



**Implementación de las decisiones CITES
17.239 b) y 17.240 sobre Pangolines (*Manis
spp.*)**

Preparado por IUCN por la Secretaría CITES

Dan Challender y Carly Waterman

Septiembre de 2017

Acknowledgments

This report was made possible with financial support from the CITES Secretariat.

The authors would like to thank Pia Jonsson, Tom De Meulenaer, Ben Janse van Rensburg and Sofie Flensburg in the CITES Secretariat for reviewing earlier versions of this report. Richard Jenkins from IUCN's Global Species Programme is also thanked for his helpful review of the report. The CITES Parties are thanked for completing the questionnaires that informed this report and for reviewing a draft to ensure it is as accurate and up to date as possible. Willow Outhwaite from TRAFFIC is thanked for advising on the use of TradeMapper.

Author affiliations

Dan Challender, IUCN Global Species Programme, The David Attenborough Building, Pembroke Street, Cambridge, CB2 3QZ, United Kingdom

Carly Waterman, Zoological Society of London, Regent's Park, London, NW1 4RY, United Kingdom

Table of Contents

Executive summary	1
1. Introduction	8
2. Methodology	9
3. Introduction to pangolins	11
4. The listing of pangolins in the CITES Appendices	12
5. National and global conservation status	13
5.1 Status of Asian pangolins	13
5.1.1 Information from other sources	15
5.1.1.1 <i>Manis pentadactyla</i>	15
5.1.1.2 <i>Manis javanica</i>	18
5.1.1.3 <i>Manis crassicaudata</i>	21
5.1.1.4 <i>Manis culionensis</i>	24
5.2 Status of African pangolins	25
5.2.1 Information from other sources	26
5.2.1.1 <i>Manis tricuspis</i>	27
5.2.1.2 <i>Manis tetradactyla</i>	29
5.2.1.3 <i>Manis gigantea</i>	30
5.2.1.4 <i>Manis temminckii</i>	32
6. Legal and illegal trade in pangolins	34
6.1 Legal trade	34
6.1.1 Asian pangolins	34
6.1.2 African pangolins	39
6.1.3 Legal trade not reported to CITES	44
6.2 Illegal trade	44
6.2.1 Live/dead pangolins	47
6.2.2 Scales	50
6.2.3 Meat	54
6.2.4 Medicine	55
6.2.5 Other	55
6.2.6 Information from other sources	56
7. Legislation and enforcement	57
7.1 Legislation regulating international trade in pangolins	57
7.2 Regulation of harvesting and use of pangolins	58
7.3 Minimum and maximum penalties for illegal activities	58

7.4 Forensic analysis of pangolin specimens	65
7.5 Forensic analyses conducted on pangolin specimens	65
7.6 Regulations for managing, storing, and disposing of confiscated pangolins	66
7.7 Enforcement challenges in combatting illegal trade in pangolins	68
7.8 Enforcement best practices in combating illegal trade in pangolins	68
7.9 Collaboration and international operations	69
8. Stockpiles and stockpile management	70
9. Identification and capacity building	72
10. Current captive pangolin populations	73
10.1 Information from Other Sources	73
11. Demand management, education and awareness-raising	75
11.1 Demand management	75
11.2 Education	76
11.3 Awareness-raising	76
11.3.1 Information from other sources	77
12. Ongoing and needed conservation actions	79
12.1 Conservation Planning	79
12.2 Monitoring methods	80
12.3 Trade monitoring	80
12.4 Site-based protection and local community engagement	81
12.5 Captive Management	82
13. References	83
Annex 1 Methods used to estimate number of pangolins in trade	95
Annex 2 Legislation tables	97

Resumen ejecutivo

En la 17ª reunión de la Conferencia de las Partes en la CITES (CoP17, Johannesburgo, 2016), las 8 especies de pangolín se transfirieron del Apéndice II al Apéndice I de la CITES. Las Partes aprobaron también la Resolución Conf. 17.10 sobre *Conservación y comercio de pangolines*, y las Decisiones 17.239 y 17.240 sobre Pangolines (*Manis* spp.). En la Decisión 17.239 se encarga a la Secretaría CITES, entre otras cosas, preparar en cooperación con organizaciones pertinentes y en consulta con los Estados del área de distribución y los Estados implicados, un informe sobre: (i) la situación a nivel nacional y mundial de la conservación de las especies africanas y asiáticas de pangolines; (ii) la información disponible sobre los niveles de comercio legal e ilegal; (iii) la información pertinente sobre las medidas tomadas para la aplicación de la ley; (iv) las existencias de especímenes y derivados de pangolines; (v) los inventarios de las poblaciones de pangolín actualmente cautivas; y (vi) los nuevos avances acerca de las medidas sobre la gestión de la demanda, la educación y la sensibilización en relación con los pangolines.

