units imported by the United States from Cameroon (3), Nigeria (2), and Togo (8) between 2014 and 2017. This trade was for commercial purposes and is recorded in the CITES trade database with source code I. Trade in scales involved the export of 750 kg of scales (2081 EWP) from DRC to China to 2015 for commercial purposes (source code W). Other trade involved small quantities of scales and specimens (Annex 5).

Trade in *Manis* spp. not from pangolin range States – Direct trade in *Manis* spp. not from pangolin range States involved meat and small leather products. In 2017, 2 kg of meat was imported to the United States from France for personal purposes and is recorded in the CITES trade database with source code I. In 2017 and 2018 small quantities of leather products were exported from Mexico to the United States for personal purposes (source code I). Re-exports included small quantities of various derivatives (Annex 5).

5.2 Illegal trade

Based on responses to Notification to the Parties No. 2021/016, 15 out of 17 Parties reported that illegal trade in pangolins occurs in the country. This included the following pangolin range States: Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Mozambique, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe, as well as Japan, New Zealand, and the United Kingdom. Information on seizures involving these countries and associated trade routes is discussed in Section 5.2.1, but Parties that responded to the questionnaire characterised their

role in illegal pangolin trade as described in the following paragraphs, starting with Asian range States and then African range States. The Gambia and Slovakia reported that illegal trade in pangolins does not occur in the countries.

India reported that pangolins are poached in the country mainly for illegal international trade to East and South-East Asia, with transit mainly through Bhutan, Nepal, and Myanmar. India further reported that while there may be some illegal, local consumption of pangolins, it is unlikely to be a significant driver of poaching. Bangladesh and Thailand reported that they are countries of origin for illegal trade as well as transit, and Singapore reported that it is a transit country for illegal pangolin trade in Southeast Asia. Bangladesh reported that it is a country of origin and transit for pangolins traded illegally. Indonesia reported that it is a country of origin for pangolins trafficked to China and Viet Nam, with illegal trade routes including Hong Kong SAR, Lao People's Democratic Republic, Malaysia, and Thailand. China reported that it is a destination country for illegal trade in pangolins.

Botswana reported that it is an origin of pangolins in illegal trade and that, in most cases, local people hunt pangolins in order to trade in them illegally with Asian nationals. Mozambique reported that pangolins are sourced from both protected and non-protected areas in the country and are trafficked internationally using various routes. This includes from Mozambique to Zimbabwe, and seizures are also made at airports and ports. Mozambique also reported that there have been instances of pangolin parts being sold in a restaurant run by Chinese citizens in the country. Nigeria reported that illegal trade takes place in the country and that it is coordinating all relevant stakeholders to intercept consignments of pangolins possessed illegally at ports and border posts and is prosecuting individuals if they are apprehended. Côte d'Ivoire reported that it is a country of origin and transit for pangolins traded illegally. The Gambia reported that the extent of illegal, international trade involving pangolins is difficult to determine because CITES Scientific and Management Authorities are not present at the borders where trafficking is suspected to take place at high levels, suggesting that a lack of cooperation between law enforcement agencies is a problem (see Section 8).

Beyond range States, New Zealand reported that parts and/or derivatives of pangolins are occasionally seized at the border being traded without correct permits. These are primarily personal effects and are typically found due to New Zealand's strict border measures for

personal and household effects. The United Kingdom reported that a small number of seizures involving pangolin scales have been made at the border, which have mostly been in transit from Africa to Southeast Asia. A pangolin carcass was seized in early 2020, which was being imported to the United Kingdom from Ghana. Further seizures of products have included incense sticks with pangolin listed as an ingredient (usually shown as "NAGI" in the ingredient list), which are typically from Nepal or the Tibet Autonomous Region of China. Pangolin derivatives have also been found in trade within the United Kingdom, including the recovery of scales during a search at premises concerned with traditional medicines. Japan reported it is a destination for pangolin derivatives sent through the post. Slovakia reported that illegal pangolin trade does not occur in the country.

Fifteen countries that responded to the questionnaire reported that illegal trade in pangolins and/or their derivatives on the internet is not common. This includes Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe, as well as non-range States Japan, Slovakia, New Zealand, and the United Kingdom

Of countries responding to Notification to the Parties No. 2021/016, most reported that seizures involving pangolin specimens were made in the period 2016–2020. This included Bangladesh, Botswana, China, Côte d'Ivoire, India, Indonesia, Mozambique, Namibia, Nigeria, Singapore, Thailand, and Zimbabwe, as well as non-range States Japan, New Zealand, and the United Kingdom. Illegal trade is discussed in more detail in Section 5.2.1. However, evident from that section is that the identification of pangolins to species level remains challenging for frontline law enforcement agencies as most seizures were reported to involve *Manis* spp. (i.e., specimens were not identified to species level). This precludes accurate assessment of trade involving individual species and subsequent assessment of the impact of harvest for trade (locally, nationally, and internationally) on wild populations. While Indonesia, Slovakia, and the United Kingdom reported that available identification materials for pangolin specimens, such as USAID's Pangolin Species Identification Guide, to be adequate, Bangladesh, Botswana, India, Mozambique, and Namibia highlighted that currently available identification materials are inadequate or can be improved upon. The Bangladeshi Forest Department is reportedly currently working with the country's law enforcement to prepare an identification guide for pangolins. Indonesia has also developed an identification guide on pangolins for use in the country. Mozambique reported it has not received any materials to identify pangolin parts. It

also noted that those individuals and organisations that have received identification materials have stated that they do not explain how to identify different species or how to age pangolins. Côte d'Ivoire reported a lack of identification material and Japan highlighted that materials to distinguish between different pangolin species in order to aid implementation of national legislation would be helpful.

Singapore noted that The Centre for Wildlife Forensics, launched by the National Parks Board in August 2020, has boosted in-house detection and diagnostic capabilities to identify and analyse pangolin species and their derivatives. Previously, the USAID Pangolin Species Identification Guide was used to identify different species from seized pangolin scales. Reference samples of scales from past seizures are stored in the aforementioned Centre.

The following sections discuss illegal trade in pangolins and their derivatives. Sections 5.2.1 and 5.2.2 discuss data provided by the CITES Secretariat, UNODC, and Parties to CITES, while section 5.2.3 discusses illegal trade based on information from other sources.

5.2.1 Parts and derivatives in illegal trade

Between 2016 and 2020, there were 955 seizures involving pangolins or their derivatives that took place in 33 countries: Bangladesh, Belgium, Botswana, Côte d'Ivoire, Czech Republic, DRC, France, Germany, India, Indonesia, Japan, Lao People's Democratic Republic, Malawi, Malaysia, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nigeria, Pakistan, Philippines, Poland, Singapore, South Africa, Spain, Switzerland, Thailand, United Kingdom, United States, Viet Nam, and Zimbabwe (Table 11, Fig. 1). This involved an estimated 258,466 pangolins traded illegally in the form of scales, individuals (including live animals, bodies and skins), meat, medicines, and other derivatives.

Of this illegal trade (as reported by CITES Secretariat, UNODC, and Parties to CITES), 98% (254,107 EWP) involved scales, and of illegal trade in scales, 95% (240,300 EWP) can be accounted for by 20 seizures that took place in Côte d'Ivoire, Malaysia, Singapore, Thailand, and Viet Nam between 2017 and 2019. These seizures involved the equivalent of between 1134 and 35,819 pangolins each (Table 12). The two largest seizures took place in Singapore in 2019 and involved an estimated 35,516 and 35,819 pangolins respectively and had an alleged origin of Nigeria, were being transited through Singapore, and had an alleged destination of Viet Nam

Table 11. Number of seizures, number of seizures by derivative, and EWP pangolins seized in the period 2016–2020, by Party. Scales includes scales and powder. Individuals includes live animals, bodies, and skins. Other comprises other body parts including skulls, trophies, and leather products. *Includes a small number of seizures from 2021. Data source: CITES Parties, UNODC and the CITES Secretariat.

Party	No. seizures	Scales	Individuals	Meat	Medicine	Other	EWP seized
Bangladesh	14		10			4	10
Belgium	25	25					432
Botswana	12		12				12
DRC	13	8	5				191
Côte d'Ivoire	10	6	1	3			11,134
Czech Republic	1				1		1
France	37	11	5	20		1	1299
Germany	1				1		0
Indonesia*	9	7	2				560
India	115	50	60	1	4		997
Japan	2				1	1	0
Lao PDR	3	1	2				19
Malawi	6		6				6
Malaysia	24	16	8				46,699
Mozambique	32	2	30				42
Myanmar	13	10	3				756
Namibia*	225	46	179				249
Nepal	14	10	2			2	214
Netherlands	18	10			8		1039
New Zealand	18	8			9	1	1
Nigeria	1	1					255
Philippines	3		3				65
Pakistan	1	1					200
Poland	1		1				1
Singapore	2	2					71,235
South Africa	39		38				40
Spain	6		6				8
Switzerland	3			3			3
Thailand	60	10	50				13,630
United Kingdom	9	2	2	4		1	3
United States	28	2	3	3	11	9	18
Viet Nam	52	17	28			7	109,233
Zimbabwe	158	30	97			28	114
Total	955	275	582	34	30	34	258,466

(Fig. 2). Based on available information for these 20 seizures, alleged origins included Cameroon, Congo, DRC, Mozambique, Nigeria, and Côte d'Ivoire or Liberia (i.e., there is

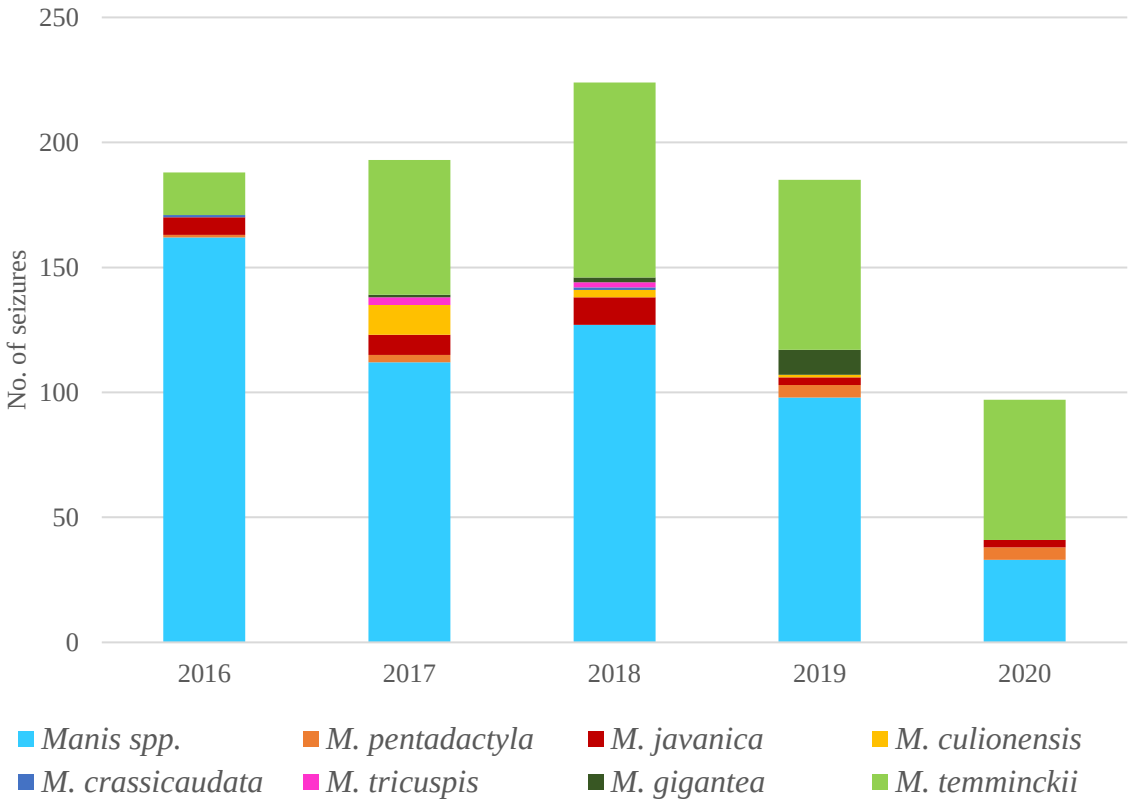

Fig. 1. Number of seizures involving different species of pangolin in the period 2016–2020 based on data from Parties, the CITES Secretariat and UNODC. 2020 includes 11 seizures made in Namibia and 1 seizure made in Indonesia in 2021 respectively. Inherent biases in the data relating to enforcement effort and rates of seizure and reporting (see Challender et al., 2021) have not been accounted for so this chart does not provide meaningful temporal trends in number of seizures.

uncertainty over the alleged origin of some of this illegal trade between Côte d'Ivoire and Liberia) (Table 12). Transit countries reportedly include Malaysia, Singapore, Thailand, and unknown countries, and alleged final destinations comprise China, Lao People's Democratic Republic, and Viet Nam. For 17 of these seizures, they are reported to simply include *Manis* spp., but three seizures reportedly included *M. tricuspis*, collectively involving the equivalent (i.e., EWP) of 38,667 individuals. The reported origins of this illegal trade are Cameroon, Mozambique, and Nigeria, with reported transit countries comprising Malaysia and an alleged final destination of China. Mozambique is likely inaccurate as an alleged origin of scales from *M. tricuspis* because this species does not occur in the country (see Section 4.2.1).

Seizures involving smaller quantities of scales involved 13,807 EWP overall and the equivalent of between 1 and 888 pangolins per seizure (in shipments varying in size from <1 kg to 550

Table 12. The 20 seizures accounting for 95% of illegal trade in scales (2016–2020). Data reported by CITES Secretariat, UNODC, and Parties to CITES. OR=Alleged county of origin, TR=Country of transit, DE=Alleged country of destination.

Country	Year	Species	EWP seized	Quantity Seized (kg)	OR	TR	DE
Malaysia	2017	*M. tricuspis*	22,352	8058	MZ	MY	CN
Malaysia	2017	*M. tricuspis*	14,851	5354	NG		CN
Côte d'Ivoire	2017	*Manis* spp.	8322	3000	CI/LR	XX	CN
Malaysia	2017	*Manis* spp.	5858	2111.85			
Thailand	2017	*Manis* spp.	2957	1066	CD	TH	LA
Thailand	2017	*Manis* spp.	2957	1066	CD	TH	LA
Malaysia	2017	*Manis* spp.	1134	408.85			
Viet Nam	2018	*Manis* spp.	23,023	8300			
Viet Nam	2018	*Manis* spp.	17,570	6334	NG		
Viet Nam	2018	*Manis* spp.	10,457	3770	CG		
Thailand	2018	*Manis* spp.	4022	1450			
Viet Nam	2018	*Manis* spp.	2394	863	NG		
Viet Nam	2018	*M. tricuspis*	1465	528	CM		
Côte d'Ivoire	2018	*Manis* spp.	1598	576	XX	XX	VN
Singapore	2019	*Manis* spp.	35,819	12,913	NG	SG	VN
Singapore	2019	*Manis* spp.	35,416	12,768	NG	SG	VN
Viet Nam	2019	*Manis* spp.	23,023	8300			
Viet Nam	2019	*Manis* spp.	14,600	5264			
Viet Nam	2019	*Manis* spp.	7767	2800			
Viet Nam	2019	*Manis* spp.	4715	1700			

kg) and involved a broader range of countries (Fig. 3). Based on available information, alleged countries of origin include Benin, Côte d'Ivoire, Malaysia, Nigeria, and Senegal, among others.

Reported transit countries include Belgium, France, Malaysia, the Netherlands, and Thailand, among others, and alleged final destinations include China, Hong Kong SAR, Lao People's Democratic Republic, Malaysia, Thailand, and Viet Nam (Fig. 3).

Illegal trade in individual pangolins, including live animals, skins and bodies, involved an estimated 4305 pangolins. 93% of this illegal trade (3777 pangolins) can be accounted for by seizures in six countries: Thailand (1866 animals), Viet Nam (1084 animals), Malaysia (469 animals), Indonesia (231 animals), Namibia (249 animals) and Zimbabwe (109 animals). Between Indonesia, Malaysia, Thailand, and Viet Nam, illegal trade in live animals and bodies took place throughout the period 2016–2020 and involved shipments ranging in size from one animal to 229 pangolins. In the same period 179 seizures were made in Namibia, and 97 in

Zimbabwe, but these seizures typically involved a single pangolin or up to 3 individuals in Zimbabwe and 6 in Namibia. The following countries also made seizures of individual pangolins: Bangladesh (10 individuals), Botswana (12), DRC (5), Côte d'Ivoire (1), Czech Republic (1), France (8), India (63), Lao People's Democratic Republic (9), Myanmar (10), Malawi (6), Mozambique (42), Philippines (65), Poland (1), Spain (80), South Africa (40), United Kingdom (3), and the United States (3).

Illegal trade in meat involved the equivalent of 54 pangolins in total seized in Côte d'Ivoire, France, India, Switzerland, and the United States. They involved quantities of meat ranging from <1–23 kg or the equivalent of 1–8 units of meat, taken here to comprise individual pangolins. Twenty of these seizures took place in France, which was the alleged final destination and alleged countries of origin included Cameroon, Central African Republic, Congo, and Nigeria. However, 12 of these seizures were reported to include *M. culionensis*—native to Palawan, Philippines (Section 4.1.3)—and the identification of the meat as this species is questionable given prevailing trade dynamics and the restricted distribution of *M. culionensis.* The meat seized in Côte d'Ivoire (in three seizures) allegedly originated in the country and had alleged destinations of Burkina Faso, France, and Turkey. Based on available information, one seizure in Switzerland had an alleged destination of Cameroon.

Seizures of medicine took place between 2016 and 2019 in Germany, Japan, the Netherlands, New Zealand, United Kingdom, and the United States involving units ranging from 1–1440. It is unclear from the available information on illegal trade provided whether these numbers reflect individual scales, tablets or similar, or boxes of medicines containing pangolin derivatives. Two seizures made in New Zealand offer an insight; they included 3 packets of traditional Chinese medicine (containing a total 60x tablets) and 10 bottles of traditional Chinese medicine respectively. Based on available information, alleged countries of origin included Australia, China, Hong Kong SAR, Nepal and Turkey and alleged final destinations of Germany, Japan, the Netherlands, New Zealand, and the United Kingdom.

Other illegal trade involved hair, small leather products, skulls, and trophies in small numbers. It includes the reported seizure of 392 *Manis* spp. skulls in Nepal in 2016. Zimbabwe reported the seizure of 31 trophies in 26 seizures between 2016 and 2020.

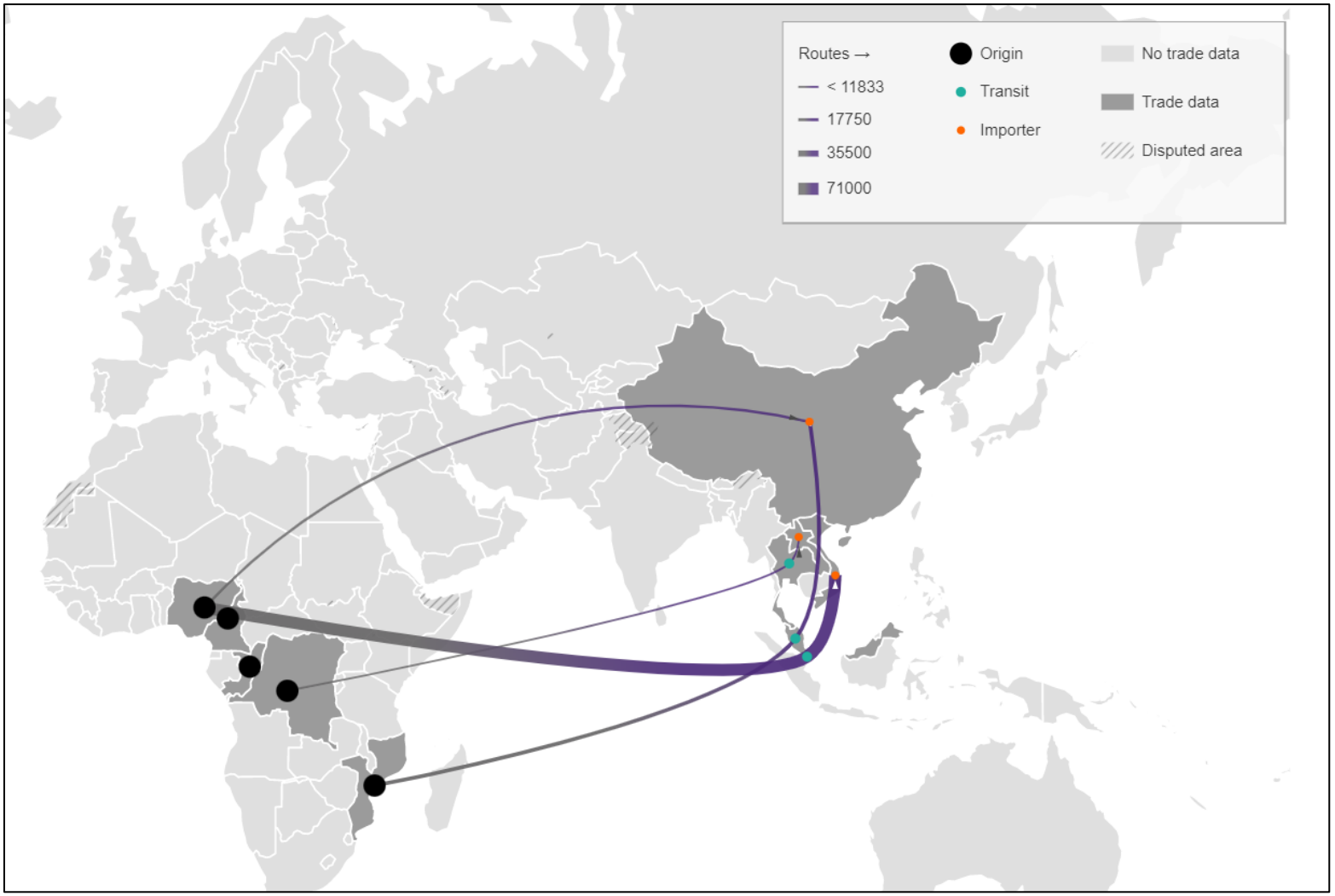

Fig. 2. Illegal trade routes for pangolin scales involving >1000 EWP between 2016 and 2020 based on available seizure data provided by Parties, the CITES Secretariat and UNODC. Map made with TRAFFIC's TradeMapper

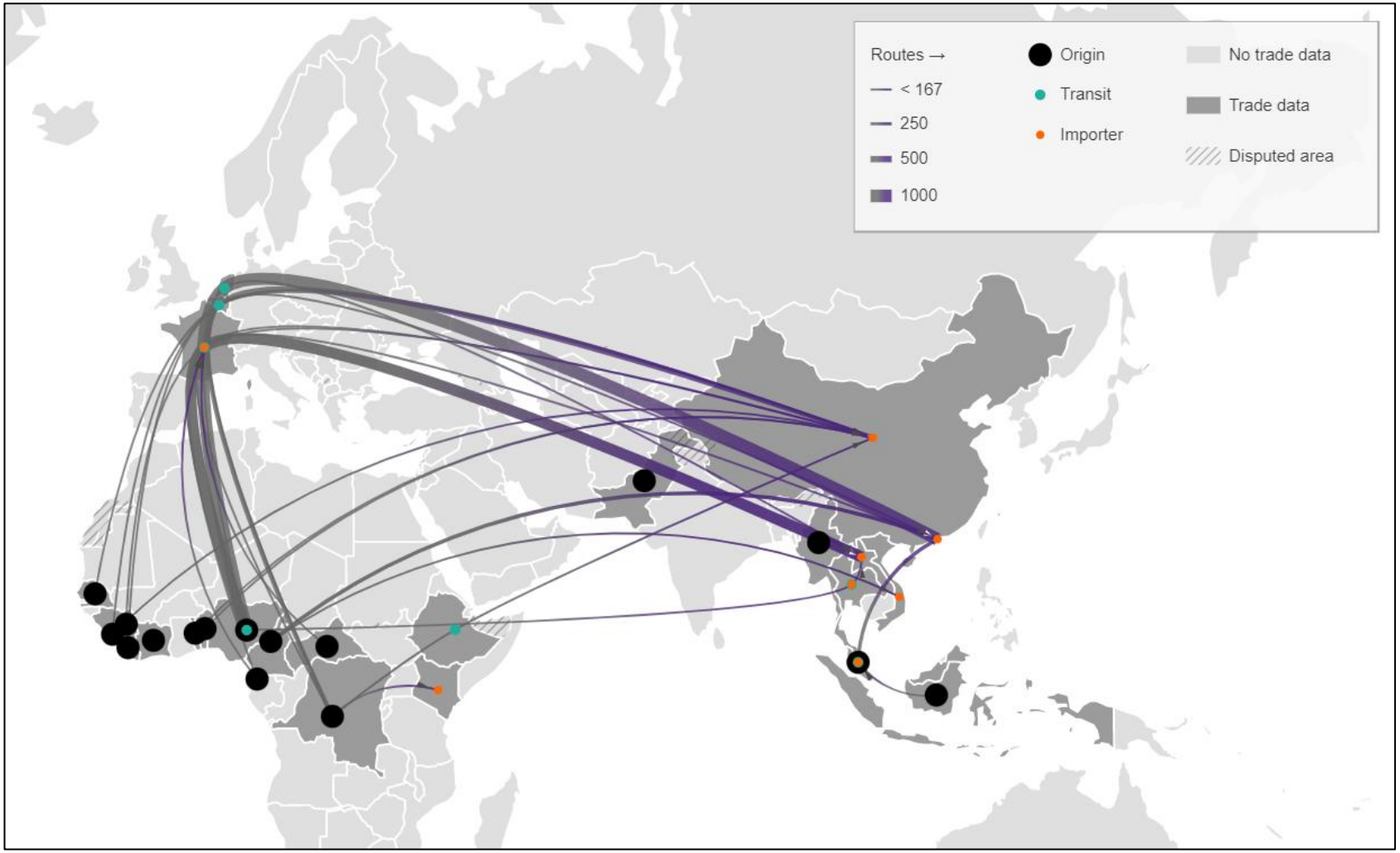

Fig. 3. Illegal trade routes for pangolin scales involving <1000 EWP between 2016 and 2020 based on available seizure data provided by Parties, the CITES Secretariat and UNODC. Map made with TRAFFIC's TradeMapper.