La Secretaría CITES contrató a la Unión Internacional para la Conservación de la Naturaleza (UICN) para que preparase el precitado informe, y la UICN elaboró un cuestionario para facilitar la compilación de datos de las Partes. La Secretaría CITES transmitió el cuestionario a las Partes como un Anexo a la Notificación a las Partes No. 2017/035. La UICN recibió respuestas a esa Notificación de 37 Partes, incluyendo Estados del área de distribución del pangolín de África y Asia y Estados que no eran parte del área de distribución. A fin de aportar mayor información a este informe, se examinaron las respuestas de las Partes al cuestionario preparado por el Grupo de trabajo sobre los pangolines del Comité Permanente de la CITES en 2015 (Notificación a las Partes No. 2014/059) para garantizar que este informe fuese lo más exhaustivo posible. Así, pues, se incluyeron las respuestas de otras 23 Partes y, por ende, el presente informe se basa en la información sometida por 61 Partes. Adicionalmente, se llevó a cabo un examen de la literatura científica pertinente, se analizaron los datos sobre el comercio CITES y un análisis del comercio ilegal basado en los datos sometidos por las Partes y los datos adicionales proporcionados por la ONUDD. Asimismo, a fin de completar este informe se solicitó a organizaciones internacionales de conservación que aportasen información sobre la situación de los pangolines y los esfuerzos para reducir la demanda y fomentar la sensibilización, así como sobre la educación.

Situación a nivel nacional y mundial de la conservación

La mayor parte de los Estados del área de distribución que proporcionaron información sobre la situación de conservación de los pangolines señalaron que había datos insuficientes sobre las poblaciones o que éstas estaban disminuyendo, y sigue existiendo escasa información cuantitativa sobre la situación de los pangolines a nivel local, nacional e internacional. Sólo Brunei Darussalam comunicó que su población estaba aumentando. Sin embargo, los elevados niveles de extracción directa, las investigaciones sobre el comercio y el tráfico de pangolines, y los cambios en las tendencias del comercio, corroboran la afirmación de que las poblaciones están disminuyendo. Cada especie de pangolín está amenazada de extinción según la Lista Roja de Especies Amenazadas de la UICN™, siendo categorizadas como En peligro crítico, En peligro o Vulnerable, basándose en las disminuciones de la población pasadas, en curso y futuras atribuidas a la caza furtiva y a la caza para el tráfico internacional de vida silvestre y uso nacional. Como ejemplo, de la investigación se desprende que las poblaciones de *Manis pentadactyla* han disminuido hasta un 94% en China y sus regiones fronterizas.

Comercio legal e ilegal

El comercio internacional de pangolines comunicado a la CITES concierne principalmente a las especies asiáticas. En su mayor parte se trataba del comercio de pieles, con aproximadamente 500.000 pieles comercializadas entre 1977 y 2014. Asimismo, se trataba de escamas (el equivalente a aproximadamente 50.000 pangolines), la mayoría de las cuales representaba el comercio de *M. javanica*. Prácticamente todo este comercio se realizó antes o durante el año 2000, fecha en que se establecieron cupos de exportación nulos para los pangolines asiáticos, y se ha declarado comparativamente poco comercio desde esa fecha. Sin embargo, entrañó la exportación de 1.000 pieles de *M. pentadactyla* de la República Democrática Popular Lao (Lao PDR) en 2010, que se declararon como criadas en granjas (código de origen 'R'). Este código de origen parece discutible debido a las sabidas dificultades para criar y mantener pangolines en cautividad, y determinar que este número de animales en el medio silvestre tendría escasas probabilidades de sobrevivir hasta la edad adulta como se dispone en la Resolución Conf. 11.16 (Rev. CoP15).