5.2.2 Species in illegal trade

Of the 955 seizures that were made between 2016 and early 2021, 60% (575 seizures) were reported to include *Manis* spp. (Fig. 1), i.e., the species involved were not recorded. This impedes accurate quantification of illegal trade volumes involving the different pangolin species and therefore subsequent evaluation of the impact exploitation for illegal trade at the international level has on wild populations. Given knowledge gaps around the harvest of pangolins for local and national (i.e., domestic) use and international trade, in particular how harvesters, legal trade actors, and illegal trade networks, operate and how harvest relates to the different levels of use and trade—legal and/or illegal—the lack of accurate recording and reporting of the different pangolin species in illegal trade precludes a holistic understanding of the impact of harvest for use and trade at all levels. Below, illegal trade involving *Manis* spp. is summarised before that involving particular species.

***Manis* spp.** – A total of 575 seizures between 2016 and 2020 were reported to include *Manis* spp. involving an estimated 216,984 pangolins. 98% of this illegal trade can be accounted for by seizures of scales, and of this, 95% can be accounted for by seizures involving the EWP of >1000 animals (see Section 5.2.1). Seizures of illegal trade in scales were made in Belgium (20), Côte d'Ivoire (7), France (8), India (48), Lao People's Democratic Republic (1), Malaysia (5), Myanmar (10), Nepal (10), Netherlands (10), New Zealand (7), Nigeria (3), Singapore (2), Thailand (9), United Kingdom (2), United States (2), Vietnam (16) and Zimbabwe (30).

Trade in particular species is discussed below. It should be noted that these figures rely on accurate identification of the different pangolin species by law enforcement agencies and which may or may not have been verified and therefore may not be accurate.

***Manis pentadactyla* –** 19 seizures were reported to involve *M. pentadactyla*, including individuals (live animals and bodies) and medicines. This included 19 individuals seized in Bangladesh, India, and Thailand and two seizures of medicine (24 and 80 units, respectively) made in the United States that originated from Viet Nam and Thailand, respectively.

***Manis javanica* –** 31 seizures reportedly involved *M. javanica* and the equivalent of an estimated 903 individuals. Most of this illegal trade can be accounted for by 11 seizures of 1.7–117.8 kg of scales in Malaysia (9 seizures) and Indonesia (2 seizures). Illegal trade in this

species otherwise involved 284 live animals or bodies seized in Malaysia (72 animals), Thailand (144 animals), and Vietnam (68 animals).

Manis culionensis – 16 seizures reportedly involved *M. culionensis*. One seizure took place in Tagaytay City, Cavite, the Philippines in 2019 that involved a live animal. The other 15 seizures all took place at airports in France, were seized by French Customs, and involved scales (ranging from a single scale to 320 kg of scales) and meat (ranging from 1–21.3 kg per seizure). Based on illegal trade data provided by UNODC, all of these seizures had alleged origins of Cameroon, Central African Republic, DRC or Nigeria, and an alleged final destination of France, Hong Kong SAR, Lao PDR, or Switzerland. The alleged origins of these shipments raise doubt about the species involved. Given the limited geographic distribution of *M. culionensis* to a small part of the Philippines, it seems unlikely that these seizures involved this species and it is more likely that they involved one or more pangolin species native to West and Central Africa misidentified as *M. culionensis*.

Manis crassicaudata – 12 seizures are reported to have involved *M. crassicaudata* and the equivalent of 354 individuals. Three seizures, one involving 200 kg of scales in Pakistan and two involving 130 kg and 15.7 kg of scales in India, equating to an estimated 346 individuals, comprised the bulk of this illegal trade. Other illegal trade involved the seizure of 8 live animals or skins in 8 seizures in India.

***Manis tricuspis* –** There were five seizures reportedly involving *M. tricuspis*, which took place in 2017–2018. Four of these seizures involved scales. Malaysia reported two seizures in 2017 of 5,354 kg (EWP = 14,851) and 8,058 kg of scales (EWP = 22,352) (Table 4). In 2018, Viet Nam seized 528 kg of scales (EWP = 1,465 individuals) at Hai Phong; the shipment was mis-declared and had an alleged origin of Cameroon. Thailand seized 27 kg in 2017 that had an alleged origin of Nigeria and an alleged final destination of Lao PDR. The United Kingdom seized a frozen body in 2018.

***Manis tetradactyla* –** There were no seizures reportedly involving *M. tetradactyla*, but information from other sources (see Section 5.2.3) indicates that this species is trafficked illegally from Africa to Asia.

***Manis gigantea* –** Thirteen seizures involving *M. gigantea* were reported by DRC and involved scales and live animals. Eight seizures involving scales were made between 2017 and 2019 involving 669 kg of scales (186 EWP). The majority of this illegal trade can be accounted for by one seizure in Kinshasa in 2019 of 550 kg of scales (153 EWP). The Police Nationale Congolaise seized the scales, which were to be illegally traded by air freight and had an alleged origin of DRC and an alleged destination of Kenya. Other seizures involved smaller quantities of scales (1–96 kg). The seizure of 96 kg of scales was to be traded illegally by air; the scales allegedly originated in DRC and were to be transited via Ethiopia with an alleged final destination of China. DRC also seized five live animals in five seizures, which were detected by the Parc National de la Garamba in Aba, Boh, Durbar (two seizures), and Djabir.

***Manis temminckii* –** Illegal trade in *M. temminckii* involved skins, live animals, bodies, scales, skin pieces and trophies between 2017 and 2020 based on 284 seizures. Seizures involving this species have been reported to species level more so than illegal trade in other pangolin species (Fig. 1). This likely reflects the fact that this species is the only species of pangolin found in parts of its range, especially in southern Africa, making it easy for law enforcement agents to identify. Despite the number of seizures, levels of illegal trade in *M. temminckii* are low compared to the likely levels of trade in other species (see Sections 5.2.2 and 5.2.3). In total, trade in *M. temminckii* involved 318 animals. Most of this illegal trade can be accounted for by seized skins in Namibia. This involved 215 skins in 149 seizures between 2017 and early 2021; most seizures involved just one skin though others involved up to six skins. The trade in live animals involved 100 individuals seized in Malawi (6 animals), Mozambique (42), Namibia (33), and South Africa (19). Based on available data it appears that this trade may not have been international, or at least not intercontinental, though on six occasions live animals had been transported from Mozambique to Malawi.

Trade in *M. temminckii* also involved three bodies, scales, and skin pieces. One body was seized in Namibia in 2016 and one in South Africa in 2018. A body was also seized in a retail premises in Perigueux, France in 2019. Namibia reported a relatively large number (47) of seizures involving small numbers of scales (i.e., 1–4 scales) between 2016 and 2020. South Africa reported the seizure of 2 kg of skin pieces in 2016 made in Vrede.

5.2.3 Information from other sources

The above analyses indicate that levels of illegal trade between 2016 and 2020 dwarf levels of international trade reported to CITES post-2014. Information from other sources (e.g., academic literature drawing on global news, agency and NGO reports as data sources), suggest that levels of illegal, international trade are even higher than suggested above. Challender et al. (2020b) estimated that between August 2000 and July 2019 global trafficking of pangolins involved the equivalent of 895,000 animals and primarily comprised scales. This is based on 1474 seizures made in this period. Importantly, Challender et al. (2020b) estimated that this illegal trade involved the equivalent of ~600,000 pangolins between 2016 and 2019 (i.e., looking at a shorter period), of which 585,000 comprised African pangolins. The majority of this illegal trade—equivalent to an estimated 544,000 pangolins—was inferred to involve *M. tricuspis* and *M. tetradactyla*. Despite *M. tetradactyla* not being recorded specifically in seizure data analysed in Section 5.2, both Challender et al. (2020b) and Ewart et al. (2021), which used DNA analyses to examine species composition in large seizures of scales, confirmed the presence of this species in illegal, international trade. However, as discussed above, many reports of seizures discussed in Challender et al. (2020b) simply referred to *Manis* spp., thereby precluding an accurate understanding of the magnitude of illegal trade involving the different pangolin species. Assuming the reported countries of origin and export are accurate in Challender et al. (2020) (i.e., the origins and exporting countries of illegal, international trade), the primary exporters of scales between 2016 and 2019 were Cameroon, Congo, DRC, Ghana, Nigeria, and Uganda. Burkina Faso, Côte d'Ivoire, and Liberia were also reported as exporters (Challender et al., 2020b). In Section 5.2 seizures are reported to have taken place in 33 countries but illegal trade in pangolins involved many more countries. Challender et al. (2020b) estimated that it involved 55 countries, including 17 of the 19 Asian pangolin range States and 25 of the 36 African pangolin range States; Heinrich et al. (2017) estimated that global trafficking of pangolins involved at least 67 countries.

Emogor et al. (2021) characterised Nigeria's involvement in global pangolin trafficking between January 2010 and September 2021. They estimated that 77 seizures linked to Nigeria in this period involved 190,407 kg of pangolin derivatives—virtually all of which comprised scales—from a minimum of 799,343 pangolins (95% confidence interval: 625,944–996,353). All of the shipments confiscated in transit in Nigeria were destined for Asian markets

(Cambodia, China, and Lao People's Democratic Republic) and were trafficked by air, land, and sea; 65% of the total mass seized (123,636 kg) was trafficked by sea.

In addition to a lack of recording which species in pangolin are involved in seizures, there remains a lack of knowledge on the extent to which harvest of pangolins for local and domestic use is connected to, or not, international trafficking. For instance, Ingram et al. (2018) estimated that 0.4–2.7 million pangolins are harvested annually in Central Africa. The extent to which this offtake is for local or domestic use rather than international trafficking or contributes to both is unknown. It is known than local communities play a role in illegal trade (e.g., as harvesters; see CoP18 Doc. 34 Annex 4), but whether offtake for international trafficking is distinct from that for use and trade domestically requires further investigation, including how and whether these dynamics change spatially and temporally. For example, Mambeya et al. (2018) suggested that an emerging illegal international trade from Gabon appeared to be using trafficking chains distinct from local and domestic wild meat trade chains.

6. Disposal of specimens

The questionnaire attached to Notification to the Parties No. 2021/016 contained questions on the disposal of pangolin specimens. Responses from Parties are summarised below and full responses are available in Annexes 6 and 7.

Standard Operating Procedures

Of the Parties that responded to Notification to the Parties 2021/016, eight reported that they have Standard Operating Procedures (SOPs) in place for managing, storing, and disposing of confiscated pangolin specimens. They include China, Japan, Namibia, Nigeria, Singapore, Thailand, United Kingdom, and Zimbabwe. Pangolin range States are discussed first.

China reported that the Pangolin Conservation and Research Centre of the National Forestry and Grassland Administration was established in July 2020 by the Chinese government. The centre is responsible for rescuing injured or confiscated live pangolins. China further reported that there are also a number of local special agencies for wildlife reception and rescue. In Singapore seized pangolin specimens are ultimately incinerated but are stored at the National Parks' secure facility and escorted by law enforcement agencies when being transported and during forensic investigation and sample collection. In Thailand, live pangolins are sent to the wildlife rescue centres under the Department of National Parks (National Parks, Wildlife and Plant Conservation Department). Seized scales are stored in a safe place by the Department of National Parks, and any meat or carcasses are destroyed.

In Nigeria, the SOP has resulted in the establishment of a seizure committee to oversee the management of seizures including forensic investigation, secure storage, and stakeholder engagement. Seized specimens are marked in accordance with national law and international standards. Namibia and Zimbabwe stated that they have SOPs in place but did not provide any further information on these procedures. Namibia is also in the process of developing an SOP for the handling of seized live pangolins. Mozambique noted that it did not have a national SOP, but highlighted that each management area has adopted its own operational procedures for the handling of confiscated live or dead animals. This may variously involve: (1) checking the health status of animals, (2) keeping any pangolins in a well-controlled boma until animals have recovered, and (3) releasing the animals into the wild. Some animals are sent to

Gorongosa National Park. Final steps include notifying the police, recording details of the seizure, and storing all evidence. Cadavers are buried.

In the United Kingdom, seizures of pangolins are managed in accordance with the Border Force assured standard operating procedures for housing and disposal of all live CITES specimens seized at the United Kingdom border. In Japan, pangolin specimens would be disposed of in cooperation with customs and related organizations, implementing Article VIII 4 (b) of the Convention.

Nine Parties reported that they do not have SOPs in place for managing, storing, and disposing of confiscated pangolin specimens, including Bangladesh, Botswana, Côte d'Ivoire, The Gambia, India, Indonesia, Mozambique, New Zealand, and Slovakia. New Zealand has generic procedures for the management of seized items but not specifically for pangolin specimens given the rarity in which they are encountered.

Based on responses to Notifications to the Parties (No's 2017/035 and 2014/059), other Parties (both range and non-range States) have established regulations or SOPs for managing, storing, and disposing of confiscated or seized pangolins. Additional range States with SOPs include Benin, Cameroon, China, Gabon, Indonesia, Kenya, Malaysia (Peninsular and Sarawak), Myanmar, Nepal, Pakistan, Philippines, Senegal, Viet Nam, and Zambia. Non-range States include Bulgaria, Italy, Latvia, Netherlands, Spain, United Arab Emirates, and the United States. Full details in CITES SC69 Doc. 57 Annex 1, Table 12.

Disposal of live pangolins

Eleven Parties provided information on the how they dispose of live pangolins and a subset provided details of the number of pangolins that were confiscated and/or released into protected areas or otherwise (Annex 7). In Asia, the procedure in Bangladesh is to release live pangolins into protected areas or place them in publics zoos or safari parks. Of the 10 live pangolins seized by the Wildlife Crime Control Unit (WCCU) of the Bangladesh Forest Department between 2012 and 2020, eight were released back into protected areas. In India, live pangolins may be placed in rescue centres or public zoos for treatment before being returned to the wild. Animals that are released are released in protected or non-protected areas. In Singapore, live pangolins may be returned to the country of origin for release to the wild, release pangolins

into protected areas (if it is a native species – *M. javanica* is the only native species), or as a last resort, animals may be euthanised if the country of origin does not allow repatriation and the above options are not available. There have not been any live pangolins seized in Singapore, but if they were Singapore would follow recommendations in CITES Res Conf 17.8 on *Disposal of illegally traded and confiscated specimens of CITES-listed species*. Thailand reported that it releases pangolins into protected areas or places individuals in designated rescue centres. Between 2016 and 2020, 1083 pangolins survived through seizure to release into protected areas. In Indonesia, live pangolins are released into protected areas or placed in designated rescue centres or public zoos. In China, live pangolins are released into protected areas or placed in designated rescue centres.

In Africa, Botswana stated that seized pangolins are released into protected areas or placed in approved private facilities. It was also stated that it is not possible to evaluate survival rates because animals that are released back into the wild are difficult to monitor. In Côte d'Ivoire live pangolins are typically released into protected areas. Between 2017 and 2020, seven live pangolins were recovered and released into Banco National Park. All these animals were handed to authorities by NGOs or citizens. In the period 2016–2020, Mozambique confiscated 79 live pangolins. It disposes of these animals by returning to the country of origin for release into the wild, releases them into protected areas or non-protected areas, or places them in designated rescue centres or other approved private facilities. Pangolins confiscated in the central region of the country are taken to Gorongosa National Park, which has a pangolin programme and rehabilitates animals. This centre began operating in 2018 and pangolins may also be released into Gorongosa National Park. This does mean that pangolins are poached in one area, confiscated while in transit, and then transported to a facility that can provide them with care before being released, potentially into another area. Mozambique also reported that between 2016 and 2020 it managed 87 dead pangolins that were either caught in snares, killed for illegal trade, or had to be euthanized. Namibia typically releases live pangolins that are confiscated into protected areas. However, there is no information on how many pangolins survive following their release. Whereas there used to be no monitoring of released pangolins, Namibia has started to use tracking devices on seized pangolin subsequently released to monitor their survival. No information was shared on survival rates. Nigeria does not have records of seized live pangolins but indicated that disposal takes the form of placement in designated rescue centres or release into protected areas. Zimbabwe returns live pangolins that

are seized to the country of origin, releases them into protected areas, or places them in designated rescue centres. Between 2016 and 2020, 132 live specimens survived following seizure in the country.

Other Parties that responded to the questionnaire reported not seizing live pangolins. They included The Gambia, Japan, New Zealand, Nigeria, Slovakia, and the United Kingdom. Japan reported that it would return live animals seized to the country of origin or place them in a rescue centre. The United Kingdom noted that if a live specimen was seized, due to the Appendix I listing it would seek advice from the UK CITES Scientific Authority for Fauna (Joint Nature Conservation Committee) as to the best course of action in terms of conservation impact. This may include an attempt to return it to its country of origin (if possible, though unlikely) or placement in an appropriate approved facility in the country, such as a zoo or wildlife park.

Challenges to disposing of confiscated pangolins

Eleven Parties that responded to the questionnaire reported that they had not encountered any challenges in disposing of confiscated pangolin specimens. This includes Bangladesh, China, The Gambia, Japan, Namibia, New Zealand, Nigeria, Singapore, Slovakia, United Kingdom, and Zimbabwe. China reported that that CITES Management Authority is in charge of coordinating the work of all relevant law enforcement agencies which have roles in combating illegal trade in wildlife, including pangolins. Mozambique reported that it has not encountered any particular challenges but highlighted that protected area managers are unsure what procedures they should follow for dead animals and their derivative products. The typical course of action is to destroy the confiscated products locally to avoid them returning into the market. Botswana, Côte d'Ivoire, India, and Thailand did report challenges (though Thailand did not elaborate further). In Botswana, the challenge is identifying suitable release sites. In Côte d'Ivoire, the challenge is that all seizures made by law enforcement agencies are not returned to the relevant management agency for secure storage. Where seized animals and/or derivatives are returned to the management agency they may have decomposed due to inadequate storage. India reported that there is room for improvement in terms of skills and manpower for management and disposal of confiscated pangolin specimens, especially live specimens but did not elaborate further.

7. Stocks and stockpile management

Not all Parties that responded to the Notification to the Parties No. 2021/016 questionnaire, provided information regarding stocks and stockpiles management. As such, the responses summarised below reflect what information was provided. This is followed by presentation of information previously provided by other Parties in response to Notification to the Parties 2017/035 and 2014/059 in order to provide a comprehensive account of pangolin stocks held by Parties.

Stocks and stockpiles

Of the 17 Parties to respond to the questionnaire, 11 reported that stocks, whether containing pangolin scales, skins, or other derivatives, exist (Table 13). Indonesia reported that stocks exist in the country but did not provide further information. The stocks range in size from small numbers of scales or specimens to several tonnes of scales (Table 13). Côte d'Ivoire, Nigeria, Singapore, and Thailand reported possessing stocks of over 1,000 kg of scales (range = 1450–3117 kg). It appears that Côte d'Ivoire has destroyed the same quantity of pangolin scales reported to be held as stocks (see discussion on Disposal of stocks below). China reported that pangolin scale stockpiles should be registered, sealed in a standardized manner, and kept at designated points after verifying the legality of acquisition. Similarly, stockpile from law enforcement should be supervised throughout the process, from confiscation, transfer to preservation. All the reported stocks are recorded as involving *Manis* spp. with the exception of those stocks held by Nigeria, which reportedly comprise *M. tricuspis*. Nigeria is subject to Article XIII procedures, which includes adequate controls of stocks (see CITES SC70 Doc. 27.3.5). Cameroon, Kenya, and Uganda previously reported possessing tonnes of scales (Table 14), which presumably still exist.

Other Parties hold smaller quantities of scales and other derivatives, including skins and taxidermied specimens (Table 13). India reported that there are government held stocks of pangolin specimens but did not provide information on quantities. India also noted that there are no privately held stocks in the country. Across Parties, most stocks are held by government agencies (rather than private individuals) and were sourced from confiscations or seizures and intended uses of the stocks include for educational purposes and exhibitions, as evidence, or destruction of the stocks. Namibia has yet to determine the use of its stocks.

Table 13. Stocks of pangolins held by Parties based on responses to Notification to the Parties No. 2021/016.

Party	Species*	Quantity/volume	Source	When constituted	Held by	Intended use
Bangladesh	*Manis* spp.	2x stuffed animals	Seized	Unknown	Bangladesh Forest Department	Education
Côte d'Ivoire	*Manis* spp.	3000 kg scales**	Seized	2017–2019	Central government	Destruction
Japan	*M. javanica; M. pentadactyla; M. culionensis; Manis* spp.	1x 'peel', 3x whole specimens (*M. javanica*) 0.8 kg 'peel', 5x whole specimens (*M. pentadactyla*), 1x whole specimen (*M. culionensis*), 4x "peel" (10.4 kg) (*Manis* spp.)	Whole specimens legally acquired	Unknown	Whole specimens privately held; "peel" held by government	"Peel" for use in public relations/exhibitions
Mozambique	*M. temminckii*	657 scales	Confiscated	2016 – September 2019	Protected area headquarters	Destruction/Evidence
Namibia	*Manis spp.**	224 scales	Confiscated	2010	Government	To be determined
New Zealand	*Manis* spp.*	1 taxidermied juvenile	Seized	2000–2003	Department of Conservation (secure storage)	Education
Nigeria	*M. tricuspis*	3,117.1 kg scales (92 bags, 2 cartons)	Seized	Unknown	National Environmental Standards and Regulation Enforcement Agency; Nigeria Customs Service	
Singapore	*Manis* spp.	1858.48 kg scales, 9.956 kg + 3000 pieces (skins), 0.19 kg of stuffed specimen	All legally acquired (pre-Convention)	Unknown	Privately held	Sale
Thailand	*Manis* spp.*	1,450 kg scales	Seized	Unknown	Customs	
Zimbabwe	*Manis* spp.*	132 live animals, 1635 scales, 72 trophies	Seized	2016–2020	ZimParks	Destruction (scales, trophies), release back into the wild (live animals)

*Species not stated; inferred to be *Manis* spp.

Table 14. Stockpiles of pangolin based on responses to Notification to the Parties No's 2017/035 and 2014/059. Note this does not include information on Parties that responded to Notification to the Parties No. 2021/016.

Party	Derivative and additional information	Species
Cameroon	1794 kg scales (government held)	*Manis* spp.
China	Scales, quantity unknown. Since 2008, provisions have been issued to strictly control and regulate stockpiles of pangolin scales. The stockpiles were catalogued and registered and the use is labelled.	*Manis* spp.
Italy	10 kg scales, derivatives (approx. 1000 units of medical derivatives.	*Manis* spp.
Kenya	1689.9 kg scales	*M. gigantea*
Liberia	50kg scales	*Manis* spp.
Nepal	392.45 kg scales; 2 skins	*Manis* spp.
Pakistan	Scales (limited confiscated consignments)	*Manis* spp.
Philippines	60 pangolins (164.69 kg)	*M. culionensis*
Senegal*	*M. gigantea*: 2x skins, scales; *M. tricuspis*: 1x skin, 1x skin and skull, 2x genitals; *M. tetradactyla*: 1x skin and skull	*M. gigantea, M. tricuspis, M. tetradactyla*
Togo	220.81 kg scales	*M. tricuspis*
Uganda	6500 kg scales	*Manis* spp.
United States	238 boot vamps; 69 tanned skins; 84 leather products (belts, boots, shoes), 1.17 kg raw scales; 8.7 kg of processed scales; 10 units of pills/tonics; 2 small, dried skin sections; 1 mounted specimen	*Manis* spp.
Zambia	4x skins	*M. temminckii*

*All museum specimens acquired in the period 1948-1955.

Two exceptions are Singapore and Japan. Singapore reported that it has privately held stocks of pre-Convention scales, skins, and stuffed specimens (Table 13) and reported that the intended use is commerce. Japan reported that it has a small number of whole individuals that are privately held. Botswana, The Gambia, Slovakia, and the United Kingdom reported that they do not hold stocks or stockpiles of pangolins or their derivatives.

Nineteen Parties stated in their responses to previous Notifications to the Parties on pangolins (No's: 2014/059 and 2017/035) that they possess stockpiles of pangolins (Table 14). Where Parties responded to earlier notifications and 2021/016, notable differences in reported stocks exist for Namibia and Thailand. Namibia previously reported possessing 170 skins, which were not reported in response to Notification to the Parties No. 2021/016. Thailand previously reported possessing 2281.75 kg of scales but only 1450 kg scales in response to Notification to the Parties No. 2021/016. Neither Namibia or Thailand reported disposing of or destroying stocks. Although DRC has not responded to recent Notifications to the Parties on pangolins, the Management Authority of DRC informed the CITES Secretariat in June 2017 that it possessed 13–14 tons of pre-convention pangolin scales (see CITES SC69 Doc. 29.2.2), which presumably still exist.

Stockpile recording systems

Of the respondents to the questionnaire attached to Notification to the Parties No. 2021/016, Bangladesh, India, Indonesia, Mozambique, Namibia, New Zealand, Nigeria, Singapore, the United Kingdom, and Zimbabwe reported that they have systems in place to record and keep record of stocks of pangolin products as recommended in Res. Conf. 17.10. These variously include written or electronic databases to record stocks (Annex 8). Singapore conducts regular inventory check of such stocks. In Zimbabwe, the stocks are monitored 24 hours a day (Annex 8). Botswana, Côte d'Ivoire, The Gambia, and Japan reported that they do not have a system in place to record and keep record of stocks of pangolin products. Botswana did report that recovered pangolin specimens are entered into a register which captures details about the specimen(s) and those of the offence, including the names of the accused and the location where offences have been committed. Côte d'Ivoire reported that a system for recording and monitoring seized stocks of wildlife products is being developed. Based on responses to previous notifications regarding pangolins, Kenya, Nepal and the Philippines have stockpile management systems in place.

Adequate control measures

Of the 17 Parties to respond to the questionnaire, 10 Parties consider that they have adequate control measures in place to secure stocks of pangolin parts and derivatives as recommended in Res. Conf. 17.10. This includes seven pangolins range States—Bangladesh, Côte d'Ivoire, India, Indonesia, Namibia, Nigeria, Singapore, and Zimbabwe; available details on each system

are provided in Annex 9. Botswana reported that the country does not have adequate control measures to secure stocks of pangolin parts, but did report that the country has a secure facility in the form of a strong room where all high value trophies are kept. The Gambia and Mozambique reported that they do not have adequate control measures in place. Japan noted that under the Act on Conservation of Endangered Species of Wild Fauna and Flora (ACES), trade in pangolins in the country is prohibited.

Disposal of stocks 2016–2020

Most Parties responding to the questionnaire attached to Notification to the Parties 2021/016 stated that they had not disposed of pangolin stocks in the period 2016–2020. This included Bangladesh, Botswana, The Gambia, India, Japan, Namibia, New Zealand, Nigeria, Slovakia, and the United Kingdom. Côte d'Ivoire, Indonesia, and Mozambique reported disposing of stocks while Singapore reported that there are no government-held stocks and that all seizures are destroyed by incineration. Côte d'Ivoire reported possessing 3000 kg with destruction being the intended use (Table 13) and reports (see Anon. 2020) suggest these scales may have already been destroyed. Mozambique reported disposing of three *M. temminckii* specimens. One was privately held and was burnt and the remains buried, and the other specimens held by the government were euthanised and incinerated. Indonesia reported destroying stocks of pangolins but provided no further details.

The destruction of stocks is in line with the provisions of Res. Conf. 17.8 on the destruction of stocks of Appendix-I species, including parts and derivatives, if not being used for bona fide scientific, educational, enforcement, or identification purposes. Parties are also not supposed to sell off confiscated Appendix-I specimens. However, it should be noted that insights from the examination of stockpile issues for other species (e.g., elephants; see 't Sas-Rolfes et al., 2014) suggest that stock destruction may violate the precautionary principle because associated outcomes for pangolin conservation are unknown. This could be the case if stockpile destruction led to accelerated wild harvest of pangolins if organised crime groups involved in trafficking sought to recover losses incurred through the seizure of large volumes of scales.

8. Enforcement issues

The Notification to the Parties No. 2021/016 questionnaire contained questions related to the enforcement of laws pertaining to the domestic and international trade in pangolins and their derivatives, challenges and best practices. Available information received from Parties is summarised below and full responses are provided in Annexes 10–14.

Law enforcement challenges to preventing poaching and illegal trade in pangolins

A number of law enforcement challenges were identified by range States in Africa and Asia concerning combating poaching, illegal trade, and other illegal activities involving pangolins, though it should be noted that these challenges are not necessarily pangolin-specific. They are discussed below as technical and human resource related challenges and were reported by Bangladesh, Botswana, Côte d'Ivoire, India, Mozambique, Namibia, Nigeria, and Thailand (Annexes 10–13). China reported that it does not face any law enforcement challenges with regard to preventing poaching, illegal trade, and other illegal activities concerning pangolins; this includes technical, human-resource, and budget-related challenges. Indonesia reported that it faces no technical resource challenges related to law enforcement.

Eleven Parties reported that a lack of equipment and technical resources are challenges to effective law enforcement. This includes a shortage of vehicles; a lack of vehicles and shortage of camping equipment needed to undertake effective patrols in remote or wilderness areas; a lack of funds for fuel for patrol vehicles; a lack of resources to adequately contain individuals that have been arrested (e.g., provision of food and transportation to a police station); a lack of, or inadequate, equipment (e.g., scanners, sniffer dogs) to detect pangolin specimens and inspect objects at ports of entry and exit. This includes ensuring effective enforcement in remote areas where pangolins occur, including in plantations (e.g., oil palm plantations) and border areas, especially in the context of high prices being offered to local community members for pangolins strongly incentivizing them to poach the animals. Similar challenges were previously identified five years ago in CITES SC69 Doc. 57. Annex 1. Nigeria was one of the countries reporting these problems (see Annexes 10–13); see CITES SC2020 Inf.6 and CITES SC70 Doc 27.3.5 for further discussion on Nigeria. See CITES CoP18 Doc. 34 for further discussion on law enforcement capacity in West and Central Africa.

Human resource challenges include inadequate budgets to effectively enforce applicable laws (including to employ sufficient numbers of well-trained law enforcement staff), a lack of law enforcement personnel, and inadequate capacity of frontline law enforcement officers. These human resource challenges were also previously identified in CITES SC69 Doc. 57. Annex 1.

These challenges are compounded by other related factors according to Parties. They include a limited or near complete lack of funding to implement outreach and education on pangolin protection status and illegal activities within range States and judicial systems unwilling to apply the extent of the law to punish pangolin poachers and traffickers. In some cases, in particular Mozambique, wildlife crime can only be handled by specific courts, which are often far from areas where crime takes place, which has significant implications for human resource and budget management (Annex 10). The lack of awareness or regard for environmental and wildlife laws amongst the citizenry and politicians in pangolin range States also makes enforcement and prosecution challenging.

Singapore highlighted that, as neither a source nor a destination for illegal pangolin trade, law enforcement would be more effective if it was intensified in source countries for pangolin products traded illegally and in destination countries, in order to eradicate demand for pangolin products, including taking legal action against the importers of products traded illegally.

Influence of corruption on the ability to enforce pangolin-related laws

Nigeria reported that corruption influenced the ability of the country to enforce laws affording protection to pangolins from poaching and trafficking. Nigeria described these issues as: (i) a lack of data management to ensure accountability among agencies, (ii) the long prosecution process which results in out of court settlements, (iii) seizures which are ostensibly abandoned, and (iv) funds for equipment (e.g., scanners at seaports) being misappropriated. Indonesia reported one case of corruption involving police personnel but did not provide further details.

Law enforcement best practices

In response to Notification to the Parties 2021/016, pangolin range States reported a number of law enforcement best practices regarding combatting the poaching and illegal trade of pangolins (Annex 14). These can be summarised as:

- Inter-agency cooperation and collaboration.
- Intelligence networking within local communities co-existing with pangolins.
- The destruction of seized pangolin products (see discussion in Section 7).
- Control at border posts and airports. Previously, Parties identified ensuring well-trained wildlife professionals accompanied by canine units are at all international entry and exit points (ports and seaports), including training on fraud relating to illegal trade.
- Use of technologies such as SMART to help map poaching hotspots.
- Random roadblocks to target illegal movements of wildlife including pangolins.
- Adoption of a whole-of-government approach, including a robust domestic framework combining strong enforcement, tough laws and heavy penalties.
- Employment of a comprehensive risk assessment framework to target individuals and cargo for strict inspection.
- Proactive steps to raise public awareness of illegal trade in pangolins.
- Train and upskill law enforcement agents.
- Cooperate with international partners in sharing intelligence, enforcement operations, and tracing poaching hotspots at source countries.

A number of other best practices were previously identified in responses to previous Notifications to the Parties on pangolins (No's: 2014/059 and 2017/035). These include the use of field staff experienced in detecting and dealing with illegal activities in and around protected areas, enforcement of wildlife legislation inside and outside protected areas being managed separately, and the creation of special task forces to investigate wildlife crimes. For example, such a task force within the Madhya Pradesh Forest Department in India has arrested 161 suspects from ten states within the country for poaching and illegal trade in pangolin scales in recent years. A second example is the establishment and operation of Wildlife Traffic Monitoring Units at strategic air and seaports to detect and prevent the illegal transport of wildlife including pangolins in the Philippines.

Domestic law enforcement operations

Numerous Parties indicated that they have taken law enforcement operations domestically that have targeted poaching and illegal trade in pangolins (Annex 15). India's Wildlife Crime Control Bureau (WCCB) launched the LESKNOW series of operations (LESKNOW, LESKNOW-II & LESKNOW-III) to draw the attention and focus of enforcement agencies

towards poaching and illegal trade of lesser-known species of wildlife including pangolins. Multiple agencies participated and several enforcement actions resulted. A total of 15 offenders were arrested during the LESKNOW operations and of 4 kg of scales, 2100 scales and 3 live pangolins were seized.

Indonesia's law enforcers have succeeded in uncovering and thwarting the smuggling of pangolin both on a large and small scale, either through water routes but also by land and air routes. The biggest operation occurred in 2015 when Indonesian law enforcement officers confiscated 5 tonnes of packed dead pangolins (frozen meat), 77 kg of scales, and 96 individual pangolins in a live state in a warehouse in North Sumatra. Lessons learned is the need for a good multi-stakeholder system of coordination, cooperation, and communication between law enforcers. Apart from that, the understanding and awareness of law enforcers and competent authorities regarding pangolin rescue also need to be improved.

International operations to combat pangolin poaching

Parties reported that they had collaborated with other countries and/or participated in international operations (e.g., under INTERPOL, World Customs Organization (WCO) and Wildlife Enforcement Networks) aimed at combating the poaching and illegal trade in species that has specifically or inadvertently included pangolins (Annexes 15 and 16). Of Parties responding to Notification to the Parties 2021/016, many had taken part in the INTERPOL and WCO Thunder operation in 2020, which resulted in seizures of pangolins, and other similar operations (Annex 16).

Singapore reported that there were three major domestic law enforcement operations in 2019 involving illegal container shipments of pangolin scales transiting through Singapore. All three cases involved over or close to 12,000 kg of pangolin scales declared as transhipment, with intended port of discharge at Haiphong, Viet Nam, and ports of loading at Nigeria and DRC. Pangolin scales were bagged and hidden among other goods, including packets of frozen meat, bags of cassia seeds, and sawn timber pieces. Two of the three cases involved elephant ivory in the same shipments. Singapore established a Mutual Legal Assistance agreement with China Customs and the information exchanged led to their arrest of 14 individuals in China. This was also reported by China.

Other examples include agencies in Thailand collaborating internationally. The Department of National Parks, Wildlife and Plant Conservation are tackling wildlife trafficking in the Golden Triangle, in cooperation with the World Wildlife Fund (WWF), including the WWF-Mekong Region, WWF-Thailand, WWF-Myanmar, WWF-Laos, and TRAFFIC with the aim of establishing inter-agency law enforcement cooperation. The aim is to increase the capacity of law enforcement officials to prosecute cases in connection with wildlife trafficking. Second, the Department of National Parks, Wildlife and Plant Conservation and United Nations Development Program (UNDP) received financial assistance from the Global Environment Facility (GEF) for the implementation of a project designed to combating illegal wildlife trade in ivory, rhino horn, tiger, and pangolins in Thailand.

Tools and materials for implementing Res. Conf. 17.10

CoP18 adopted Decisions 18.242 and 18.230b regarding the development of tools and materials that could assist Parties in implementation of Res. Conf 17.10. A number of Parties indicated that they have, or are, developing such tools or materials (Annex 17). Examples include Singapore. The National Parks Board launched the Centre for Wildlife Forensics in August 2020 to strengthen its detection and diagnostic capabilities to identify and analyse specimens involved in the illegal wildlife trade. In addition to morphological and histochemical analyses of seized items, the Centre can utilise other molecular tools—e.g., DNA analysis methods such as next generation sequencing, and chemical methods such as mass spectrometry and isotope analysis—to provide greater resolution and deeper insights on the seized items, such as the origin of the population of species that have been poached. Such information can help international organisations and source countries to undertake further investigation and targeted enforcement action at poaching hotspots. These capabilities will also enable the analysis of seizures throughout the globe to identify potential linkages and syndicates through collaborations with international experts and organisations. The United Kingdom reported that a team at the University of Portsmouth has developed a technique for lifting fingermarks from the scales of pangolins, demonstrating the potential to connect criminals to illegally traded pangolins via fingerprints (see Annex 17).

Dismantling of organised crime groups

A number of Parties reported having identified and dismantled organised crime groups and/or detected new methods being used by such groups involved in the poaching and/or trafficking

of pangolins in the last 5 years. However, not all Parties elaborated further on these responses. China and Singapore did and India provided a description of how organised crime groups operate in the country.

China reported that Forest police in Hunan province have broken up a nationwide illegal trade network that transported pangolins from Guangxi province to Guangzhou in 2018. 129 criminal suspects were detained and 25 arrested, and 32 suspects have been pursued online. 216 *Manis javanica* individuals, 66 kg of scales, and other wild animals and their products were confiscated. More than CNY 18 million of illicit gains was seized.

In 2019, Singapore received a tip from Fuzhou Customs and Xiamen Customs of China regarding an illicit shipment of pangolin scales travelling from Nigeria to Viet Nam, which was due to transit through Singapore. Based on this information, in April 2019, Singapore stopped two large shipments (25.6 tonnes total) of pangolin scales. Following the seizure, Singapore shared information with China through mutual legal assistance channels. Subsequently, in July 2019, Singapore seized another container containing 11.9 tonnes of pangolin scales and 8.8 tonnes of elephant ivory, based on intelligence provided by Nanning Customs of China. Once again, through mutual legal assistance, information prepared by Singapore was handed over to the Chinese authorities. In both instances, this bilateral information exchange helped China to pursue its investigations, leading to arrests of suspects of Chinese nationality based in Africa and Viet Nam. The efforts by the Singapore and Chinese authorities were also recognised by the UN Asia Environmental Enforcement Awards 2019 for the significant contribution to combat wildlife crime. Bags of pangolin scales were falsely declared and hidden among a range of goods, namely, frozen beef, cassia seeds and sawn timber. Two shipments of pangolin scales were mixed with elephant ivory tusks.

India reported that pangolins are generally poached by members of traditional nomadic hunting groups who live in temporary shelters either at the periphery of wildlife rich areas or at nearby towns and railway stations. They are sometimes engaged by farmers, especially in the States of Madhya Pradesh, Uttar Pradesh and Rajasthan, to protect crops from wild animals and may opportunistically hunt pangolins at night. They have traditional knowledge and skills in detecting pangolin burrows. The meat of the animal may be consumed or sold locally, and the scales are stored for selling to middlemen in the illegal trade. Once significant quantities of

scales are gathered, they are sold to middlemen with links to illegal traders based in cities. From collection centres, they are transported to international borders mainly in trains by human carriers, often women. They prefer to travel at night and reach the destinations in early mornings. However, there are instances when pangolin scales have also been transported by postal parcels or courier service and by air. Postal parcels are usually sent with fake names and addresses of consigners and consignees. In such cases, deliveries are taken personally from the destination post offices. Delhi, Chennai, Kolkata, Behrampur, Siliguri, Imphal and Dimapur are reported as main transit centres within the country. From Delhi, Chennai and Kolkata, pangolin scales are transported mostly by railways and postal or courier parcels to towns near the Indo-Nepal, Indo-Bhutan and Indo-Myanmar borders. Though the entire porous international border with Nepal, Bhutan and Myanmar are prone to smuggling, Darchula, Gorakhpur, Raxaul, Motihari, Siliguri, Dimapur, Champhai (Mizoram), Imphal and Moreh (Manipur) are important towns through which wildlife articles are routed before smuggling across national borders. There have been instances when pangolin scales were transported by air from Chennai to Delhi and from Delhi and Guwahati to Imphal. Recently, Siliguri has become a highly sensitive transit centre or route for wildlife smuggling and traffickers from Northern and Central India who are transporting wildlife articles, including pangolin scales, direct to Siliguri. From Siliguri, contraband may be taken to Nepal through Panitanki or transported closer to the Bhutan and Myanmar borders. From Dimapur and Imphal, smuggling takes place to Myanmar through Moreh in Manipur. Due to increased enforcement activities in Manipur, wildlife articles are increasingly being routed through Mizoram to Myanmar.

9. Conclusions

All eight pangolin species remain threatened with extinction, being listed as Critically Endangered, Endangered, or Vulnerable at the global level on the IUCN Red List of Threatened Species. Research is generating greater knowledge of pangolins, including population estimates in places. However, there remains a lack of up-to-date knowledge of the status of the species in most range States, especially throughout Africa, including basic information on distribution.

There has been little international trade in pangolins reported to CITES post-2014, which is dwarfed by volumes of illegal trade in the period 2016–2020. Illegal trade in this period based on data from CITES Parties, UNODC, and the CITES Secretariat involved an estimated ~259,000 pangolins. However, data from other sources suggest that actual illegal trade volumes were much higher, involving ~600,000 pangolins between 2016 and 2019 and potentially close to a million pangolins in the last decade, including all eight species. An impact of the transfer of African pangolins from Appendix II to I is that international trade authorised by CITES authorities has ceased but is continuing illegally. Reports of seizures involving pangolins typically refer to 'pangolin' or '*Manis* spp.,' which precludes accurate assessment of illegal trade in the different species. Knowledge gaps around the harvest of pangolins for local and national (i.e., domestic) use and international trade precludes a holistic understanding of the impact of harvest for use and trade at all levels. Although identification materials for pangolins are available, Parties welcomed more training, better access to existing materials, and new identification materials.

While law enforcement best practices exist among Parties (e.g., inter-agency cooperation), only 19 of 56 pangolin range States have Standard Operating Procedures (SOPs) in place for disposing of confiscated pangolin specimens. This is a concern for implementation of the Convention because of the number of animals and quantities of their derivatives in illegal trade and the lack of systems in place to ensure that they do not re-enter illegal trade. Although Parties are actively implementing domestic measures, and participating in international efforts, to address illegal trade in pangolins, critical law enforcement challenges remain, especially among pangolin range States. These include an ongoing lack of technical, human, and budgetary resources to adequately enforce applicable laws implementing the Convention.

Annex 1. Methods used to estimate number of pangolins in trade

Various pangolin derivatives are found in legal and illegal trade. For the purposes of this report, we used conversion parameters in the published literature and as used in CITES SC69 Doc. 57 Annex 1. These are presented in the below table. Regarding legal trade, this applies to the conversion of quantities of scales to equivalent numbers of whole pangolins (EWP). These calculations are not done by UN Environment World Conservation Monitoring Centre while curating the CITES database. For illegal trade, we used these parameters to estimate the EWP from quantities of scales, meat, and live or dead pangolins if reported by weight only. Other derivatives (e.g., trophies and small leather products) were not equated to number of pangolins. Where seizure reports referred to particular species of pangolin being trafficked, we used species-specific parameters from the table below to calculate the number of pangolins involved. Where records did not report beyond genus or Family level, we used parameters for *Manis* spp., which are based on *M. javanica*. Note that Decision 18.239 from CITES CoP18 has called for the derivation of more accurate conversion parameters for all species, and thus these will be updated with the availability of that report.