En comparación se ha declarado muy poco comercio a la CITES de pangolines africanos. Sin embargo, se ha tratado principalmente de escamas y pangolines vivos en el último decenio. El comercio ha consistido en más de cinco toneladas de escamas, el equivalente a 5.500 pangolines estimados (véase el Anexo 1 para los métodos de conversión), y se trataba de *M. tricuspis* y *M. gigantea*, que fueron exportados del Congo, la República Democrática del Congo (DRC) y de Uganda a China. Asimismo, supuso la exportación de unos 1.000 pangolines vivos de *M. gigantea*, *M. tricuspis* y *M. tetradactyla* a China, Lao PDR y Viet Nam para fines de cría en cautividad (pese a que

los volúmenes de comercio comunicados difieren entre los importadores y los exportadores). La mayoría de este comercio de escamas y animales vivos fue de *M. tricuspis*.

A tenor de los datos disponibles comunicados por las Partes en sus respuestas a las Notificaciones a las Partes No. 2017/035 y No. 2014/059 y de los datos de la base de datos World WISE de la ONUDD, el comercio ilegal de pangolines entre 1999 y 2017 afectó a unos 192.576 pangolines, excediendo con mucho los niveles del comercio legal en ese periodo. Este comercio ilegal afectó a las ocho especies y se basa en las 1.557 confiscaciones realizadas en los Estados del área de distribución africanos y asiáticos y en los Estados que no son parte del área de distribución. La mayoría de esas confiscaciones se efectuaron en 2006 o posteriormente y, por ende, esos análisis pueden considerarse como una evaluación del tráfico de pangolines en el último decenio. La mayoría de este comercio implicó '*Manis* spp.', ya que las confiscaciones de pangolines raramente se declaran a nivel de especie. En caso contrario, *M. javanica* fue la especie que se encontró con mayor frecuencia en el comercio ilegal.

En términos de volumen, el comercio ilegal correspondió principalmente a pangolines vivos/muertos (48%) y escamas (48%) con un comercio mucho menor de carne (4%) y otros derivados (<1%). Sobre la base de la información disponible, el tráfico de pangolines vivos/muertos tuvo lugar principalmente en Asia, a lo largo de las rutas comerciales desde Indonesia a Viet Nam y luego a China. No obstante, Malasia y Tailandia también destacan como países de tránsito. En lo que concierne a las escamas, China y Viet Nam confiscaron los mayores volúmenes, siendo los principales países de origen y tránsito de Asia, entre otros, la India, Indonesia, Malasia, Myanmar, Nepal y Tailandia, así como Sierra Leona en África. Los países europeos parecen actuar como vías para el tráfico de escamas de África a Asia. En este sentido, y sobre la base de la información disponible, un notable comercio ilegal de escamas procedentes de Benin, Camerún, República Centroafricana, Côte d'Ivoire, DRC, Guinea Ecuatorial, Gabón, Guinea, Liberia y Togo, se traficaron a través de Bélgica, Francia, Alemania, Países Bajos y Reino Unido de Gran Bretaña e Irlanda del Norte, en su gran parte con destino a China, la Región Administrativa Especial de Hong Kong (RAE de Hong Kong) y Viet Nam. Cabe destacar también el comercio ilegal de escamas de Uganda, que transitó a través de Kenya con destino a China y Tailandia. Esos datos, combinados con la investigación científica existente sugieren que entre 2001 y 2016 se traficaron unos 18.000 pangolines cada año, pero que los niveles de comercio ilegal reales son mayores de lo que indican esos datos. De hecho, de la información de otras fuentes pone de relieve la alarmante tendencia de incautaciones voluminosas de escamas de pangolín africano en los últimos años, que ha afectado a unos 86.000 pangolines adicionales estimados.

Reglamentación de la explotación y utilización de los pangolines

Sobre la base de las respuestas a las Notificaciones a las Partes No. 2017/035 y No. 2014/059, 39 Partes han adoptado legislación para reglamentar el comercio internacional de especies nativas y no nativas de pangolines africanos y asiáticos. Sin embargo, hubo respuestas de varios países de la UE y reconociendo que la Normativa de la UE sobre el comercio de especies silvestres se aplica a todos los Estados miembros de la UE significa que es posible evaluar la legislación que regula el comercio internacional de pangolines para 66 Partes (es decir, todas las Partes que respondieron a las precitadas notificaciones y todos los Estados miembros de la UE. Sobre esta base, 21 Partes comunicaron que regulan el comercio internacional de especies nativas y no nativas de pangolines, y 12 Partes informaron de que regulan solamente el comercio internacional de especies nativas. Un total de 32 Partes, incluidos todos los Estados miembros de la UE, regulan únicamente el comercio internacional de especies no nativas de pangolines.