Species	Derivative		
	Individual (kg)	Scales (g)	Meat (kg)
M. pentadactyla		573.47	
M. javanica	4.96	360.51	4.59
M. culionensis	4.96	360.51	
M. crassicaudata		1000	
M. tetradactyla			
M. tricuspis		360.51	
M. gigantea		3600*	
M. temminckii			
Manis spp.	4.96	360.51	4.59

*Originally taken from Tikki Hywood Trust (2013).

Annex 2. Detailed information on the status of Asian pangolins

Manis pentadactyla

Bangladesh – In response to Notification to the Parties No. 2021/016 Bangladesh reported that in the last five years it considers populations of this species to have declined. The IUCN Red List for Bangladesh for 2015 includes the species as Critically Endangered. Bangladesh further reported that the species can be found in the Chittagong Hill Tracts in the southeast of the country, the hilly areas of Sylhet (Lawachara National Park), Chittagong and Cox's Bazar, and in Mymensingh and Kurigram. In 2017, Trageser et al. (2017) reported that the species is present in Lawachara National Park and potentially in the surrounding protected areas and tea estates. Small numbers of *M. pentadactyla* were reportedly killed by hunters in 2015 in the Chittagong Hill Tracts region, with hunters suggesting that the species was extirpated from most of this region by 2014 due to commercial level poaching between 2010 and 2014 (Trageser et al., 2017).

Bhutan – The species occurs in southern Bhutan but potentially in central and western areas only; it is confined to elevations below 2000m above sea level (Challender et al., 2019a; Srinivasulu & Srinivasulu 2012; Baral & Shah 2008). Dorji et al. (2019) report that the species was detected by a camera trap outside of protected areas in Bhutan between 2014 and 2015, and Kinley et al. (2018) report that the species was recorded for the first time in Tsirang District, southern Bhutan in April 2018. Dorji et al. (2020) investigated habitat preferences and distribution of the species in Dorokha Dungkhag, Samtse, southwestern Bhutan in 2017 using belt transects and sign surveys. They estimated burrow density at 0.10/ha with burrows mainly distributed in habitat dominated by needlework trees (Schima wallichii), evergreen broadleaf (Castanopsis hytrix) and shrubs (Viburnum spp.). Beyond these studies, little is known about the status of *M. pentadactyla* in Bhutan.

China – China comprises the largest part of the range of *M. pentadactyla*, where it is listed as Critically Endangered in the country's Red Data Book for mammals (Jiang et al., 2016). In response to Notification to the Parties No. 2014/059, China reported that populations of the species declined between 2010 and 2015. Populations of this species were estimated to comprise 50,000–100,000 animals in 2002 (Wu et al., 2002), having declined by up to 94%

since the 1960s (Wu et al., 2004). This is reportedly due to high levels of exploitation during the 1960–1980s when an estimated 160,000 pangolins were harvested annually in China for consumptive use (Zhang, 2008). It is further reported that this number declined to a few thousand animals by the 1990s (Zhang, 2008). Yang et al. (2018) estimated that the range of the species in three Provinces in Eastern China (Fujian, Jiangxi, and Zhejiang) declined by 52% between the 1970s and early 2000s and that the population in this region is now mainly confined to the Wuyi Mountains. More positively, there are reports of *M. pentadactyla* in various provinces in mainland China in the last decade, including evidence of breeding. Using a range of sources, including camera traps and news reports, Zhang et al. (2021) report 157 observations of the species in eight provinces (Anhui, Zhejiang, Jiangxi, Fujian, Guangdong, Guangxi, Yunnan, and Hainan) between July 2010 and June 2020, including various observations of females with young. Further, Li et al. (2020) present camera trap records of this species from 2017 and 2018 in Wuyanling National Nature Reserve, southern Zhejiang Province.

The population of the apparent subspecies on Hainan Island, *M. p. pusilla*, is considered to have declined to the point of commercial extinction due to ongoing exploitation (Nash et al., 2016), but has been observed in the last decade (Zhang et al., 2021). See Wu et al. (2020) for discussion on the *M. pentadactyla* subspecies.

Hong Kong SAR – In Hong Kong SAR the species has been recorded in the central and northeast New Territories and on Lantau Island where it occurs at low altitudes but does not occur on small outlying islands (Shek et al., 2017). In 2017, experts in Hong Kong considered there to be very low poaching pressure on local populations (Ades, G. in litt. to the authors, 2017).

Taiwan Province of China – *Manis pentadactyla* has reportedly recovered from historical declines in some places and evidence suggests that populations are stable, if not increasing, in Taiwan Province of China and poaching is no longer the main threat (Kao et al., 2019). Pei (2010) estimated densities in some areas of 12–13 adult pangolins/km2. Kao et al. (2019) report on outputs from a Population and Habitat Viability Assessment (PHVA) process for *M. pentadactyla* completed in 2017, which estimated, very approximately, a meta-population for Taiwan Province of China of 15,000 individuals. However, this estimate should be treated with

caution due to significant knowledge gaps in parameters used to inform this estimate (see Kao et al., 2019). Sun et al. (2019) report on factors causing morbidity and mortality in *M. pentadactyla* in Taiwan Province of China. Despite being a proficient burrower, the species is susceptible to getting trapped in tree hollows or ground burrows, which can prove fatal, and commands further research. Causes of morbidity include pangolins being caught in gin traps and being attacked by dogs (Sun et al., 2019). Further, Sun et al. (2020) evaluated the genetic diversity of a restored Chinese pangolin population in the southern Coastal Mountain Range of Taiwan Province of China. Studying 54 individuals they found a low level of genetic diversity and heterozygote deficiency, which they attributed to overexploitation of the species for the leather industry between the 1950s and 1980s and indicating that the population had experience an associated demographic bottleneck.

India – There is little information on the population status of the species in India where it occurs marginally in the north and northeast of the country. It was assessed as Endangered in India in 2005 using IUCN's Red List Categories and Criteria, and seizures suggest that it is under heavy collection pressure (Mohapatra et al., 2015). India reported in response to the Notification to the Parties No. 2021/016 that the species is data deficient in the country. In northern India, there is evidence of the species in Bihar (Challender et al., 2019a) and it has been recorded in northeastern provinces (Arunachal Pradesh, Assam, Meghalaya, Nagaland, Manipur, Tripura, Mizoram, Sikkim and the northern part of West Bengal) (Tikader 1983, Zoological Society of India 2002, Srinivasulu and Srinivasulu 2012). *Manis pentadactyla* also occurs in the Kaziranga-Karbi-Anglong and Manas-Bhutan landscapes and there are recent (post-2015) camera trap records from Manas National Park (D. Lahkar, unpubl. data), and reports of the species from near Sirohi Wildlife Sanctuary, Bunning Wildlife Sanctuary and Yangoupokpi-Lokchao Wildlife Sanctuary in Manipur (J. Sethy, unpubl. data). The species appears to be sympatric with *M. crassicaudata* in the Neora Valley National Park (Mallick 2010) and Manas National Park (Lahkhar et al. 2018; Goswami and Ganesh 2014).

Lao PDR – There were two field sightings during 1994–1995 but such sightings are now extremely rare primarily due to historic exploitation (Nooren & Claridge 2001). There are unverified camera trap records from Nakai-Nam Theun National Biodiversity Conservation Area (NCBA) in the early 2010s (Coudrat, 2017). There is otherwise little documented knowledge of the status of the species in Lao PDR.

Myanmar – *Manis pentadactyla* occurs in northern and western Myanmar, and though little is known about the species' status there, it could plausibly be widespread. In the last three years it has been reported in a small number of locations, including protected areas in northern Myanmar (Mark Grindley/FFI Myanmar in litt. to the authors, 2017). There is a potential record from Hkakaborazi National Park in northern Myanmar from post-2000 (Rao et al. 2005).

Nepal – In 2011, the population was estimated at 5,000 individuals when the species was assessed as Endangered nationally using IUCN's Red List Categories and Criteria and is reported to be in decline (Jnawali et al., 2011). However, in response to Notification to the Parties No. 2017/035, Nepal stated that there was a deficiency of data for wild pangolin populations in the country. In 2017, Nepal reported that based on a National Pangolin Survey conducted in 2016 that 53 districts in the country (comprising 20,750 km2) are considered suitable pangolin habitat. The Pangolin Conservation Action Plan for Nepal (2018–2022) notes that the species occurs in 25 districts in the country, and potentially a further 14 (DNPWC and DoF, 2018). Recent research has generated further knowledge of M pentadactyla in Nepal. Suwal et al. (2020) determined the distribution of pangolins in the country based on sightings, indirect signs, and a range of environmental variables. They detected pangolin presence in 61 out of 75 districts in eastern, central and western parts of the country, and predict that 15.2% (22,393 km2) of total land in Nepal is potentially suitable for pangolins. Sharma et al. (2020a) conducted a similar study and predicted 28,768 km2 of suitable habitat for the potential occurrence *of M. pentadactyla* nationally. Sharma et al. (2020b) used site occupancy and pangolin signs in Gaurishankar Conservation Area and the non-protected Ramechhap District in central Nepal with environmental covariates to understand factors influencing occupancy. Average (± SE) *M. pentadactyla* occupancy and detection probabilities were 0.77 ± 0.08 and 0.27 ± 0.05 respectively. Detection probabilities were higher in protected areas than non-protected areas and the most important covariates for detectability were soil type, food source, distance to road, and protected area status (see Sharma et al., 2020b).

Thailand – The only records are from Doi Inthanon in Changwat, Chiang Mai and Doi Sutep in the early 1900s (Allen and Coolidge, 1940). However, the species was listed as Endangered in Thailand in 2005 (Nabhitabhata & Chan-ard 2005). Thailand has previously reported that *M. pentadactyla* is rarely observed and little information exists on the conservation status of

the species in the country. Thailand responded to Notification to the Parties No. 2021/016 stating that based on the best available information populations of the species declined in the last five years.

Viet Nam – There is little new information on the status of the species in Viet Nam. In response to Notification to the Parties No. 2014/059 Viet Nam reported that pangolin populations in the country declined between 2010 and 2015. *Manis pentadactyla* is confined to the north of the country as far south as Quang Tri province (Challender et al., 2019a; Wu et al., 2020). It is considered very rare, and while research in 2008 reported that hunters still find the species in certain national parks in the country, all hunters reported that the species is extremely rare and that populations had declined dramatically over the preceding two decades (Newton et al., 2008; Newton 2007).

Manis javanica

Brunei Darussalam – Brunei Darussalam reported in response to Notification to the Parties No. 2014/059 that *M. javanica* populations in the country increased in the period 2010–2015 but also reported there to be a deficiency of data on populations. This species has been reported in all four districts of Brunei Darussalam (Brunei Muara, Tutong, Kuala Belait and Temburong) though little is known about the status in any of them (Fletcher 2016). Interviews with local people in the late 2010s suggest that populations started to decline in the 1980s due to poaching, and that pangolins are caught in traps set for mouse deer (Fletcher 2016). Fletcher (2016) further reported that the species continues to be offered for sale through social media and between 2013 and 2015 a local wildlife club released 11 individuals that were found for sale online or handed to members of the club by the public on finding them around their homes.

Cambodia – Cambodia previously reported that there is no recent information on the status of *M. javanica* in the country and did not submit a response to Notification to the Parties No. 2021/016. It is known that the species is present in a number of forest reserves in Cambodia, including the Cardamom Mountains, the Elephant Mountains, Central Cambodian Lowland Forests (Prey Long), Eastern Plains Landscape, Northern Plains and in Northeast Cambodia (Chong et al., 2020). However, populations are considered to be declining and hunter interviews suggest the species has been extirpated from some areas due to hunting (Challender

et al., 2019b). In 2007, Cambodia categorised the species as 'rare'. Extensive camera trapping conducted across many of the country's protected landscapes since 2012 has generated very few records of this species, though it should be noted that it is difficult to detect *M. javanica* with general large mammal focused camera trapping efforts (see Khwaja et al., 2019). Yet since 2010 the species has been detected in deciduous dipterocarp dominated areas of Preah Vihear Province in the Northern Plains (Songkom Thmey District, May 2017, G. McCann *in litt*. 2017), Chep Wildlife Sanctuary (Suzuki et al. 2017) and in Virachey National Park, Rattanakiri (McCann and Pawlowski 2017). Since 2016 *M. javanica* has also been detected in the Southern Cardamom National Park and northern Botum Sakor National Park, Koh Kong province (Gray et al. 2017). Despite low detection rates, *M. javanica* remains regularly confiscated by law enforcement teams throughout the country (Wildlife Alliance *in litt.* 2017).

China – There is uncertainty over the occurrence of the species in China. Wu et al. (2005) suggest that the species is marginally present, occurring in Yunnan Province in the southwest of the country. This is based on museum records held at the Kunming Institute of Zoology but there is uncertainty over the provenance of these specimens (Chong et al., 2020). The species is listed as Data Deficient in China's Red Data book for mammals (Jiang et al., 2016).

Indonesia – *Manis javanica* is widely distributed in Indonesia, including Sumatra, Java, Borneo, Kiau and the Linngga archipelago, Bangka and Belitung, Nias and Pagi islands and Bali and adjacent islands (Corbet and Hill, 1992). Indonesia has responded to previous Notifications to the Parties noting that although robust data on direct levels of offtake are not available, the high number of confiscated individuals in recent years and shifting trends in where animals are confiscated supports the strong belief that illegal trade is negatively impacting pangolin populations. This species is known to be present in national parks, nature reserves, wildlife sanctuaries and protected forests in Java, Kalimantan and Sumatra. Semiadi et al. (2008) reported that in the Riau Archipelago, in Riau Kepulauan Province, pangolins are distributed on both large and small islands but are predominantly found in the biggest districts: Kepulauan Lingga Dao, Keuplauan Singkep and Kepulauan Senayung. In 2008, it was reported that pangolins in these areas were abundant and easily found in the dry bauxite hills and rubber plantations, but that harvesting by local people had increased in the period 2005–2008 (Semiadi et al., 2008). More recently, it was reported that populations are declining in other parts of the country, including in Lampung Province, Sumatra (Wirdateti et al., 2013) and on Java

(Takandjandji and Sawitri, 2016). Interviews with poachers in Lampung Province in 2012 revealed that each poacher collected on average 25–30 pangolins per month, which has declined from up to 50 pangolins per month in 2009 (Wirdateti et al., 2013), potentially because the animals are less abundant. In Bali, local people report that 30 years ago pangolins would wander into household gardens around Ubud and central Bali, whereas now it is hard to find them and *M. javanica* is very rare (H. Nash, unpubl. data).

Lao PDR – There is little new information on the status of *M. javanica* in Lao PDR. Although the species was presumably widespread historically, interviews with villagers in three separate areas of the country in the 1990s suggested populations had declined by more than 90% between the 1980s and 1990s due to overexploitation for consumption and trade (Duckworth et al., 1999; Nooren and Claridge, 2001). There are unverified camera trap records from Nakai-Nam Theun NCBA from the 2010s (Coudrat, 2017).

Malaysia – Malaysia has previously responded to Notifications to the Parties on pangolins that there is no recent information on the status of the species in the country. *Manis javanica* is widely distributed in the country, including Peninsular Malaysia (and Penang), Sabah and Sarawak and surrounding islands, and the species occurs in tropical forests, including in national parks and wildlife reserves, and gardens and plantations (e.g., rubber, oil palm) (Numata et al., 2005). In Peninsular Malaysia, the species was described as common in some areas, at least up until the 1990s, and is still present in oil palm plantations in Selangor and Negeri Sembilan based on interviews with plantation workers. However, where interviews have been conducted the species is reportedly declining due to poaching for trade (Azhar et al., 2013; Ickes and Thomas, 2003). Interviews with hunters and villagers, including Orang Asli, in various parts of Peninsular Malaysia, including Kelantan, Pahang, Terengganu, and Johor, suggest that populations are declining (Chong et al., 2016; Challender et al., 2019b). The species was listed as Vulnerable in Peninsular Malaysia in 2012.

In Sabah, *M. javanica* has previously been considered common (see Challender et al., 2019b). There is little recent data on the species' status in the state but it is present in a number of forest and wildlife reserves and wildlife sanctuaries. Interviews conducted in and around Sepilok-Kabili Forest Reserve and the Lower Kinabatangan Wildlife Sanctuary in the period 2011–2019 suggest that populations are declining (see Challender et al., 2019b). The species was

detected using camera traps during the 2010s (e.g., Maliau Basin and Imbak Canyon; Bernard et al., 2013) but is rarely seen compared to 10 years ago (E. Panjang, unpubl. data). *Manis javanica* is under demonstrable collection pressure in Sabah. Between 2007 and 2009, more than 22,000 pangolins were collected in the state for illicit export to East Asia (Pantel and Anak, 2010), and in February 2019 authorities in Sabah seized 30 tonnes of live and dead *M. javanica* and quantities of scales (Anon, 2019).

Manis javanica is present in Sarawak (e.g., Wilson 2006) and though there is little information on current status, populations are reportedly declining (Ju lian Chong in litt. to the authors, 2017). Surveys conducted in 2005 report that the species is present at Bintulu (Wilson et al., 2006), but is apparently absent from the extensive peat swamp forests in this state (CITES, 2000). Kaicheen and Mohd-Azlan (2018) recorded the species in the Mt. Penrissen area in the period 2015–2017. The species does appear in the bushmeat trade in Sarawak, especially in markets in Kuching, Sibu and Kapit (J.L. Chong, unpubl. data).

Myanmar – Myanmar responded to previous Notifications to the Parties on pangolins that there is little new information on the status of the species in the country. It is known that *M. javanica* is distributed in central and southern parts of the country but has reportedly been eradicated from lowland areas due to hunting and agricultural expansion (Corbet and Hill, 1992; Challender et al., 2019b). The species has been recorded in Tanintharyi region in southern Myanmar since around 2015 (Mark Grindley/FFI Myanmar *in litt.* to the authors, 2017), and recent observations of *Manis* spp. in Kayin state most likely refer to *M. javanica* (Moo et al., 2017). The species is harvested in the country and trafficked internationally (Nijman et al., 2016; Zhang et al., 2017).

Singapore – *Manis javanica* is found in Singapore and is mainly distributed in the Central Catchment Nature Reserve and Bukit Timah Nature Reserve but can also be found in forested areas in Bukit Batok, the Western Catchment Area, and on the islands of Pulau Ubin and Pulau Tekong (Singapore National Parks, 2017). Populations are considered stable, and the species is reported to be breeding. Nash et al. (2020) report the population has been estimated at 1046 (575–1604) individuals. The global IUCN Red List assessment for this species notes that roadkill is the biggest threat to the species in Singapore (Challender et al., 2019b).

Thailand – Thailand has previously reported that *M. javanica* is rarely observed and little information exists on the conservation status of the species. In response to Notification to the Parties No. 2021/016 Thailand reported that, based on the best available information, populations of the species declined in the last 5 years. Previous reports note that this is due to collection for local use and international trade, including poaching and illegal trade in live pangolins, which is believed to be having a detrimental impact on populations. Many pangolins have been confiscated from illegal trade in the country in recent years (Challender et al. 2015; Heinrich et al., 2017).

Viet Nam – Viet Nam reported in 2015 that pangolin populations in the country declined between 2010 and 2015. This is supported by research conducted in 2007 during which hunters revealed that in three areas of Viet Nam populations of *M. javanica* declined dramatically in the preceding few decades due to hunting and poaching, in particular since the 1990s, and that this species is rare (Newton et al., 2008). Other research (Nuwer and Bell, 2013; MacMillan and Nguyen, 2013) corroborates these reports. *Manis javanica* was listed as Endangered in the Viet Nam Red Data Book in 2007. Enforcement activity in the last decade suggests that the species is still present in Dak Nong, Kon Tum, Quang Binh and Gia Lai provinces and U Minh Thuong and U Minh Ha National Parks (Willcox et al., 2017; see Challender et al., 2019b).

Manis culionensis

Philippines – The Philippines reported in previous responses to Notifications to the Parties on pangolins that *M. culionensis* was listed as Vulnerable under the Department of Environment and Natural Resources (DENR) Administrative Order 2004-15. However, since 2nd January 2017 and the transfer of the species from CITES Appendix II to I, it is categorised as Critically Endangered.

There has historically been little quantitative data on the status of *M. culionensis*, but further knowledge is now being generated. The species has been described as uncommon historically (Heaney et al., 1998), but also fairly common by local informants (Esselstyn et al., 2004) and is subject to heavy hunting pressure (Schoppe et al., 2019). Available evidence suggests that the species is more abundant in northern and central parts of Palawan Island and much rarer in the south (Schoppe and Cruz 2009). Schoppe et al. (2020) note that mean (± SD) adult density

on Palawan was 2.5 ± 1.4 adults/km^2, being highest in northeastern Palawan (3.5–4.0 adult/km^2) and lower in the south (1.8 ± 1.61 adult/km^2). Archer et al. (2020) present results which support this assertion, with a significantly higher sighting probability in the north compared to the south of the species range. The Philippines previously reported that the species is understood to occur at higher densities in primary forest than in mixed residual forest and brushland; Lagrada (2012) estimated densities of 0.05 individuals per km^2 in mixed forest/brush land.

In the last decade local hunters have reported that populations are declining as a result of hunting and Lagrada (2012) reported that increased effort is now needed to catch pangolins, a likely consequence of declining populations. Monthly catch decreased from an average of 12 pangolins in the 1990s to only one pangolin per month in 2013 (though in some months zero pangolins were caught) suggesting that populations are decreasing (Schoppe and Alvarado, 2015). Interviews with Indigenous Peoples groups from Tagbanua, Batak, and the Palaw'an Tribes, and Cuyunon communities from Palawan and the Calamain Islands, resulted in estimated population declines of 85% in the south of the species' range and 95% in the north between 1980 and 2018 (Acosta and Schoppe, 2018). Archer et al. (2020) investigated *M. culionensis* status and threats based on local ecological knowledge (LEK). Most respondents (72%) that were able to identify a pangolin perceived the species to be 'rare' or 'very rare'; 22% of these respondents perceived *M. culionensis* to be 'common' or 'very common'. However, pangolin declines were reported by respondents from all municipalities (excluding Linapacan; i.e., 17/18 municipalities surveyed). More positively, these results suggest that *M. culionensis* is still present across much of Palawan Province, with sightings from 2018 and 2019 (Archer et al., 2020). Archer et al. (2020) further reported ongoing local use for a variety of purposes (e.g., medicinal) as well as domestic trade.

Manis crassicaudata

Bangladesh – Bangladesh reported in response to Notification to the Parties No. 2021/016 that based on the best available information wild populations of *M. crassicaudata* declined in the last 5 years. The IUCN Red List of Bangladesh for 2015 includes the species as Critically Endangered (IUCN Bangladesh, 2015). A review of available evidence of pangolin presence in Bangladesh (Trageser et al., 2017) suggests that the species occurs in the north- and

southwestern part of the country, excluding the coastal areas of Khulna, Satkhira, Bagerhat, Barisal and Patuakhali (see Mahmood et al. 2020 for further discussion). However, little else is known about the status of this species in Bangladesh and further research is warranted.