Cincuenta y dos Partes proporcionaron detalles sobre las penas mínimas y máximas por la caza furtiva y otras actividades ilegales en relación con los pangolines. Las penas varían desde multas que oscilan entre los 6 dólares de EE.UU. en Côte d'Ivoire hasta 880.000 dólares de EE.UU. en Francia, y las penas de prisión oscilan entre 14 días en Pakistán y cadena perpetua en China. Sobre la base de la información disponible, se efectúan detenciones y enjuiciamientos regulares y se imponen penas a los autores de los delitos que afectan a los pangolines en Francia, Indonesia, Kenya, Malasia, Nepal, Tailandia, Viet Nam y Estados Unidos de América.

Entre los desafíos en materia de aplicación de la ley identificados por los Estados del área de distribución de los pangolines cabe citar la falta de capacidad del personal de observancia para identificar los pangolines y sus partes y derivados en el comercio ilegal, y la falta de equipo y recursos (por ejemplo, escáneres, perros olfateadores) para detectar los derivados de pangolín objeto de tráfico. Los desafíos de observancia comunicados en Asia incluyen: i) aplicar las reglamentaciones del comercio de vida silvestre a lo largo de las fronteras internacionales; ii) controlar el comercio ilegal de pangolines que se realiza a través de Internet; y iii) garantizar la aplicación efectiva en zonas remotas donde prosperan los pangolines, inclusive en las plantaciones (por ejemplo, plantaciones de palma de aceite), especialmente en el contexto de los elevados precios que se ofrecen a los miembros de las comunidades locales por los pangolines, que constituye un poderoso incentivo para la caza furtiva.

Existencias y gestión de las existencias

Diecinueve Partes declararon que poseen existencias de derivados de pangolines. Oscilan en tamaño desde algunos especímenes de museo en Senegal hasta más de seis toneladas de escamas en Uganda. Doce Partes poseen existencias de escamas (Camerún, China, Italia, Kenya, Liberia, Nepal, Pakistán,

Singapur, Tailandia, Togo, Uganda y Estados Unidos). De la información disponible se desprende que China tiene existencias de escamas de tamaño desconocido y entre 2009 y 2016 el Gobierno de China sacó un promedio de 26 toneladas de escamas al año al mercado legal de China. Se requiere que esas escamas estén certificadas y están autorizadas para uso clínico en 716 hospitales designados en China y en la preparación de medicinas chinas patentadas. Sin embargo, las investigaciones recientes indican que se están vendiendo ilegalmente escamas sin certificar en varios lugares de China.

Identificación y fomento de capacidad

La mayoría de las Partes que proporcionaron información sobre la identificación y el fomento de capacidad declararon que los materiales de identificación actuales son inadecuados. El obstáculo más frecuentemente citado para cumplir con la legislación nacional en lo que concierne al comercio ilegal de pangolines fue los inadecuados materiales disponibles para poder identificar correctamente las diferentes especies de pangolines y sus derivados en el comercio legal e ilegal.

Poblaciones de pangolines en cautividad en la actualidad

Ocho Estados del área de distribución de los pangolines declararon que mantenían pangolines en cautividad en su país (China, Côte d'Ivoire, India, Indonesia, Malasia, Tailandia, Singapur y Viet Nam) y Estados Unidos. Esto incluye especímenes de *M. pentadactyla*, *M. javanica*, *M. crassicaudata* y *M. tricuspis*. Al menos 18 instituciones zoológicas en Asia, África, Europa y América del Norte mantienen pangolines, mientras que se sabe que otras 22 instituciones (por ejemplo, centros de rescate de especies silvestres) en Asia y África mantienen pangolines en cautividad.

Ninguna Parte comunicó que los pangolines se están criando en cautividad con fines comerciales, pero parece que se está desarrollando la producción o la cría en granjas comercial de pangolines. En su respuesta a la Notificación a las Partes No. 2017/035, Lao PDR indicó que una empresa comercial de vida silvestre había propuesto una instalación de cría en cautividad de pangolines en su país. Según los datos sobre el comercio de CITES, Lao PDR también importó 250 especímenes capturados en el medio silvestre de *M. tricuspis* y 50 especímenes capturados en el medio silvestre de *M. gigantea* en 2012, en el caso de estos últimos para fines de cría en cautividad. De igual modo, China importó 200 especímenes capturados en el medio silvestre de *M. tricuspis*, 200 especímenes capturados en el medio silvestre de *M. tetradactyla* y 100 especímenes capturados en el medio silvestre de *M. gigantea* de Nigeria en 2015 con fines de cría en cautividad. Asimismo, Viet Nam importó 200 especímenes capturados en el medio silvestre de *M. tricuspis* de Togo en 2012, probablemente por los mismos motivos. El desarrollo de la cría en granjas de pangolines se extiende también a África. En su respuesta a la Notificación a las Partes No. 2014/059, Uganda indicó que había concedido una licencia de cría en granjas a una empresa privada. Hasta donde saben los autores, se ha concedido una licencia

a una granja de pangolines para operar en Mozambique y ciertos informes sin confirmar sugieren que al menos una granja se ha establecido en Sudán.