China – Although some sources (e.g., Heath 1995; Smith and Xie 2013), consider China a range State for this species based on historical records from Yunnan Province there is serious doubt surrounding the validity of these records. There is no recent evidence of presence and a review of available evidence (Mahmood et al., 2020) concluded that the occurrence of the species in China is likely a case of historical mistaken identity. China lists this species as Data Deficient in its Red Data book for mammals (Jiang et al., 2016).

India – In response to Notification to the Parties No. 2021/016, India reported that recent information on the status of the species in the country does not exist (i.e., is data deficient). *Manis crassicaudata* was listed as Vulnerable at the national level in 2005 using the IUCN Red List Categories and Criteria based on past, ongoing and future population declines due to overexploitation (Molur, 2005). The species occurs widely in the country from the foothills of the Himalayas to the south of the country, though excluding north-eastern states (Tikader 1983; Mahmood et al., 2020). There are historical records from Kerala and Kanyakumari, Tamil Nadu, Delhi, Madhya Pradesh, Karnataka, West Bengal, Goa, Gujarat, Rajasthan, as well as Uttar Pradesh, and Mishra and Panda (2012) report its presence in 14 out 30 districts in Orissa based on animals that have been recovered from trade (CITES, 2000). Srinivasulu and Srinivasulu (2012) state this species also occurs in Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Maharashtra and Uttarakhand. In the early 1980s it was reported that populations had been greatly reduced by hunting, and seizures of pangolins being trafficked in India suggests that the species remains subject to poaching pressure for international trade (Mohapatra et al., 2015) and as well as local use (D'Cruze et al., 2018). Research conducted in Chiplun taluka (an area of approximately 10,000 km^2 in Ratnagiri district, Maharashtra) in 2016 suggests that *M. crassicaudata* is present in 90 out of 164 villages in this area (Anon., 2017). There is a genuine need for a better understanding of the species' present distribution and India and quantitative data on populations to inform management (Mahmood et al., 2020).

Nepal – Nepal reported in response to previous Notifications to the Parties on pangolins that there is a deficiency of data on wild pangolin populations, but did report, based on a National

Pangolin Survey conducted in 2016, that 53 districts in the country (comprising 20,750 km^2) are considered to comprise suitable pangolin habitat. The Pangolin Conservation Action Plan for Nepal (2018–2022) records the species as occurring as seven districts: Kanchanpur, Chitwan, Parsa and Bara, Surkhet, Banke and Bardia, and potentially a further 14 districts (DNPWC and DoF, 2018). *Manis crassicaudata* was assessed as Endangered at the national level in Nepal using the IUCN Red List Categories and Criteria in 2011. This was based on the species' small geographic range in the country (<5,000 km^2), limited in number of locations, and there being a continuing decline (observed, estimated, inferred or projected) on the basis of the extent and/or quality of habitat and number of mature individuals. Jnawali et al. (2011) report that the species has an extent of occurrence of approximately 3,000 km^2 across three locations and it is unlikely that the species intermixes between sites. The main threat to the species in Nepal is poaching for meat consumption and trade in scales and other body parts internationally, and deforestation and infrastructure development—including road construction and hydropower development—which destroys and fragments habitat (Khatiwada et al., 2020).

Pakistan – Pakistan reported in response to previous Notifications to the Parties on pangolins that detailed studies had not been conducted on population status and trends nationally, but it was believed that populations of *M. crassicaudata* were declining. The species was categorised as Vulnerable nationally in 2005 using IUCN's Red List Categories and Criteria on the basis of past and future population declines (Molur, 2005). Research conducted in the last decade has generated further knowledge. The species is locally distributed but has been recorded in all four provinces in the country, Khyber Pakhtunkhwa, Punjab, Sindh, and Balochistan, as well as in Azad Jammu and Kashmir (Roberts, 1977; Mahmood et al., 2019). While there remains a need for further quantitative population data for this species, Irshad et al. (2015) estimated that the average population density in the Potohar Plateau region declined by 80% between 2010 and 2012, from approximately one individual per km^2 to one every $5km^2$. Waseem et al. (2020) estimated that *M. crassicaudata* occupies 32% of a large study area comprising the Potohar Plateau and districts in Azad Jammu and Kashmir. Based on available literature *M. crassicaudata* densities vary between 0.00044 individuals/km^2 in Maneshra district, Khyber Pakhtunkhwa (Mahmood et al., 2018) to 0.36 individuals/km^2 in Margalla Hills National Park, Islamabad (Mahmood et al., 2015). Declines, including those inferred from density estimates referred to above, have been attributed to illegal killing of the animals for their scales for export to East Asia. This has included at least 412 animals between 2011 and 2013 in the Potohar

Plateau (Mahmood et al., 2019) and a further ~500 animals killed illegally for similar reasons in the same period in Azad Jammu and Kashmir (Tariq Mahmood *in litt.* to the authors 2016). However, it should be noted that the above density estimates typically make a number of assumptions. They include that one active pangolin burrow equates to one pangolin occupying a survey area, that all active burrows are located, and all burrows identified as active reflect pangolin activity as opposed to that of other species. In short, active burrow densities are equated to pangolin densities (Willcox et al., 2019). However, pangolins are known to use multiple active burrows, i.e., occupying a single burrow for only a few days at a time. It is therefore likely that these estimates are inaccurate as multiple burrows in a survey area in a given time period could be utilised by one pangolin (Willcox et al., 2019). Further research is needed to elucidate the status of *M. crassicaudata* populations in Pakistan.

Sri Lanka – *Manis crassicaudata* is found throughout the lowlands of Sri Lanka, coinciding with the range of termites (Phillips, 1981). In 2012 Sri Lanka assessed *M. crassicaudata* as Near Threatened using IUCN's Red List Categories and Criteria (Ministry of Environment, 2012). Like other pangolin species there has been a paucity of quantitative population data historically, but this is starting to change, and recent research is generating knowledge of the species and its status. Pabasara (2016) reported a population density of 5.69 individuals/km^2 in tropical lowland rainforest, which they acknowledged seems high, especially compared to population densities elsewhere (e.g., Pakistan), but maybe due to habitat differences (Mahmood et al., 2020). Pabasara et al. (2015) further suggested that the species is potentially more abundant in pine-dominated forest, over other habitats, due to a greater abundance of prey. Perera and Karawita (2020) used a combination of methods to confirm the occurrence of *M. crassicaudata* in habitats up to 1850 m above mean sea level in the country, with a higher concentration in the northwest, north-central, southwest lowlands, and southeastern parts of the country. The species was mostly recorded in tropical shrubland, tropical dry forest, tropical moist lowland forest, tropical dry grassland and tropical heavily degraded former forest habitats (Perera and Karawita, 2020). Perera and Karawita (2020) also reviewed contemporary threats to *M. crassicaudata*. They report that the main exploitative threats facing the species are hunting for subsistence and to sell the meat (and possibly, scales), as well as capture in traps intended for other species. This supports prior assertions that exploitation is potentially leading to population declines in some places and may have eliminated pangolins from some parts of the country (Perera et al., 2017; Karawita et al., 2016; Mahmood et al., 2020). Other threats in

Sri Lanka include rapid loss and deterioration of habitats, agricultural expansion, *ad-hoc* use of pesticides and roads (i.e., roadkill) (Chakkaravarthy 2012; Karawita et al., 2016).

Annex 3. Detailed information on the status of African pangolins

Manis tricuspis

Angola (Angola, Cabinda) – There is no information on the abundance or population trends of the species in Angola, and there is very little data on distribution. The species has previously been recorded in northern Angola, including Cabinda, and there are recent records from Cangandala National Park (Beja et al., 2019; Hill and Carter, 1941). Efforts should be made to collate georeferenced observation locations.

Benin – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report that the species ranged from rare to common in different regions but also agreed that populations are likely declining precipitously. The species is listed as Data Deficient and in decline in Benin (Sinsin and Hessou 2004). One study in Lama Forest Reserve (South Benin) recorded 38 *M. tricuspis* at a density of 0.84/km^2 during the dry season in both plantations and natural forest (Akpona et al., 2008). Contemporarily present throughout the south and the center of Benin, including Zou, Collines, Atlantique, Littorale, Mono (Dévé), Couffo, Alibori, Borgou, Atacora, Donga, and Ouémé (e.g., Lama Classified Forest) departments. Prior to 2011, *M. tricuspis* was reported in the Trois Rivieres and Sota Classified Forests (departments of Alibori and Borgou), Upper Ouémé and Monts Kouffè Classified Forests (departments of Borgou and Donga), Agoua Classified Forest (Collines department), and in Pendjari and W Benin national parks and the adjacent hunting areas in the north of Benin. Efforts are needed to collate georeferenced observation locations.

Burkina Faso – Previously recorded by Sayer and Green (1984), although the species was not included by Lamarque (2004) as present in the WAP complex. It is unknown if this species is extant anywhere in Burkina Faso, and effort should be made to verify its presence and status.

Burundi – There is no information about the abundance or population trends in Burundi, and there is very little data on the species distribution, though it has been recorded historically (Verschuren, 1987). It is unknown if this species is extant anywhere in Burundi and effort should be made to verify its presence and status.

Cameroon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, maybe even precipitously so, although it is still considered an abundant species. It was the fourth most harvested species across 47 sites sampled during six months' fieldwork in Cameroon in 2002–2003 (Fa et al., 2006). In south-eastern Cameroon, a density of 0.68 individuals/km² was suggested in a study recording pangolin sightings and evidence of activity (Bobo et al., 2014). The species is common in 7 of the 10 regions of Cameroon (the South, East, Adamawa, Centre, Littoral, Southwest, and Northwest regions) and is most likely distributed throughout the country. Efforts should be made to collate georeferenced observation locations.

Central African Republic (CAR) – There is no information on the abundance or population trends in CAR, and there is very little data on its national distribution. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, though it is still likely quite common throughout its range in the country. Efforts should be made to collate georeferenced observation locations.

Congo – There is no information about the abundance or population trends in Congo, and there is very little data on its distribution in the country. The species has previously been recorded in Nouabale-Ndoki National Park (M. Shirley, unpub. data) and, based on the distribution of suitable habitat, is likely quite widely distributed in the country. Efforts should be made to collate georeferenced observation locations.

Côte d'Ivoire – In response to Notification to the Parties No. 2021/016, Cote d'Ivoire reported that there is insufficient data to determine population trends for this species over the last five years. There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, though in some places can be considered not uncommon. The species is widely distributed, and is likely present throughout the entire country except the very furthest north along the Burkina Faso border and other sites where there is no suitable habitat. Efforts should be made to collate georeferenced observation locations.

Democratic Republic of the Congo (DRC) – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species may be stable or in slight decline and is generally considered to be quite abundant through the vast habitats of DRC. The species is widely distributed throughout the country, including as far east and north as Garamba National Park (Monroe et al., 2015; van Vliet et al., 2015). Efforts should be made to collate georeferenced observation locations.

Equatorial Guinea – There is no information on the abundance or population trends in Equatorial Guinea, and there is very little data on distribution. The species has previously been recorded in Monte Alen National Park and based on the distribution of suitable habitat, is likely quite widely distributed throughout the country. Around the village of Sendje (including within Monte Alén National Park), *M. tricuspis* was the fifth most common mammal species in terms of offtake (Kümpel 2006). Efforts should be made to collate georeferenced observation locations.

Gabon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely stable or even slightly increasing and is considered to be very abundant throughout the country. The species has been historically regarded as the most common pangolin species in Gabon (Pagès 1975) and given the abundance and distribution of suitable habitat, is likely widely distributed throughout the country. Laurance et al. (2006) found that pangolins increased in abundance outside of protected oil concessions in Gabon, possibly in response to greater forest disturbance within concessions. Efforts should be made to collate georeferenced observation locations.

Ghana – The species is known to occur throughout Ghana, with the exception of the northern regions where little is known about the species but there is no quantitative or monitoring-based data on population abundance or trends. The species is believed to be declining in the country (Bräutigam et al., 1994), and range State respondents to the WA BiCC (2020) report agreed that this species is still in decline, and in some areas precipitously so, despite it being common or even abundant in some sites. Boakye et al. (2016) found that *M. tricuspis* represented 82% of the 98 observed pangolins traded by chop-bar operators, wholesalers and farmer-hunters in a study undertaken in Ghana between September 2013 and January 2014. The authors

suggested that the levels of pangolin trade has been underestimated in previous studies as the pangolin bushmeat commodity chain does not form the supply chain to the major bushmeat markets where most previous surveys have been undertaken. They also found that stakeholders close to protected areas traded more pangolins compared to those further away, suggesting that hunters are increasingly focusing their efforts on the nearest protected areas because of greater availability of animals (see also Fa et al., 2006; Schulte-Herbrüggen et al., 2013). This is the most recorded pangolin species in bushmeat surveys and traditional medicine markets (Boakye et al., 2015; Boakye et al., 2016). Hunters in villages in the Ashanti region of the Upper Guinea Forest Ecosystem reported in 2011 that *M. tricuspis* were rare (Alexander et al., 2015), although they were considered common by more than 70% of hunters (n = 35) in the Akposa Traditional Area in the Volta Region (Emieaboe et al., 2014). Efforts should be made to collate georeferenced observation locations.

Guinea – There is no quantitative or monitoring-based data on population abundance or trends. The species is believed to be declining in Guinea (Bräutigam et al., 1994), and range State respondents to the WA BiCC (2020) report agreed that this decline is ongoing despite the species appearing to be fairly common. The species is present in Forestiere, Moyenne, Guinea Martine, and Upper Guinea regions. Efforts should be made to collate georeferenced observation locations.

Guinea-Bissau – There is no information about the abundance or population trends in Guinea-Bissau, and there is very little data on distribution. The species has previously been recorded in Cantanhez National Park (Bout and Ghiurghi, 2013). Efforts should be made to collate georeferenced observation locations.

Kenya – There is no information about the abundance or population trends in Kenya, and there is very little data on distribution. Kenya represents the extreme eastern distribution, where the species is found in the southwest, including in the Kakamega Forest Reserve (Roth and Cords, 2015). Efforts should be made to collate georeferenced observation locations.

Liberia – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is abundant, even very abundant, but likely declining in status. The species is widely distributed throughout

the country, especially in the southeast and northwest, including Gbarpolu county, Sinoe county, and Grand Gedeh. Efforts should be made to collate georeferenced observation locations.

Mali – There are no confirmed records, but the recent documentation of *M. tetradactyla* in Mali suggests that *M. tricuspis* may be present (WA BiCC, 2020). It is unknown if this species is extant anywhere in Mali, and efforts should be made to verify its presence and status.

Niger – Previously recorded by Sayer and Green, 1984, although the species was not included by Lamarque (2004) as present in the WAP complex. It is unknown if this species is extant anywhere in Niger, and efforts should be made to verify its presence and status.

Nigeria – There is no quantitative or monitoring-based data on population abundance or trends and Nigeria reported in response to Notification to the Parties No. 2021/016 that the species is data deficient. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, in some cases precipitously so, though it still may be common in some areas. This species is regarded as the most common pangolin species in Nigeria (Angelici et al., 1999). Soewu and Adekanola (2011) report that 92% of traditional Yorubic-medical practitioners among the Awori people in Ogun State, Nigeria, believe that the abundance of pangolins is steadily decreasing while more than 97% reported a continuous decline in the size of pangolins caught. Soewu and Ayodele (2009) report that dealers in traditional medicine ingredients in public markets in Ijebu province, Nigeria, had an average sale figure of 1.06 *M. tricuspis* carcasses per dealer per month, and on this basis suggest that the species is being exploited unsustainably. The first of these authors also reported a decline in both the size and abundance of *M. tricuspis* in bushmeat markets in Nigeria, and an associated increase in the prevalence of *M. tetradactyla* in these markets, suggesting that *M. tricuspis* is becoming increasingly scarce (Pietersen et al., 2019a; WA BiCC, 2020). In Southwest Nigeria, hunters' reports and evidence of forest destruction suggest that the species is becoming rare (Sodeinde and Adedipe, 1994). The species is distributed throughout most of southwestern states, and there is evidence for its presence in some southeastern states, including Cross River State and the Cross River National Park (Anadu et al., 1988; Happold, 1987), as well as the Gashaka Local Government Area (LGA), Afi Mountain Wildlife Sanctuary, and Mbe Mountains, among others. Efforts should be made to collate georeferenced observation locations.

Rwanda – There is no information about the abundance or population trends in Rwanda, and there is very little data on distribution. Though it has previously been recorded, it is believed to be close to extinction in Rwanda (Bräutigam et al., 1994). Efforts should be made to collate georeferenced observation locations.

Sierra Leone – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is declining, though may be common to abundant in some areas. Present throughout the country, especially the Eastern Province, the species is likely declining in the Portloko and part of the Tonkolili Districts due to loss of habitat. Efforts should be made to collate georeferenced observation locations.

South Sudan – There is no information about the abundance or population trends in South Sudan, and there is very little data on distribution. The species has previously been recorded in the forested areas of south-western South Sudan bordering Uganda and the Democratic Republic of Congo (Hillman, 1982). Efforts should be made to collate georeferenced observation locations and determine the status of the species in South Sudan.

Togo – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, though can still be considered common or even abundant in some areas. The species is present in the Plateau and Central Regions, including the Fazao Malfakassa National Park, Abdoulaye Wildlife Reserve, Assoukoko Forest Reserve, Togodo Protected Areas complex, ecological units of ecological zone IV of the country (the forest of Deux Béna (Akloa)), the community forest of Yikpa-Dzigbe, forest of Assime, and probably in the forest of Missahohe.

Uganda – There is no quantitative or monitoring-based data on population abundance or trends. The species is thought to be declining rapidly due to being targeted for bushmeat and international trade in derivatives (Kityo et al., 2016) and was assessed as Endangered nationally in Uganda in 2016, using the IUCN Red List Categories and Criteria (Kityo et al., 2016). Efforts should be made to collate georeferenced observation locations.

United Republic of Tanzania – There is no quantitative or monitoring-based data on population abundance or trends. The species is considered rare in the United Republic of Tanzania, which is on the very edge of its range. In recent research, pangolins were encountered on 2 out of 1,500 camera trap nights in Minziro Forest (Tim Davenport, *in litt.* to the authors, 2017). The species is also known from close to Bukoba (Foley et al., 2014).

Zambia – There is no information about the abundance or population trends in Zambia, and there is very little data on distribution. The species has previously been recorded in northwestern (near Solwezi) and central (Serenje) Zambia close to the DRC border (Jansen et al., 2020). Efforts should be made to collate georeferenced observation locations.

Manis tetradactyla

Angola – There is no definitive confirmation that this species is present in Angola, though its presence in the Bas-Congo province of Congo (Schouteden, 1944) suggests that it should be at least found in Cabinda. Several significant references to the biodiversity of Angola do not mention this species (e.g., Beja et al., 2019; Bocage, 1889, 1890; Hill and Carter, 1941; Machado, 1969; Thomas, 1904). However, other authors have suggested that the species should occur as far south as the Kunene River (Monard, 1935) and Moçamedes (Mohr, 1961), and Feiler (1990) includes them in his checklist, noting that they were first recorded prior to 1990, but none of these authors cite accessioned specimens or observation locality. Effort should be made to determine if this species occurs in Angola, where, and if it is extant in Cabinda.

Benin – There is no information on this species in Benin, where it is not likely present. Effort should be made to verify if the species is present, and if so, its status in the country.

Cameroon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, precipitously in some areas, though it is likely still common throughout the country. Based on the distribution of suitable habitat, it is also likely still quite widely distributed. Efforts should be made to collate georeferenced observation locations.

Central African Republic (CAR) – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, though it appears to be not uncommon. Very little data is available on the extent of this species' distribution in CAR, and the extent to which is it more widely distributed beyond the forested southeast (e.g., Dzanga-Sangha National Park and surrounding protected areas and non-protected suitable habitats) is uncertain. Efforts should be made to collate georeferenced observation locations.

Congo – There is no information about the abundance or population trends in Congo, and very little data on distribution. Based on the distribution of suitable habitat, the species is likely quite widely distributed throughout the country and potentially quite abundant. Efforts should be made to collate georeferenced observation locations.

Côte d'Ivoire – In response to Notification to the Parties No. 2021/016, Cote d'Ivoire reported that there is insufficient data to determine population trends for this species over the last five years. There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is declining, though at an unknown rate. The species is widely distributed, and likely present throughout all but the very far north of the country along the Burkina Faso border and other sites where there is no suitable habitat. Efforts should be made to collate georeferenced observation locations.

Democratic Republic of the Congo (DRC) – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely stable and common to abundant throughout the country. Confirmed in Nord-Kivu, Sud-Kivu, Maniema, Tshopo, and Mai-Ndombe provinces (Kutu, Oshwe, and Kiri territories); and, based on the distribution of suitable habitat, the species is likely quite widely distributed throughout the country. Efforts should be made to collate georeferenced observation locations.

Equatorial Guinea – There is no information about the abundance or population trends in Equatorial Guinea, and there is very little data on distribution. Based on the distribution of suitable habitat, it is likely quite widely distributed throughout the country and may potentially

remain a common species. Efforts should be made to collate georeferenced observation locations.

Gabon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely stable or even slightly increasing, and is considered to be abundant throughout the country. Based on the abundance and distribution of suitable habitat, it is likely widely distributed throughout the country. Efforts should be made to collate georeferenced observation locations.

Ghana – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, precipitously in some areas, though it is still likely not uncommon in areas of suitable habitat. With the exception of the northern regions, where not much is known about the species, *M. tetradactyla* is known throughout Ghana, especially the forested regions, although there are few records. Boakye et al. (2016) reported that *M. tetradactyla* represented 18% of the 98 observed pangolins traded by chop-bar operators, wholesalers and farmer-hunters in a study undertaken in Ghana between September 2013 and January 2014. In 2017, *M. tetradactyla* was reported in the Amanzule Wetlands and along the Tano River in the Techiman Municipality. They are known from the Ankasa Conservation Area, Bawdie (bushmeat market in the Wassa Amenfi East Municipal of the Western Region), Kakum Conservation Area (Ghana Wildlife Division, 1996; Nik Borrow, unpubl. data), and adjacent forest reserves (bushmeat markets at Assin Fosu and Assin Adiembra). Efforts should be made to collate georeferenced observation locations.

Guinea – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is declining, though it is likely common throughout the country. Present in Forestiere, Moyenne, and Guinea Martine regions; the prefectures of Yomou, Macenta, N'Zérékoré, and Lola; and Fouta Djallon of the Kankan region up to the Mali border (I. Edwards, pers. comm., 2020). Based on the abundance and distribution of suitable habitat, the species is likely widely distributed throughout the country. Efforts should be made to collate georeferenced observation locations.

Guinea-Bissau – There is no information on this species in Guinea-Bissau, where it is not likely present. Reiner and Simões (1999) considered the presence of *M. tetradactyla* possible, but there is no confirmatory evidence. Effort should be made to verify if this species is present in Guinea-Bissau and if so, its status.

Liberia – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is declining, though it is likely common throughout the country. Based on the abundance and distribution of suitable habitat, it is likely widely distributed throughout the country, especially in the southeast and northwest, including Gbarpolu county, Sinoe county, and Grand Gedeh. Efforts should be made to collate georeferenced observation locations.

Mali – There is no information about the abundance or population trends in Mali, and there is very little data on distribution. The species has previously been recorded in the Sikasso region south of Misseni near the Mali-Côte d'Ivoire border, and in western Mali in the Gangaran and Bafing territories south into the Fouta Jallon Highlands along the Mali-Guinea border (I. Edwards, pers. comm., 2020). Efforts should be made to collate georeferenced observation locations.

Nigeria – There is no quantitative or monitoring-based data on population abundance or trends. Nigeria reported in response to Notification to the Parties No. 2021/016 that the species is data deficient. Range State respondents to the WA BiCC (2020) report agreed that this species is declining precipitously and appears to be rare in the country. Found through most of the mangrove forests in southern Nigeria, including Rivers, Cross River, Delta, Bayelsa, and Akwa-Ibom States; and in Oban and Okwangwo divisions of the Cross River National Park. The species may be present in Gashaka Local Government Area (LGA), Toungo LGA, Saki East, Atisbo, and New Bussa. Efforts should be made to collate georeferenced observation data.

Senegal – There is no information on this species in Senegal, where it is not likely present. Effort should be made to verify if the species occurs in the country and if so its status, especially in the extreme southeast in the forested regions near Guinea and Mali.

Sierra Leone – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, even precipitously in some areas, and appears to be uncommon in the country. The species is present in Koinadugu, Falaba, Karine, and Eastern Province. Previous authors have considered the Western Area Peninsula Forest National Park to be the westernmost distribution (Grubb et al., 1998). Efforts should be made to collate georeferenced observation locations.

South Sudan – There is no information on this species in South Sudan, where it is not likely present. Effort should be made to verify if the species occurs in the country and if so its status, particularly in the forested south of the country where *M. tricuspis* and *M. gigantea* have been recorded.

Togo – There is no information on this species in Togo, where it is not likely present. Effort should be made to verify if the species occurs in the country and if so its status.

Uganda – It is uncertain whether this species is present in Uganda where it was assessed as Endangered at the national level in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016). Further investigation is warranted in the Semliki Valley, a well-known refuge of Congolese fauna and flora in East Africa where both *M. tricuspis* and *M. gigantea* occur (Gudehus et al., 2020).

Manis gigantea

Angola – It is unclear if *M. gigantea* is present in Angola. There is no mention of the species in critical references to Angolan biodiversity (e.g., Bocage, 1889, 1890; Monard, 1935; Hill and Carter, 1941; Machado, 1969). As for *M. tetradactyla*, Feiler (1990) suggests that the species is present but without any indication to source, specimen, or site. There are several passing references to occurrence in the forests of Cabinda, particularly Maiombe, so it seems reasonable to include them in the country's fauna (Kingdon et al., 2013; Beja et al., 2019 and references therein). Efforts should be made to confirm whether this species is present, or not.

Benin – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species status is

uncertain in Benin, being last recorded from the Pendjari National Park area in 2013. Prior to 2013, *M. gigantea* was recorded from Batia on the border of Pendjari National Park (Sayer and Green, 1984), even in Pendjari (Verschuren, 1988), and likely most areas in northern Benin (Akpona and Daouda, 2011). The species has not been recorded in recent surveys, including camera trapping work across W-Arly-Pendjari (Harris et al., 2019; ZSL, unpubl. data). *Manis gigantea* was recently reported by local hunters in the Alibori forest near the village of Gonroukayemia (Zanvo et al., 2020). If still present in Benin, the species is likely incredibly rare and in precipitous decline. Efforts should be made to confirm whether this species is locally extinct or not.

Burkina Faso – There is no information on this species in Burkina Faso, where it is not likely present. Sayer and Green (1984) did refer to observations of *M. gigantea* in the country. Effort should be made to verify if this species is present in Burkina Faso and if so, its status, particularly in the WAP complex of protected areas.

Cameroon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that the species is likely in precipitous decline, though there was considerable disagreement about how common it is, with opinions ranging from rare to abundant throughout the country. The presence of the species has been confirmed in the South, East, Centre, Littoral, Southwest, North, and Adamaoua regions. Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across Cameroon. Efforts should be made to collate georeferenced observation locations.

Central African Republic (CAR) – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is declining and likely increasingly rare where it occurs in the country. It has been recorded in the forested areas in the south and southwest, and as far north as the Zemongo Faunal Reserve (Roulet et al., 2007). Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across CAR. Efforts should be made to collate georeferenced observation locations.

Congo – There is no information about the abundance or population trends in Congo, and there is very little data on distribution. This species is, or at least was, regularly recorded in bushmeat surveys, especially throughout the north of the country (e.g., Ouesso, Pokola) and, based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across Congo. Efforts should be made to collate georeferenced observation locations.

Côte d'Ivoire – In response to Notification to the Parties No. 2021/016, Cote d'Ivoire reported that there is insufficient data to determine population trends for this species over the last five years. There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining precipitously and likely increasingly rare where it occurs in the country. The species was historically widely distributed, and likely present throughout the entire country, but now is only recorded with any reliability in Taï and Comoe National Parks, though the species seems to be rare in the latter. Efforts should be made to collate georeferenced observation locations.

Democratic Republic of the Congo (DRC) – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report disagreed over population trends, with responses ranging from stable to precipitous declines. There was similar disagreement over how common the species is, with opinions ranging from uncommon to very abundant. There is likely considerable regional variation within DRC driving this variation. The northern banks of the Kasai and Tshuapa Rivers apparently define its southern limits within the central forest block (Kingdon et al., 2013). Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across DRC. The species has generally confirmed to be present in Nord-Kivu, Sud-Kivu, Maniema, Tshopo, and Mai-Ndombe provinces (Kutu, Oshwe, and Kiri territories). Efforts should be made to collate georeferenced observation locations.

Equatorial Guinea – There is no information about the abundance or population trends in Equatorial Guinea, and there is very little data on distribution. Previous records of this species from the island of Bioko (e.g. Kingdon et al., 2013) are thought to stem from records of carcasses imported from the mainland (Hoffmann et al., 2015). Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across Equatorial Guinea. Efforts should be made to collate georeferenced observation locations.

Gabon – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, even precipitously so in some sites, though it is likely not uncommon. Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across Gabon. There are some seemingly anomalous distributional and abundance patterns that are not yet fully understood; for example, why this species seems to be abundant in the Wonga Wongue Presidential Reserve but very rare in the Loango National Park, both coastal protected areas with relatively similar forest habitats. Efforts should be made to collate georeferenced observation locations.

Ghana – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species status is uncertain in Ghana, being last recorded in the early 2000s. It was recorded as far north as Mole National Park (Grubb et al., 1998). The species has previously been recorded in the Ankasa Conservation Area (Ghana Wildlife Division, 2000) and Kakum Conservation Area (Roell et. al., 1993). While not yet confirmed, *M. gigantea* is suspected to occur in a sacred grove in the Twifo Ati Mokwa district of the Central Region (D. Konzin, unpubl. data, 2017). If the species is still present in Ghana, it is likely incredibly rare and in precipitous decline. Efforts should be made to confirm whether this species is locally extinct or not.

Guinea – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining precipitously, though potentially not uncommon around the country. This species has been confirmed to be present in Forestiere and Haut Guinea regions, Tougaly (Kansangui management area) in the Tougué prefecture, and the Fouta Djallon of the Kankan region up to the Mali border. Based on the availability of suitable habitat, it is likely that *M. gigantea* is, or was, widely distributed across Guinea. Efforts should be made to collate georeferenced observation locations and confirm the presence and status of the species, especially in the protected areas of the country.

Guinea-Bissau – There is no information about the abundance or population trends in Guinea-Bissau, and there is effectively no data on distribution. Effort should be made to verify if this species is still present and determine its status.

Kenya – There is no information about the abundance or population trends in Kenya, and there is very little data on distribution. The species has been observed in west Kenya close to the Uganda border (Kingdon, 1971) but recent records are lacking. Efforts should be made to collate georeferenced observation locations and confirm the presence and status of the species in the protected areas of the western regions of this country.

Liberia – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, though potentially not uncommon around the country. Efforts should be made to collate georeferenced observation locations and confirm its continued presence and status, especially in the protected areas of this country.

Mali – There is no information on *M. gigantea* though the species is likely to be present in western Mali in the Gangaran, including near Kita, and Bafing territories south into the Fouta Jallon Highlands along the Mali-Guinea border (I. Edwards, pers. comm., 2020). Effort should be made to verify the presence of the species, and its status, in Mali, particularly throughout the forested south and southwest of the country.

Niger – There is no information on *M. gigantea* which is not likely present. The species was reported from W National Park in the 1970's (Poche, 1973), though was later reported to be locally extinct by Bräutigam et al. (1994). Effort should be made to verify if this species is present and Niger, and its status, particularly in the WAP complex of protected areas.

Nigeria – There is no quantitative or monitoring-based data on population abundance or trends. Nigeria reported in response to Notification to the Parties No. 2021/016 that the species is data deficient. Range State respondents to the WA BiCC (2020) report agreed that this species is incredibly imperiled in Nigeria and likely all but extinct in the wild. If it is still present, the species is likely incredibly rare and in precipitous decline. The species was camera trapped in Gashaka Gumti National Park in the east of the country in 2016 (S. Nixon, unpubl. data);

ongoing surveys in Cross River National Park have failed to record the species (A. Dunn, unpubl. data). In 2017, giant pangolins were observed in the Omo Forest Reserve (Taraba State), and recently reported by a hunter in the Oban Division of Cross River National Park. Efforts should continue trying to establish this species' status and distribution in Nigeria.

Rwanda – There is no information about the abundance or population trends in Rwanda, and there is very little data on distribution. It was believed extinct in Rwanda (Bräutigam et al., 1994) until recent camera trap information confirmed its presence in Akagera National Park in the east of the country (D. Bantlin, unpubl. data). Efforts should be made to collate georeferenced observation locations and confirm the presence of the species and its status, especially in the protected areas in this country.

Senegal – There is no information on *M. gigantea* in Senegal and the presence of the species here is highly uncertain. Effort should be made to verify the presence of the species and its status in Senegal, particularly in the area of Niokolo Koba National Park.

Sierra Leone – There is no quantitative or monitoring-based data on population abundance or trends. Range State respondents to the WA BiCC (2020) report agreed that this species is likely declining, and it is uncommon around the country. The species is present in the Koinadugu, Falaba, Bambali, Kono, and Karine Districts, as well as the Eastern Province and, based on the availability of suitable habitat is likely to be more widely distributed. Efforts should be made to collate georeferenced observation locations and confirm the presence of the species and its status, especially in the protected areas of this country.

South Sudan – There is no information about the abundance or population trends in South Sudan, and there is very little data on distribution. However, the species' presence has been confirmed in southwest South Sudan, near the DRC border (D. Reeder, unpubl. data). Efforts should be made to collate georeferenced observation locations and confirm the presence of the species and its status, especially in the forested south of this country.

Togo – There is no information on *M. gigantea* in Togo though it is likely the species was present historically. Grubb et al. (1998) map older records from Ghana on the border with Togo near the Fazao-Malfakassa National Park. There is no recent information from Togo (Amori et

al., 2016), and effort should be made to verify if this species is still present, particularly throughout the central and northern regions of the country.

Uganda – *Manis gigantea* was assessed as Endangered nationally in Uganda in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016). The CITES Management Authority reported a national population estimate, based on unpublished government data, of approximately 2,000 individuals, with densities of up to 0.03/km^2 (CITES, 2016). In its response to Notification to the Parties No. 2014/059, Uganda reported records of *M. gigantea* in the Ayago area of Murchison Falls National Park, near the location of a proposed hydroelectric power station. The species has been recorded from Itwara and Kibego Matiiri Forest Reserves in Uganda, but their low relative abundance suggests that they are not faring well in these small, highly perturbed forest reserves compared to large protected areas (Mugume et al., 2015). Kityo et al., (2016) similarly report that the species was probably widespread in Uganda in the mid-1990s but now very likely only survives in healthy populations within protected areas. Since 2015, *M. gigantea* has been recorded through central Uganda as far east as the Kenyan border around the shores of Lake Victoria (N. Matthews and S. Nixon, unpubl. data). The scales of the species are widely used in traditional medicine in Uganda and are commonly found for sale, in small quantities, in >1,000 sub-county level markets. Collectively, these comprise a substantial trade. No updated information was provided in 2021 in response to Notification to the Parties No. 2021/016. Efforts should be made to collate georeferenced observation locations.

United Republic of Tanzania – There is no information about the abundance or population trends in Tanzania, and there is very little data on distribution. *Manis gigantea* is thought to occur only in the Minziro Forest Nature Reserve, Mahale Mountains National Park, Issa Valley, and the Gombe National Park where, for the latter three, there are camera-trap records (Kingdon et al., 2013). Research conducted in Mahale revealed an encounter rate of seven out of 663 camera trap nights confirming the species' presence, though it is considered much rarer in Minziro (Tim Davenport, *in litt.* to the authors, 2017). There is some suspicion that the species should occur in Tembwa, Ntakatta, and other forested sites along the Tanganyika lakeshore to the south. Efforts should be made to collate georeferenced observation locations and confirm the presence and status of the species in the country.

Manis temminckii

Angola (Angola) – There is no information about the abundance or population trends in Angola, and there is very little data on distribution. Southern Angola represents the western limit of this species range. It occurs in the central and southern regions, and there are records from Benguela, Bié, Caconda, Cuanza-Sul, Chitaeu, Cuando-Cubango, Huíla, Mombolo, and areas adjacent to Namibe (Beja et al., 2019; Hill and Carter, 1941; Meester, 1972; Monard, 1935). Efforts should be made to collate georeferenced observation locations and confirm the presence and status of the species in the country.

Botswana – In response to Notification to the Parties No. 2021/016, Botswana reported that there is insufficient data to determine population trends for this species over the last five years. There is no quantitative or monitoring-based data on population abundance or trends. Based on the availability of suitable habitat, it is likely *M. temminckii* is widely distributed. Efforts should be made to collate georeferenced observation locations and confirm its status.

Burundi – There is no information about the abundance or population trends in Burundi, and there is very little data on distribution. Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

Central African Republic (CAR) – There is no information about the abundance or population trends in CAR, and there is very little data on distribution. Recorded from Ouanda Djallé in the northeast and purportedly in Chinko Wildlife Refuge, the species reportedly occurs widely in this region (Malbrant, 1952). Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

Chad – There is no information about the abundance or population trends in Chad, and there is very little data on distribution. Recorded from the southeast of the country, as well as the Ennedi plateau in the northeast (Malbrant, 1952). Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

Democratic Republic of the Congo (DRC) – There is no information about the abundance or population trends in DRC, and there is very little data on distribution. Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

eSwatini – The species is believed to have been extirpated from eSwatini (Pietersen *et al.* 2016). Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

Ethiopia – There is no information about the abundance or population trends in Ethiopia, and there is very little data on distribution. Confirmed from the Omo River basin region of southwest Ethiopia (Schloeder and Jacobs, 1996; Swart 2013) and also likely occurs in the western border regions (Yalden et al., 1996). Efforts should be made to collate georeferenced observation locations and confirm the continued presence and status of the species in the country.

Kenya – There is no information about the abundance or population trends in Kenya, and there is very little data on distribution. Widely distributed, but seemingly absent from the east and northeast regions. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Malawi – There is no information about the abundance or population trends in Malawi, and there is very little data on distribution. The species has primarily been recorded in the south, but is believed to occur throughout the country (Ansell and Dowsett, 1988; Smithers, 1966; Sweeney, 1959). Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Mozambique – In response to Notification to the Parties No. 2021/016, Mozambique reported that there is insufficient data to determine population trends for this species over the last five years. There is no quantitative or monitoring-based data on population abundance or trends. Informal observations suggest that different local populations vary widely in status from declining, to stable and even increasing, though the latter is based on the assumptions of more

law-enforcement leading to less poaching. Protected area managers' report stable populations, though there is no data on which to base this conclusion. The CITES Management Authority of Mozambique ultimately determined that, because of habit loss, poaching, and trafficking the species is likely declining. *Manis temminckii* is distributed widely throughout the country. There is a single conservation program focused on the species in Gorongosa National Park, which started in 2019. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Namibia – In response to Notification to the Parties No. 2021/016, Namibia reported that the population is believed to be increasing; however, there is apparently no quantitative or monitoring-based data on population abundance or trends. Namibia reports that there is an ongoing study which aims to determine the distribution of pangolin in the country and that this data will be used to develop a management plan. This is in contrast to what was reported in response to Notification to the Parties No. 2014/05 and 2017/035, when Namibia reported that the impact of illegal trade on the species cannot be determined as there is insufficient data on the population status of the species. Cases of illegal possession of pangolins in the country over the past year (i.e., within 2020–2021) have been minimal. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Rwanda – There is no information about the abundance or population trends in Rwanda, and there is very little data on distribution. Widely distributed, but seemingly absent from the east and northeast regions. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

South Africa – In response to Notification to the Parties No. 2014/05, South Africa reported that moderate levels of illegal trade occur in the country, although the extent of this trade is difficult to monitor and quantify. It is unknown whether the animals involved are being located and taken from the wild or are from roadkill or electric fence mortalities, though it is suspected that animals are obtained from all three of these sources. No updated information was provided in 2021 in response to Notification to the Parties No. 2021/016. Nonetheless, South Africa likely has the most comprehensive knowledge of any pangolin species in Africa. It was assessed as Vulnerable in southern Africa (South Africa, Swaziland and Lesotho) in 2016 (Pietersen et al., 2016), Pietersen et al. (2016) estimated the total mature population size to be

between 7,002 and 32,135 individuals, with a most likely estimate of 16,329–24,102 individuals. The total density in the Kruger National Park region has been estimated at 0.24/km² (Swart, 2013). A more recent study in Northern Cape Province, South Africa, estimated total density as 0.23–0.31/ km^2 (Pietersen et al., 2014). The extent of occurrence has been reduced by an estimated 9–48% over 30 years (1985 to 2015), due to presumed local extinction from the Free State, Eastern Cape and much of southern KwaZulu-Natal provinces in South Africa (Pietersen et al., 2016). These authors assert that the southern African population of *M. temminckii* likely acts as a source for neighbouring countries, especially as the majority of neighbouring populations are more affected by both local and international legal and illegal trade due to more relaxed wildlife laws and generally lower levels of law enforcement.

South Sudan – There is no information about the abundance or population trends in South Sudan, and there is very little data on distribution. The species is widely distributed, but seemingly absent from the east and northeast regions. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Sudan – There is no information about the abundance or population trends in Sudan, and there is very little data on distribution. In response to a request for information and collaboration regarding Decision 18.239, the Sudan CITES Management Authority responded stating that Sudan is not a pangolin range State. However, this species has been historically recorded from Kadugli in the Nuba Mountains (Sweeney, 1956, 1974) and it has been collected in the Sennar region, close to the Ethiopian border (Yalden et al., 1996). Efforts should be made to determine if *M. temminckii* is still present in Sudan and determine and the status of the species.

Uganda – There is no information about the abundance or population trends in Uganda, and there is very little data on distribution. In its response to Notification to the Parties No. 2014/059, Uganda reported records of *M. temminckii* in the Ayago area of Murchison Falls National Park, near the location of a proposed hydroelectric power station. The species also occurs in Kidepo Valley National Park. It is thought to survive in healthy populations only within protected areas (Kityo et al., 2016), and was assessed as Vulnerable nationally in Uganda in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016). Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

United Republic of Tanzania – There is no information about the abundance or population trends in the United Republic of Tanzania, and there is very little data on distribution. This species is thought to be widespread but is rare and occurs at higher densities in protected areas (Tim Davenport, *in litt.* to the authors, 2017). Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Zambia – There is no information about the abundance or population trends in Zambia, and there is very little data on distribution. Although absent from large tracts of central and northern Zambia, there are records of the species in western, southern, central, and eastern regions of the country (Ansell, 1960, 1978; Smithers, 1966). The species does not occur in the forested regions of extreme north-western Zambia. Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Zimbabwe – In response to Notification to the Parties No. 2021/016, Zimbabwe reported that there have been reports of pangolin sightings and releases of pangolins in some of the major Protected Areas, such as Hwange and Gonarezhou National Park. They also reported that *M. temminckii* is likely stable but may be declining in the country, as reported anecdotally from rangers in the field. They report that there are no current conservation or monitoring programme, but have plans to start such a programme in 2021. There is generally no other quantitative or monitoring-based data on population abundance or trends, though the total density in the Gokwe district has been previously estimated at 0.11/km^2 (Heath and Coulson, 1997; Pietersen et al., 2014); however, populations are thought to have decreased since this time (L. Hywood and E. Connelly, unpubl. data). Efforts should be made to collate georeferenced observation locations and confirm the status of the species in the country.

Annex 4. Asian pangolin trade data.

Non-shaded = direct trade. Shaded = re-exports.

Year	Importer	Exporter	Origin	Importer reported quantity	Exporter reported quantity	Term	Unit	Purpose	Source
M. pentadactyla									
2014	SG	HK		10		specimens		S	W
2016	DE	TW		2		live		B	W
2016	KP	CN			1	bodies		E	U
2018	US	CN		1		medicine		T	I
2018	US	VN		1985		medicine		P	I
2014	CA	US	CN		1	specimens		S	W
2014	CA	US	IN		1	specimens		S	W
2014	CA	US	LA		3	specimens		S	W
2014	FR	US	CN		4	specimens		S	W
2014	FR	US	IN		8	specimens		S	W
2014	FR	US	LA		2	specimens		S	W
2014	FR	US	NP		1	specimens		S	W
2014	FR	US	VN		2	specimens		S	W
2014	US	CN	XX	11443		medicine	g	T	I
2014	US	VN	XX	60		medicine		T	I
2015	FR	US	NP		1	specimens		S	W
2015	US	CN	XX	16		medicine		P	I
2016	US	TH	XX	80		medicine		P	I
2017	FR	US	TW		1	specimens		S	W
2017	US	VN	XX	24		medicine		T	I
2018	FR	US	XX		12	specimens		S	W
2018	US	FR	TW	1		specimens		S	W
M. javanica									

	2015	US	SG		3	specimens		S	W
	2016	US	SG		2	specimens		S	W
	2017	GB	SG		145	specimens	g	S	F
	2014	CA	US	LA	1	specimens		S	W
	2014	CA	US	MY	2	specimens		S	W
	2014	FR	US	LA	1	specimens		S	W
	2014	FR	US	MY	3	specimens		S	W
	2014	US	NL	ID	1	garments		T	O
	2014	US	NL	ID	1	skins		P	O
	2015	FR	US	ID	1	specimens		S	W
	2017	GB	SG	XX	1547	specimens	g	S	W
	2018	FR	US	SG	1	specimens		S	W
	2018	KR	NL	XX	2	scales		E	O
	2019	ID	NL	XX	2	carvings		E	O
M. culionensis									
	2014	CA	US	PH	2	specimens		S	W
	2014	FR	US	PH	3	specimens		S	W
	2015	FR	US	PH	5	specimens		S	W
M. crassicaudata									
	2014	FR	US		6	specimens		S	C
	2014	CA	US	IN	2	specimens		S	W
	2014	CA	US	LK	1	specimens		S	W
	2014	CH	CA	CN	7	specimens	ml	M	C
	2014	FR	US	IN	1	specimens		S	C
	2014	FR	US	IN	1	specimens		S	W
	2014	FR	US	LK	2	specimens		S	W
	2014	FR	US	XX	1	specimens		S	C
	2015	FR	US	LK	1	specimens		S	W
	2015	US	GB	XX	1	bodies		T	O
Manis spp. exported from Asian pangolin range states									

	2014	US	CN		4		medicine		P	I
	2015	US	CN		2		medicine		P	I
	2015	US	CN		148		medicine		T	I
	2015	US	ID		48		medicine		P	I
	2015	US	VN		30		medicine		P	I
	2015	US	VN		29		medicine		T	I
	2015	ZA	HK		27.882		scales	kg	S	U
	2016	US	CN		15		medicine		T	I
	2016	US	VN		454		scales	g	T	I
	2017	US	CN		1		medicine		T	I
	2017	US	KH		1		scales	kg	P	I
	2017	US	VN		1440		medicine		P	I
	2017	ZA	HK		12.8		scales	kg	S	I
	2018	US	CN		60		fur product (small)		P	I
	2018	US	LA		0.008		scales	kg	P	I
	2018	US	TH		2		scales	kg	T	I
	2018	US	VN		1980		medicine	ml	P	I
	2018	US	VN		583		medicine		P	I
	2018	US	VN		20		medicine		T	I
	2014	FR	US	VN		2	specimens		S	W
	2015	US	VN	CN	30		medicine		P	I
Manidae spp. from Asian pangolin range states										
	2017	ZA	HK		14.8		scales	kg	L	I

Annex 5. African pangolin trade data. Non-shaded = direct trade. Shaded = re-exports.

Year	Importer	Exporter	Origin	Importer reported quantity	Exporter reported quantity	Term	Unit	Purpose	Source
Manis tricuspis									
2014	CN	CD		750		scales	kg	T	W
2014	CN	TG			10	live		T	W
2014	DE	CI		3	3	specimens		S	W
2014	DE	LR		2		scales		S	W
2014	DE	LR		1		specimens		S	W
2014	JP	TG			10	live		T	W
2014	MY	TG			6	live		T	W
2014	OM	TG			10	live		T	W
2014	US	TG			34	live		T	W
2014	ZA	NG			1	specimens		M	W
2014	ZA	NG		20		specimens		S	W
2015	CN	CD		200		scales	kg	T	W
2015	CN	CG		1000		scales	kg	T	W
2015	CN	NG		200		live		B	W
2015	DE	CI		10	10	specimens		S	W
2015	FR	CI			10	specimens	ml	S	W
2015	FR	CI		2		specimens		S	W
2015	JP	TG			5	live		T	W
2015	US	TG		17	22	live		T	W
2015	ZA	CF		276		scales		S	U
2015	ZA	CF		3		skin pieces		S	U
2015	ZA	CF		6		specimens		S	U
2015	ZA	FR		2		specimens		S	U
2016	CN	CG		500		scales	kg	T	W
2016	FR	GA		53		scales		S	W

	2016	GB	BJ			11	live		T	W
	2016	JP	TG			5	live		T	W
	2016	TZ	ZA			500	scales	g	L	I
	2016	US	LR			1	skins		H	W
	2016	US	LR		1		skins		P	W
	2016	US	TG			51	live		T	W
	2016	US	TG		46		live		Z	W
	2016	ZA	NG		8		specimens		S	W
	2017	CN	CG		5000		scales	kg	T	W
	2018	CZ	CG		42		specimens		S	W
	2018	MY	ZA			1	specimens	ml		C
	2019	DE	CF		450		specimens		S	W
	2019	DE	CI		100		specimens		S	W
	2014	CA	US	CD		2	specimens		S	W
	2014	CA	US	NG		1	specimens		S	W
	2014	CA	US	TZ		1	specimens		S	W
	2014	FR	US	CD		2	specimens		S	W
	2014	FR	US	CM		1	specimens		S	W
	2014	FR	US	GH		5	specimens		S	W
	2014	FR	US	NG		4	specimens		S	W
	2014	FR	US	TZ		1	specimens		S	W
	2015	ZA	DK	XX	2		skin pieces		S	W
	2017	FR	US	SL		1	specimens		S	W
	2018	FR	US	KE		1	specimens		S	W
	2018	FR	US	LR		1	specimens		S	W
	2018	FR	US	SL		1	specimens		S	W
	2018	US	FR	SL	1		specimens		S	W
Manis tetradactyla										
	2014	DE	CI		1	1	specimens		S	W
	2014	US	TG			8	skins		T	W

	2015	CN	NG		200		live		B	W
	2015	CZ	TG			5	live		T	W
	2015	FR	CI			65	specimens	ml	S	W
	2015	FR	CI		13		specimens		S	W
	2015	ZA	CF		6		scales		S	U
	2015	ZA	FR		4		specimens		S	U
	2016	CZ	BJ			1	live		T	W
	2016	TZ	ZA			500	scales	g	L	I
	2017	DE	CI			10	scales	g	S	W
	2017	DE	CI		2		scales		S	W
	2018	MY	ZA			1	specimens	ml		C
	2019	DE	CF		450		specimens		S	W
	2014	CA	US	CD		5	specimens		S	W
	2014	CA	US	GH		2	specimens		S	W
	2014	FR	US	CD		5	specimens		S	W
	2014	FR	US	GH		4	specimens		S	W
	2015	FR	US	GH		1	specimens		S	W
	2017	CI	DE	XX	1		specimens		S	W
	2017	FR	US	XX		1	specimens		S	W
	2018	US	FR	XX	1		specimens		S	W
Manis gigantea										
	2014	CN	UG		3198	3211	scales	kg	T	W
	2014	DE	LR		1		scales		S	W
	2014	MY	UG			99	scales	kg	T	W
	2014	US	LR		1		trophies		H	I
	2015	CN	NG		100		live		B	W
	2016	CN	UG		4000	1000	scales	kg	T	W
	2016	CN	UG			3000	skins	kg	T	W
	2016	FR	GA		29		scales		S	W
	2016	HK	BI		6521		scales	kg	T	W

	2016	LA	UG			99	scales	kg	T	W
	2016	TZ	ZA			500	scales	g	L	I
	2017	HK	BI		7705.7		scales	kg	T	W
	2018	CZ	CG		16		specimens		S	W
	2018	MY	ZA			1	specimens	ml		C
	2014	DK	MX	TG		50	skins		T	W
	2014	DK	MX	XX	50		leather products (small)		T	W
	2014	US	MX	TG	66	70	leather products (small)		T	W
	2014	US	TG	XX		200	skins		T	W
	2015	US	MX	TG	58	58	leather products (small)		T	W
	2015	ZA	DK	XX	2		skin pieces		S	W
	2017	US	MX	TG	2		leather products (small)		T	W
	2017	XX	MX	TG		2	leather products (small)		T	W
	2017	XX	MX	TG		2	leather products (small)		T	W
Manis temminckii										
	2014	CN	ZA			2	bodies		E	W
	2014	CN	ZA		1		trophies		E	W
	2014	ZA	NA		15		scales		S	W
	2015	ZA	FR		1		specimens		S	U
	2016	TZ	ZA			500	scales	g	L	I
	2017	CD	ZA		1		live		Z	R
	2018	MY	ZA			1	specimens	ml		C
	2018	TZ	ZA			4	scales		S	W
	2018	ZA	SZ		7		specimens		S	U
	2014	CA	US	TZ		2	specimens		S	W
	2014	CA	US	ZA		1	specimens		S	W
	2014	FR	US	BW		2	specimens		S	W
	2014	FR	US	TZ		1	specimens		S	W
	2014	FR	US	ZA		1	specimens		S	W
	2015	ZA	DK	XX	2		skin pieces		S	W

	2016	SG	GB	XX	1		specimens		P	O
Manis spp. from African range states										
	2014	US	BJ			10	live		T	W
	2014	US	CM		3		meat		P	I
	2015	CN	CD		750		scales	kg	T	W
	2015	US	CM		1		bodies		T	I
	2016	DE	CI			40	scales	g	S	W
	2016	DE	CI		2		specimens		S	W
	2017	US	LR		1		bodies		P	I
	2017	US	NG		2		meat		P	I
	2017	US	TG		8		meat		P	I
	2017	ZA	BW		1		specimens		S	W
	2017	ZA	BW			1	specimens		S	W
	2019	US	UG			1.54	scales	kg	S	W
Manis spp. not from pangolin range states										
	2017	US	FR		2		meat	kg	P	I
	2017	US	MX		4		leather products (small)		P	I
	2018	US	MX		9		leather products (small)		P	I

Annex 6. Standard Operating Procedures for disposing of pangolin specimens

Party	Response
China	The Pangolin Conservation and Research Centre of the National Forestry and Grassland Administration was established in July 2020 by the Chinese government. It is responsible for rescuing injured or confiscated live pangolins. There are also a number of local special agencies for wildlife reception and rescue.
Japan	Disposal of pangolin specimens would take place in cooperation with customs and related organizations, implementing article VIII 4 (b) of the Convention.
Namibia	Namibia stated that SOPs for management and storing of confiscated specimens has been developed but provided no further details. It also noted that it is in the process of developing a SOP for handling live seized pangolins in particular.
Nigeria	There is an operating procedure which resulted to the establishment of seizure committee which comprises of all relevant stakeholders including NGOs (NCF, WCS) etc. with a mandate to monitor and supervise and coordinate the seized specimen from the point of seizures especially handing of the exhibit for forensic investigations and handling of the specimen to NESREA in the presence of all stakeholders and media to be stored in a secure place. Standard operation procedure is carried out before storage on the specimen, it means that fully inventory is carried out which is digitised using secure software. The seized specimen are mark which is in accordance with Nation law and International standard. This inventory was sponsored by Elephant Protection Initiative (EPI).
Singapore	After a container of pangolin specimens is seized at the port, the container is sealed and transported to a secure facility under vehicular escort by law enforcement officers. The National Parks secure facility is equipped with 24-hour surveillance, including closed-circuit television (CCTV) and security personnel. The pangolin specimens are removed from the container for inventory checking, forensics investigation, and sample collection. Once the

	process is completed, the pangolin specimens are sent for incineration. The shipment is securely transported in skid tanks with a vehicular escort by law enforcement officers to an incineration plant. Incinerations are witnessed by at least two witnesses from the CITES Management Authority and incineration plant issues a disposal slip as record of the incineration.
Thailand	Live pangolins are sent to the wildlife rescue centres under the Department of National Parks (National Parks, Wildlife and Plant Conservation Department). Seized scales are stored in a safe place by the Department of National Parks, and any meat or carcasses are destroyed.
United Kingdom	Seizures of live pangolins would be managed in accordance with the Border Force assured standard operating procedures for housing and disposal of all live CITES specimens seized at the United Kingdom Border. Derivatives items, when seized, would be assessed for their potential health risks and be disposed of in accordance with the animal product health regulations in force at the border. The data for all CITES seizures is input into a national Border Force database, and each seizure is allocated a unique reference number. For any seizures made by United Kingdom police, arrangements for housing and disposal/re-homing are made via the CITES Team from Border Force based at Heathrow Airport.
Zimbabwe	Reported that it has SOPs in place but no further information provided.

Annex 7. Disposal of live pangolins

Party	Response
Bangladesh	The procedure in Bangladesh is to release live pangolins into protected areas or place them in publics zoos or safari parks. Among 10 live pangolins seized by the Wildlife Crime Control Unit (WCCU) of the Bangladesh Forest Department between 2012 and 2020, eight were released back into protected areas.
Botswana	Botswana stated seized pangolins are released into protected areas or placed in approved private facilities. It was also stated that it is not possible to evaluate survival rates because animals that are released back into the wild are difficult to monitor.
China	The China CITES Management Authority is in charge of coordination the work of all relevant law enforcement agencies which have roles in combating illegal trade in wildlife, including pangolins. Live pangolins are released into protected areas/placed in designated private facilities.
Côte d'Ivoire	Côte d'Ivoire typically releases live pangolins that have been seized into protected areas. Between 2017 and 2020, seven live pangolins were recovered and released into Banco National Park. All these animals were handed over to authorities by NGOs or citizens
India	Live specimens may be placed in rescue centres / public zoos for treatment before return to the wild. They may also be released into protected or non-protected areas.
Indonesia	Released into protected areas, placed in designated rescue centres or placed in public zoos.
Mozambique	In the period 2016–2020, Mozambique confiscated 79 live pangolins. It disposes of these animals by returning to the country of origin for release into the wild, releases them into protected areas or non-protected areas, or places them in designated rescue centres or other approved private facilities. Pangolins confiscated in the central region of the country are taken to the Gorongosa National Park, which has a pangolin programme and rehabilitates animals. This centre began operating in 2018 and pangolins may also be released into Gorongosa National Park. This does

	mean that pangolins are poached in one area, confiscated while in transit, and then transported to a facility that can provide them with care before being released, potentially into another area still. Mozambique further reported that between 2016 and 2020 it managed 87 dead pangolins, which were either caught in snares, killed for illegal trade, or had to be euthanized.
Namibia	Namibia typically releases live pangolins that are confiscated into protected areas. However, there is no information on how many pangolins survive following their release. Whereas there used to be no monitoring of released pangolins, Namibia started to use tracking devices on seized pangolin to monitor their survival. No information was shared on survival rates.
Singapore	Singapore may return live pangolins to the country of origin for release to the wild, release pangolins into protected areas (if it is a native species – *M. javanica* is the only native species), or as a last resort, euthanise animals if the country of origin does not allow repatriation and the above options are not available. While there have not been any live pangolins confiscated in Singapore, if they were Singapore would follow recommendations in CITES Res Conf 17.8 on the disposal of illegally traded and confiscated specimens of CITES-listed species.
Thailand	Thailand reported that it releases pangolins into protected areas or places individuals in designated rescue centres. Between 2016 and 2020, 1,083 pangolins survived through seizure to release, though no further details were provided (e.g., release site or post-release monitoring).
Zimbabwe	Zimbabwe returns live pangolins that are seized to the country of origin, releases them into protected areas, or places them in designated rescue centres. Between 2016 and 2020, 132 live specimens survived following seizure in the country.

Annex 8. Stockpile recording systems

Party	Response
Bangladesh	The Wildlife Crime Control Unit (WCCU) of the Bangladesh Forest Department maintains a written record and electronic database of seized pangolins (live or dead) and the details of the seizure operation
India	Stocks of pangolin specimens exist in the country due to seizures / confiscations made by various government enforcement agencies in various States. There is no centralized record of such seized pangolin stocks. However, the number of specimens seized / confiscated is recorded in documents such as offence reports and court documents for each case. This information will be available at the State level. Confiscated / seized stocks are stored pending trial by State government agencies and become property of the State government at the conclusion of a case.
Mozambique	Mozambique reported that records are sometimes kept, but not always. Where records are kept they contain information on the date, location (coordinates), details of the individuals who observed the incident (which led to the stockpile), and details of the incident (e.g., seizure), and this information is placed in a database. The information is also shared in annual reports (e.g., of the Administração Nacional da Áreas de Conservação).
Namibia	Every confiscated pangolin is sealed in an exhibit bag and given a unique permit number for identification purposes. Seized items are then stored in a strong storage room for safekeeping. This information is stored in an electronic database.
New Zealand	The CITES Management Authority keeps records of seized specimens retained for the purpose of identification, education, and enforcement purposes.
Nigeria	Stockpile system management (SMS), an electronic data base.
Singapore	When Asian pangolins were transferred from Appendix II to I traders were asked to declare their stocks. Traders who re-exported pangolin

	specimens before the uplisting were subject to inspections of their stock before CITES re-export permits were issued. Regular inventory checks are carried out.
United Kingdom	Seized items are regularly disposed of rather than stockpiled, with meat or carcasses being removed from the port or airport and disposed of within a few days.
Zimbabwe	Has an electronic database for registration and certification of all CITES listed species. It also has a store of seized products which is monitored 24 hours a day all year round with trained personnel using modern security technology to ensure it is secure.

Annex 9. Adequate control measures for stocks

Party	Response
Bangladesh	The Bangladesh Forest Department follows the country's security system to ensure the security of parts and derivatives of pangolins.
Côte d'Ivoire	A secure storage warehouse exists for the products handed over to the management body. However, the management body is unable to control the stocks of other agencies.
India	Stocks of pangolin specimens exist in the country due to seizures / confiscations made by various government enforcement agencies in various States. There is no centralized record of such seized pangolin stocks. However, the number of specimens seized / confiscated is recorded in documents such as offence reports and court documents for each case. This information will be available at the State level. Confiscated / seized stocks are stored pending trial by State government agencies and become property of the State government at the conclusion of a case. Measures to improve the security of stocks may however be contemplated in future if necessary.
Indonesia	In 2018 the Directorate of Biodiversity Conservation, MoEF and the Attorney General's Office together with WCS conducted a field survey regarding the storage of evidence in each the natural resource conservation office (BKSDA) in 9 Provinces of Sumatra and Java. The survey results show that each UPT that has evidence of the results of forestry and environmental crimes has different standards and quality of custody, recording systems, and supervision. Especially for evidence originating from Pangolins, storage facilities, recording, and personnel appointed as responsible, it looks quite adequate and secure.
Namibia	As presented above, confiscated pangolins (deceased) are sealed in an exhibit bag and given a unique permit number for identification purposes. Seized items are then stored in a strong storage room for safekeeping. This information is stored in an electronic database.
New Zealand	Any item retained in stock is catalogued and remains in secure storage on site with the relevant office of the CITES Management Authority.

Nigeria	International best standard operation procedure is carried out before storage of the specimens. This means that a full inventory is carried out which is digitised using secure software. The seized specimens are marked which is in accordance with national law and international standards and well arranged in different sacks with labelling and coding. This inventory was sponsored by Elephant Protection Initiative (EPI).
Singapore	There is no government-held stockpile of pangolin products in Singapore, though they have designated secure storage facilities for daily operations.
United Kingdom	Derivatives seized at the border are not stored indefinitely and can be disposed of after 30 days. Meat or carcasses will be disposed of almost immediately unless there is a requirement for species identification as part of an ongoing investigation – though this would have to involve "commercial quantities" of pangolins. Parts or derivatives seized by the police remain in the care and control of police forces pending court proceedings or their destruction or disposal to recognised establishments for educational or scientific use.
Zimbabwe	As presented above, Zimbabwe has a database for registration and certification of all CITES listed species. It also has a store for seized products which is monitored 24 hours a day all year round.

Annex 10. Law enforcement challenges

Party	Response
Bangladesh	Wildlife Crime Control Unit (WCCU) of Bangladesh Forest Department is directly working to combat illegal wildlife poaching, trafficking and trade and to ensure enforcing punishment which is directed in the Bangladesh Wildlife (Conservation and Security) Act, 2012 as well as to raise public awareness for conserving wildlife. However, sometimes the field officers of WCCU faces some challenges during confiscated pangolin.
Botswana	Limited resources to undertake effective law enforcement operations over expansive wildness area to curb illicit trade in pangolin species.
Côte d'Ivoire	Absence de budget pour organiser la sensibilisation à la prévention du braconnage, du commerce illégal et d'autres activités illégales concernant les pangolins.
India	Both species of pangolin which occur in India are fully protected under the Wild Life (Protection) Act, 1972. This effectively prohibits all trade in their parts and derivatives and legal trade in specimens is limited to trade of live animals between recognized zoos. Possession of pangolin parts and derivatives is also heavily regulated. Certain enforcement challenges remain though due to lack of capacity and manpower in certain States.
Indonesia	Indonesia is yet to have a map of rescue centre as the location for confiscated evidence, as well as an SOP on evidence management, including protocol for forensic sample, guideline for temporary husbandry, release and evidence handling, and data management of evidence. This becomes a challenge in the field when dealing with pangolin illegal trade cases.
Mozambique	There are two positions resulting from the new progressive conservation law and the challenges with its implementation, which were not yet concealed: "Since the emergence of the Biodiversity Conservation Act in 2014 and updated through the Law on The Protection, Conservation and Sustainable Use of Biological Diversity in 2017, state inspectors (Provincial Environment Service) have never been subjected to a specific

	training/training on how to deal in a practical way with the species, equipment or means used for its capture and conservation and details of their contribution to the ecosystem to better advise the Public Ministry in the face of a judicial or criminal process of pangolin." By Provincial Government "… Many of the poachers we arrest are not given the full sentence as advised by law. The local prosecutors being unwilling to push for a conviction and the judges being lenient, especially if we catch them before they have killed something. With the change in the law, poachers arrested for more serious violations such as pangolin and ivory poaching can now only be tried in the larger courts and not the local courts. This means that we have to send a scout to testify to [..], this can mean the scout is off work for the hearing for 3 days including his travel time. All at [our] expense. Of all the cases sent to [..] court, [we] has sent a scout every time and not once has the offender showed up, so every trip was wasted, time, money and time out of the field for the scout." By private operators of public or private protected areas Law enforcement also faces neglect and issues around poaching are not valued enough, because ordinary citizens and decision-makers lack knowledge about conservation. Also judicial procedures are failing in that despite an excellent conservation law, arrestees are routinely released on bail with no consequences.
Namibia	Inadequate of human and capital resources
Nigeria	Inadequate logistics, Lack of stringent punishment, Illiteracy (inadequate knowledge of wildlife and wildlife crime, poverty, lack of alternative means of livelihood, Numerous/porous border, weak enforcement due to finance, capacity building for frontlines offices, inadequate awareness sensitization etc.
Singapore	Singapore is neither the source nor the destination for illegal pangolin shipments. In this context, it would be more effective to intensify enforcement efforts a) upstream in the source countries to tackle pangolin poaching and prohibit the illegal export of pangolins, and b) downstream in destination countries to eradicate consumer demand for pangolin

products and to take legal action against the actual importers of illegal pangolin. In addition, when information of seizures is sent to source countries for investigations, we do not hear back from them on the outcomes of their investigations.

Annex 11. Technical law enforcement challenges

Party	Response
Bangladesh	Bangladesh Forest Department faces some technical resource-related enforcement challenges like sufficient data on pangolin population status, monitoring support equipment etc.
Botswana	Shortage of vehicles, camping equipment and specialized essential operational equipment to undertake effective patrols and operations to curb pangolin illegal trade.
Côte d'Ivoire	Insuffisance de formation et d'équipement des agents de terrain.
India	Certain States may have a shortfall in equipment such as vehicles for patrolling. Forensic capacity in terms of labs able to identify pangolin species from scales can be improved.
Mozambique	The challenges are: not enough vehicles and funds for fuel and deployment of more scouts; not enough resources to cover costs to feed and transport poachers to a police station; the same vehicle that is used for all operations has also to transport the poacher to the local police station which is a cost and risk as local communities can get aggressive over seeing a member going to jail. Scouts are not allowed to carry firearms in Mozambique which reduces their ability to face. Released Pangolins could be equipped with GPS tracking devices to better improve surveillance and also better understand occurrences
Namibia	Inadequate equipment at port of entry and port of exit to detect trafficking of pangolin specimens.
Nigeria	Inadequate logistics, review of obsolete state laws, community involvement in wildlife and wildlife crime, lack of equipment (scanners at the spot of scene)
Thailand	Thailand lack of modern equipment to inspect objects in some cross-border areas.

Annex 12. Human resource law enforcement challenges

Party	Response
Bangladesh	Lack of manpower in Bangladesh Forest Department to preventing poaching, illegal trade and other illegal activities concerning pangolins. Insufficient budget to meet enforcement challenges.
Botswana	A large proportion of the country remain remote and wild with challenging terrain which requires a large pool of human resource to cover the expansive area for effective domination of the area. As a result, a much larger human resource base is required to cover the entire country effectively and efficiently.
Côte d'Ivoire	Insuffisance du personnel et de compétence.
India	Certain States may have a shortfall in terms of well-trained enforcement personnel.
Indonesia	The human resources with sufficient skills and numbers are not available to properly handle and care for the confiscated pangolins so that they can survive outside their habitat. The DG of Law Enforcement MoEF has published 4 manuals (guidance book) on wildlife handling for groups: Aves, Mammal, Reptile and Primate, this book was created as a guide for officers in the field (forest rangers) when capturing live animals resulting from law enforcement. To facilitate it, video tutorials are currently being made for several types of animals that are often obtained from the results of law enforcement. Animal Handling Training was held in 2019 for upgrading forest ranger capacity which was attended by 66 forest rangers of the Ministry of Environment and Forestry.
Mozambique	Due to COVID the number of scouts has had to be reduced due to financial constraints and in other areas some emergency funds help to cover some months and are not sufficient to lookout for the next months. But even in a normal year there are not enough well trained anti-poaching teams available. Also many are not sufficiently trained in legal matters. Most of the operational costs go into anti-poaching which

	makes it hard to improve on other conservation tasks. Professionally trained and equipped IWT teams need to be expanded.
Nigeria	There is need to provide alternative livelihood for the local dwellers and empowering local hunters and bush meets sellers on other forms of vacation this will reduce hunting and selling of pangolin and other wildlife derivative.
Thailand	Lacking officers for patrolling along border.
United Kingdom	As the prevention of Illegal Wildlife Trade is only one of many priorities for enforcement at the UK Borders and is not deemed a top priority, there are very limited resources focused specifically on this threat. There is a significant and ongoing need to upskill other generalist Border Force officers to ensure they are aware of the IWT threat and how it may manifest itself in the traffic which uses their specific port.

Annex 13. Budget-related law enforcement challenges

Party	Response
Bangladesh	Insufficient budget to meet enforcement challenges.
Botswana	Limited budget inadequate to undertake effective law enforcement as well as research study on pangolin species in the country, especially on its population distribution.
Côte d'Ivoire	Inexistence de budget destiné à la lutte contre la fraude liée au pangolin
India	Certain States may have a shortfall in terms of their budgetary layout for enforcement.
Indonesia	Funding is one of the challenges for the implementation of law enforcement activities in the field. Mapping of sources and allocation of funding as well as preparation of budget plans for law enforcement using the compilation method of funding sources, is being pursued by the Government of Indonesia to overcome the existing challenges. In general, the budget for wildlife law enforcement in the Ministry of Environment and Forestry is limited and do not purposes only for specific species.
Mozambique	Private operators are struggling a lot because of the restrictions in the tourism sector world-wide in light of the ongoing pandemic. Operations depend on profit made from Safari clients. A few protected areas have received assistance through emergency funds to pay for scouts, food, and fuel to maintain the bare minimum of anti-poaching. Anti-poaching is an activity that cannot be allowed to stop at any day. There is no room for other conversation work. A budget dedicated to anti-poaching support by the government would be good. Budgets cover only for a percentage of the amount needed to achieve solid operations.
Namibia	Financial constrains is one of the factors affecting efforts to prevent illegal trade and other illegal activities of wildlife in the country which includes pangolin.
Nigeria	Inadequate logistics, Lack of stringent punishment, Illiteracy (inadequate knowledge of wildlife and wildlife crime, poverty, lack of alternative means of livelihood, Numerous/porous border, weak enforcement due to

	finance, capacity building for frontlines offices, inadequate awareness sensitization etc.
Thailand	We have limitation of budgets and vehicles.
United Kingdom	As above, budgets are allocated based on priority and IWT is not a top priority for UK BF. This therefore limits the funding applied specifically to IWT detection and prevention, instead UK BF relies on the work of generalist Border Force officers covering a wide range of threats across the many ports that make up the UK Border to provide referrals to the specialist national CITES team of 10 officers based at Heathrow Airport, although only 6 are operational with a UK wide remit.

Annex 14. Law enforcement best practices

Party	Response
Botswana	Inter-agency cooperation and collaboration, and good intelligence networking within local communities co-existing with Pangolins
China	After receiving intelligence from the General Customs Administration of China, Singapore seized 12.9 tons of pangolin scales. In 2019, competent authorities from Singapore and China established an inter-agency team and worked together to combat illegal trade in wildlife. In the context of their collaboration, they have shared intelligence information and carried out joint operations that led to significant seizures of illegally traded wildlife and to the arrest of criminal networks. Their collaboration, including exchange of information and joint operations, has been effective particularly in the seizure of pangolin scales (such as a shipment of 12.9 tons pangolin scales declared as frozen beef and on its way from Nigeria to Viet Nam) and in dismantling and bringing to justice Asian criminal networks of illegal trade in wildlife.
Côte d'Ivoire	Certaines pratiques sont exemplaires : mission conjointe de saisies avec les structures telle que l'Unité de lutte contre la Criminalité Transfrontalière Organisée (UCT) ; incinération de 3 tonnes d'écailles de pangolin le 3 mars 2020; contrôle au niveau des postes frontaliers et aéroportuaires.
The Gambia	We do anti-poaching technique through standard operation procedure in terms of pangolins no hence CITES personnel are not at the borders to investigate or search of any illegal operations related to movement of illegal CITES specimens in and out.
India	Apart from implementation of CITES, India's Wild Life (Protection) Act, 1972, also prohibits domestic trade, and strictly regulates possession of *Manis crassicaudata* and *Manis pentadactyla* parts and derivatives. India's Wildlife Crime Control Bureau (WCCB) shares intelligence and information about pangolin poaching and trade with enforcement agencies and maintains a crime databank and profiles of pangolin poachers. Pangolins occur in several protected areas and tiger reserves in India and preventative patrolling of these areas provides protection to them.

Indonesia	One of the best practices to process and strengthen law enforcement against the illegal pangolin trade in Indonesia is to use a multi-door approach. The multi-door approach is carried out by involving various law enforcement agencies and using various laws to create a deterrent effect on criminals. This approach is very effective for use against crimes with the nature of extra-ordinary and trans-national crimes, such as the illegal trade in animals. Through a multi-door approach, it is possible to enact broader legal sanctions, such as freezing funds and impoverishing actors through mechanisms in the financial sector. In the last three years we have carried out patrols in several conservation areas, such as the Gunung Leuser National Park, BBKSDA Riau, BKSDA Aceh, Bukit Tiga Puluh National Park and Bogani Nani wartabone National Park. This activity is a form of efforts to prevent illegal wildlife trade.
Mozambique	They are only implemented inside protected areas, which is not enough. Rangers are educated to understand the value of wildlife and do good work. Joint anti-poaching operations with units of various protected areas have worked well. The use of technologies such as SMART has also helped to map hotspots and improve quality of efforts.
Namibia	Random roadblock operations are usually set up, targeting illegal movements of wildlife products which includes pangolins.
Nigeria	Intelligence sharing among relevant agencies; Stockpile Management System (SMS); Central Platform for notifications and alerts; joint task force on combating illegal wildlife trade, inter-agency collaboration etc
Singapore	Singapore adopts a whole-of-government comprehensive range of measures. We have a robust domestic framework that combines strong enforcement efforts, tough laws and heavy penalties. We adopt an action-oriented approach to intelligence reports and employ a comprehensive risk assessment framework to carry out strict inspections of travellers and cargo. We take proactive steps to raise public awareness on this issue, and to continuously train and upskill our enforcement officers. We cooperate with international partners in sharing information, enforcement operations, and tracing poaching hotspots at source countries.
Thailand	Collaboration between departments and data / detection tools was shared.

Annex 15. Domestic operations to combat pangolin poaching and trafficking

Party	Response
Bangladesh	Bangladesh Wildlife (Conservation and Security) Act, 2012 had come into force with the provision of higher punishment for stopping or banning the poaching, illegal trading etc. of wild animals including pangolin. According to this act, Chinese pangolin (Manis pentadactyla), Indian pangolin (Manis crassicaudata) and Malayan Pangolin (Manis javanica) are protected animal under Schedule-1. Besides this, a person can be given imprisonment of one to three years and while fines can range from Tk 50,000 to Tk 2 lakh for killing a protected wild animal, or collecting, preserving, buying and selling, or transporting its meat, or any parts according to this act.
Botswana	A number of law enforcement *fora* involving all law enforcement agencies have been established country wide that conducts both scheduled and ad hoc operations.
China	Every year, a series of law enforcement actions are organized to combat the illegal trade in wildlife, including pangolins. For example, a joint multisectoral law enforcement operation code-named QINGFENG is now under way.
India	The WCCB launched the LESKNOW series of operations (LESKNOW, LESKNOW-II & LESKNOW-III) to draw the attention and focus of enforcement agencies towards poaching and illegal trade of lesser-known species of wildlife including pangolins. Multiple agencies participated and several enforcement actions resulted from these operations. Operation LESKNOW resulted in two pangolin seizures, one from West Bengal (980 grams pangolin Scales) and another from Uttrakhand (2100 number of pangolin Scales). Operation LESKNOW-III resulted in three pangolin seizures, one from West Bengal (two live pangolins), one from Uttrakhand (one live Pangolin) and one from Maharashtra (three kilograms of pangolin scales). A total of 15 offenders were arrested during the LESKNOW operations besides recovery of 3.98 kilograms and 2100 pangolin scales, and 3 live pangolins. Sensitization, awareness and capacity building programmes were also undertaken during the LESKNOW operations.

Indonesia	Indonesia's law enforcers have succeeded in uncovering and thwarting the smuggling of pangolin both on a large and small scale, either through water routes but also by land and air routes. The biggest operation occurred in 2015 when Indonesian law enforcement officers confiscated 5 tonnes of packed dead pangolins (frozen meat), 77 kg of scales, and 96 individual pangolins in a live state in a warehouse in North Sumatra. Lessons learned is the need for a good multi-stakeholder system of coordination, cooperation and communication between law enforcers. Apart from that, the understanding and awareness of law enforcers and competent authorities regarding pangolin rescue also need to be improved.
Japan	Domestic trade of pangolins in Japan is basically prohibited by the Act on Conservation of Endangered Species of Wild Fauna and Flora in line with CITES. Permission or registration is required upon domestic trade.
Mozambique	Gorongosa launched ANAC's Central Mozambique IWT Unit that focuses on trafficking on timber, pangolin, elephant and lion/leopard.
Nigeria	Domestication of Endangered Species (Control of International Trade and Trafficking) in Fauna and Flora Amendment ESA Act 2016.
Singapore	There were three major domestic law enforcement operations in 2019 involving illegal container shipments of pangolin scales transiting through Singapore. All three cases involved over or close to 12,000 kg of pangolin scales declared as transhipment, with intended Port of Discharge at Vietnam, Haiphong, with Ports of Loading at Nigeria and the Democratic Republic of Congo. Pangolin scales were bagged and hidden among other goods, i.e., packets of frozen meat, bags of cassia seeds, and sawn timber pieces. Two of the three cases involved illegal elephant ivory in the same shipments. Singapore established a Mutual Legal Assistance agreement with China Customs and the information exchanged led to their arrest of 14 individuals in China who were involved.
Thailand	Thailand has enacted the Wildlife Preservation and Protection Act, B.E. 2562 (2019).

Annex 16. International cooperation to combat pangolin poaching and trafficking

Party	Response
Bangladesh	On behalf of Bangladesh Forest Department, Wildlife Crime Control Unit (WCCU) is collaborating with South Asia Wildlife Enforcement Network (SAWEN) to combat the poaching and illegal trade of wildlife, including pangolin.
Botswana	Operation Thunder ball and Cobra
Côte d'Ivoire	L'opération THUNDER 2020 était axée sur la lutte contre le trafic illégal des espèces sauvages menacées. Au cours de cette opération, le pays a enregistré une seule saisie de pangolin vivant des mains d'un trafiquant. Le spécimen a été relâché dans son milieu naturel.
India	The THUNDER Series Operations (e.g. THUNDERBIRD, THUNDERSTORM, THUNDERBALL & THUNDER 2020) were launched by INTERPOL to draw the attention and focus of enforcement agencies of Parties on poaching and illegal trade of wildlife species including pangolins. India participated in these operations. The Outcome of the THUNDER Series Operations was very encouraging. Operation THUNDERSTORM resulted in three pangolin seizures, from Karnataka (one live pangolin & one kilogram pangolin Scales), Haryana (one live pangolin) and Kerala (1.6 kilograms pangolin scales). A total of 14 offenders were arrested during the operation. Operation THUNDERBALL resulted in three pangolin seizures, from Maharashtra (one live pangolin), Assam (one live pangolin), and Madhya Pradesh (one live pangolin). A total of 5 offenders were arrested during the operation. Operation THUNDER 2020 resulted in ten pangolin seizures, first from Assam (one live Pangolin), second from Assam (5.725 kilograms pangolin scales), third from Gujarat (two pangolin carcasses & 9 kilograms pangolin scales), fourth from Maharashtra (9 kilograms pangolin scales), fifth from Maharashtra (3 kilograms pangolin scales), seventh from Kerala (2 kilograms pangolin scales), eighth from Madhya Pradesh (2.3 kilograms pangolin scales), ninth from Jharkhand (one live pangolin), and tenth from Chhattisgarh (one live pangolin). A total of 37 offenders were arrested during the operation.

	In total, the THUNDER Series Operations resulted in 16 pangolin seizures involving 8 live pangolins, two pangolin carcasses & 33.625 kilograms of pangolin scales, and the arrest of 56 offenders.
Indonesia	The Indonesia's Rapid Reaction Police Unit (SPORC) collaborates with INTERPOL in the field of wild plants and animals. This collaboration succeeded in uncovering several pangolin trading cases due to information of smuggling networks and routes supplied by INTERPOL which was then followed up by SPORC.
Mozambique	The operations are organized by ANAC' intelligence unit which is separate to the protected areas individual anti-poaching units. ANAC's Central Mozambique IWT Unit routinely communicates with NGOs/agencies operating along adjacent border areas.
New Zealand	New Zealand regularly participates in the INTERPOL and World Customs Organisation "THUNDER" series of operations targeting wildlife crime.
Nigeria	MOU between Cameroon and Nigeria on combating illegal wildlife trade West African strategy in combating illegal wildlife Trade ICCWC being developed by UNODC Operation Thunderbolt with INTERPOL.
Singapore	Since 2015, Singapore has actively participated in international wildlife operations targeting the illegal wildlife trade across borders. For example, Singapore participated in the INTERPOL-led Operation PAWS II in 2015, which is a regional wildlife enforcement operation targeting the illegal wildlife trade in Asia. In 2020, Singapore participated in the INTERPOL Thunderball Operation, which made 2,082 seizures of wildlife and forestry products. In the same year, Singapore also participated in the UNODC-led Operation Mekong Dragon II, which resulted in the detection of 284 cases involving the trafficking of drugs and wildlife products.
Thailand	1. Department of National Parks, Wildlife and Plant Conservation assigned the Office of Conservation Area Management 15 (Chiang Rai) and the Wildlife and Plant Conservation Division in accordance with the Convention. (Wildlife Trafficking in the Golden Triangle), in cooperation with the World Wildlife Fund (WWF), is implementing a project to combat wildlife trafficking in the Golden Triangle. WWF-Mekong Region Work

	with WWF-Thailand, WWF-Myanmar WWF-Laos and the Wildlife and Plant Surveillance Network (TRAFFIC) with the aim of establishing inter-agency law enforcement cooperation. Along with increasing the capacity of law enforcement officials to prosecute cases in connection with illegal wildlife trafficking. This will lead to a significant reduction in wildlife trafficking in the area. 2. Department of National Parks, Wildlife and Plant Conservation, United Nations Development Program (UNDP), an international organization, It received financial assistance from the Global Environment Facility (GEF) for the implementation of the Combating Illegal Wildlife Trade, focusing on Ivory, Rhino Horn, Tiger and Pangolin in Thailand project.
United Kingdom	Border Force has contributed to numerous international IWT operations including Cobra II, Cobra III, Thunderball, Thunderstorm and Thunder 2020 although not specifically aimed at pangolins.

Annex 17. Tools and materials to support implementation of Res. Conf. 17.10

Party	Response
Bangladesh	Bangladesh Wildlife (Conservation and Security) Act, 2012 had come into force with the provision of higher punishment for stopping or banning the poaching, illegal trading etc. of wild animals including pangolin. Strengthened national inter-agency cooperation, especially law-enforcing agency and international cooperation to combat illegal wildlife poaching, trafficking and trade. Educational outreach programs have been conducted focusing on ecological importance of this species, raising awareness against illegal trade etc. Capacity-building activities have been conducted throughout the country, with a particular focus on safe handling, care and rehabilitation, and release back into the nature of live seized pangolins.
China	Pangolins have been transferred from national second-class protection to national first-class protection, which are strictly protected and utilized orderly according to the Wildlife Conservation Law of the People's Republic of China.
Nigeria	The Pangolin Conservation Guild Nigeria is an NGO that has established pangolin conservation and research centre at the University of Ibadan where rescued pangolins are nursed, rehabilitated and released into protected forest areas. This centre has conservationists, scientists and veterinary personnel. Any confiscated live pangolin can be sent to this centre for proper care and conservation before it released.
Singapore	The National Parks Board launched the Centre for Wildlife Forensics in August 2020 to strengthen its detection and diagnostic capabilities to identify and analyse specimens involved in the illegal wildlife trade. In addition to morphological and histochemical analyses of seized items, the Centre can utilise other molecular tools—e.g., DNA analysis methods such as next generation sequencing, and chemical methods such as mass spectrometry and isotope analysis—to provide greater resolution and deeper insights on the seized items, such as the origin of the population of species that have been poached. Such information can help international organisations and source countries to undertake further investigation and targeted enforcement action at poaching hotspots. These capabilities will also enable the analysis of seizures

	throughout the globe to identify potential linkages and syndicates through collaborations with international experts and organisations.
Thailand	Thailand has revised its wildlife protection campaign to the Wildlife Preservation and Protection Act of 2562 (2019).
United Kingdom	A team at the University of Portsmouth has developed a technique for lifting fingermarks from the scales of pangolins, demonstrating the potential to connect criminals to illegally traded pangolins via fingerprints. See the paper published in Forensic Science International (link here).

Annex 18. Dismantling organised crime groups

Party	Response
China	China reported that Forest police in Hunan province have broken up a nationwide illegal trade network that transported pangolins from Guangxi province to Guangzhou in 2018. 129 criminal suspects were detained and 25 arrested, and 32 suspects have been pursued online. 216 *Manis javanica* individuals, 66 kg of scales, and other wild animals and their products were confiscated. More than CNY 18 million of illicit gains was seized.
India	One of the largest recoveries of pangolin scales was conducted by the Maharashtra Police in 2014, where 43 kilograms of pangolin scales were recovered from one person. Another connected case in the neighbouring State of Madhya Pradesh resulted in the arrest of 5 persons and seizure of 2 kilograms of pangolin cases. The subsequent investigation of these cases led to further cases being registered, further arrests and seizures being made, and the uncovering of an organized cross-border criminal network involved in pangolin poaching and trafficking. The enforcement work in these cases was carried out through the joint efforts and cooperation of the State Tiger Strike Force of Madhya Pradesh, the Odisha Police, the Odisha Forest Department, and the WCCB. The investigation utilized modern techniques, identified bank accounts being used for illegal pangolin trafficking, and identified Myanmar based buyers for the contraband. A total of 38 persons were arrested in connection with the above cases besides the seizure of quantities of pangolin scales.
Indonesia	The identified pangolin trading network is spread across Sumatra1, Java and Kalimantan. The existence of this network was confirmed by several cases of arrests of pangolin trading syndicates in these areas. In Sumatra, 2 areas are used as a way out for transporting pangolins to Malaysia, which are Medan in North Sumatra and Riau. The detected network uses sea lanes to transport pangolins, using either containers4 or small vessels (wooden ships and fast boats).
Singapore	In 2019, Singapore received a tip from Fuzhou Customs and Xiamen Customs of China regarding an illicit shipment of pangolin scales travelling from Nigeria to Vietnam, which was due to transit through Singapore. Based on this

information, in April 2019, Singapore stopped two large shipments (25.6 tonnes) of pangolin scales. Following the seizure, Singapore shared information with China through mutual legal assistance channels. Subsequently, in July 2019, Singapore seized another container containing 11.9 tonnes of pangolin scales and 8.8 tonnes of elephant ivory, based on intelligence provided by Nanning Customs of China. Once again, through mutual legal assistance, information prepared by Singapore was handed over to the Chinese authorities. In both instances, this bilateral information exchange helped China to pursue its investigations, leading to arrests of suspects of Chinese nationality based in Africa and Vietnam. The efforts by the Singapore and Chinese authorities were also recognised by the UN Asia Environmental Enforcement Awards 2019 for the significant contribution to combat wildlife crime.

Annex 19. New methods used by organised crime groups

Party	Response
India	The major threat to pangolins in India is poaching for international trade as its meat and scales are in demand in East and South Asian countries. There is now greater evidence of this illegal international trade, in particular in scales, from India to Myanmar and other South East Asian countries as most likely final destinations. Pangolins are generally poached by members of traditional nomadic hunting groups who live in temporary shelters either at the periphery of wildlife rich areas or at nearby towns and railway stations. They are sometimes engaged by farmers, especially in the States of Madhya Pradesh, Uttar Pradesh and Rajasthan, to protect crops from wild animals and may opportunistically hunt pangolins at night. They have traditional knowledge and skills in detecting pangolin burrows. The meat of the animal may be consumed or sold locally, and the scales are stored for selling to middlemen in the illegal trade. Once significant quantities of scales are gathered, they are sold to middlemen with links to illegal traders based in cities. From collection centres, they are transported to the international border mainly in trains by human carriers, often women. They prefer night trains which reach the destinations in early mornings. However, there are instances when pangolin scales have also been transported by postal parcels or courier service and by air. Postal parcels are usually sent with fake names and addresses of consigners and consignees. In such cases, deliveries are taken personally from the destination post offices. Pangolins are being hunted in all pangolin range States in India. The demand for pangolins and their parts and derivatives comes mainly from East and South-East Asian countries and smuggling is generally transited through Nepal, Bhutan and Myanmar. Delhi, Chennai, Kolkata, Behrampur, Siliguri, Imphal and Dimapur are reported as main transit centres within the country. From Delhi, Chennai and Kolkata, pangolin scales are transported mostly by railways and postal or courier parcels to towns near the Indo - Nepal, Indo - Bhutan and Indo - Myanmar borders. Though the entire porous international border with Nepal, Bhutan and Myanmar are prone to smuggling, Darchula, Gorakhpur, Raxaul, Motihari, Siliguri, Dimapur, Champhai (Mizoram), Imphal and Moreh (Manipur) are important towns through

	which wildlife articles are routed before smuggling across national borders. There have been instances when pangolin scales were transported by air from Chennai to Delhi and from Delhi & Guwahati to Imphal. In recent times, Siliguri has become a highly sensitive transit centre or route for wildlife smuggling and traffickers from Northern and Central India are transporting wildlife articles, including pangolin scales, directly to Siliguri. From Siliguri, contraband may be taken to Nepal through Panitanki or transported closer to the Bhutan and Myanmar borders. From Dimapur and Imphal, smuggling takes place to Myanmar through Moreh in Manipur. However, due to increased enforcement activities in Manipur, wildlife articles are increasingly being routed through Mizoram to Myanmar.
Indonesia	The payment method for sending pangolins in Riau uses a foreign currency deposit (Ringgit) at the money changer, then from the money changer, it is transferred into Rupiah (Indonesian currency) to the account used by the perpetrator in Riau.

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