Gestión de la demanda, la educación y la sensibilización

En sus respuestas al cuestionario, las Partes aportaron escasa información sobre los nuevos avances en relación con la gestión de la demanda y los pangolines, pese a que la información de otras fuentes indica que se están llevando a cabo muchas actividades para entender mejor y abordar la demanda de productos de pangolín. Once Partes informaron acerca de una amplia gama de actividades centradas en la educación, y 21 Partes sobre actividades para promover la sensibilización acerca de los pangolines y del comercio ilegal. Sin embargo, sigue siendo una necesidad crítica que las Partes y otros interesados que trabajan sobre la gestión de la demanda, la educación y la sensibilización midan el impacto de sus actividades y garanticen que los enfoques pueden modificarse cuando no se logren los resultados deseados o ampliarse a otros lugares cuando se demuestre que son exitosos.

Medidas de conservación en curso y necesarias

Históricamente se ha prestado escasa atención e inversión a la conservación de los pangolines. Sin embargo, esto ha comenzado a cambiar en los últimos años debido al creciente perfil de las especies vinculadas a elevados niveles de comercio ilegal. Hay una serie de actividades en curso relacionadas con la conservación, inclusive la investigación centrada en la biología, ecología y comercio, los esfuerzos de aplicación de la ley, y los esfuerzos para abordar la demanda de productos de los pangolines. Sin embargo, hay una serie de medidas que es preciso aplicar con carácter urgente para conservar directamente o apoyar la conservación de los pangolines. Estas incluyen, entre otras:

- el desarrollo de estrategias de conservación regionales y nacionales para guiar a las Partes y a otros interesados en la conservación sobre las medidas para conservar los pangolines;
- el desarrollo de métodos de control que puedan ensayarse sobre el terreno y evaluarse para garantizar que son precisos y fiables y pueden integrarse en la gestión de la conservación;
- el desarrollo de una carpeta de recursos para el comercio de pangolines con los siguientes componentes: (i) materiales de identificación para los pangolines y sus derivados en el comercio para el personal de observancia de primera línea; (ii) protocolos normalizados para obtener muestras de confiscaciones de grandes volúmenes de escamas de pangolines; (iii) orientación sobre la disposición inmediata y a largo plazo de los animales vivos; y (iv) un catálogo de instalaciones de alojamiento adecuadas para la disposición a largo plazo de los pangolines vivos;
- los análisis regulares de los pangolines y sus derivados en el comercio ilegal para facilitar la adopción de decisiones de la CITES. Esto puede basarse en los informes de comercio ilegal

enunciados en la Resolución Conf. 11.17 (Rev. CoP17), combinado con otros datos disponibles sobre el comercio ilegal de pangolines.

- la determinación de sitios prioritarios en los que concentrar los esfuerzos en pro de la conservación de los pangolines, incluyendo la participación con las comunidades locales; y
- la evaluación sobre si la cría en granjas de pangolines ofrece una posible solución de conservación centrada en el suministro para los pangolines o si, por el contrario, acentuará la sobreexplotación de los pangolines y el comercio ilegal.

1. Introduction

At the 17th meeting of the Conference of the Parties to CITES (CoP17, Johannesburg, 2016), all eight species of pangolin (the Chinese pangolin *Manis pentadactyla*, Sunda pangolin *M. javanica*, Indian pangolin *M. crassicaudata*, Philippine pangolin *M. culionensis*, giant pangolin *M. gigantea*, black-bellied pangolin *M. tetradactyla*, white-bellied pangolin *M. tricuspis*, and Temminck's ground pangolin *M. temminckii*) were transferred from Appendix II to I. The Parties also adopted Resolution. Conf. 17.10 on *Conservation of and trade in pangolins* and Decisions 17.239 and 17.240 on pangolins (*Manis* spp.).

Decision 17.239, paragraph b) directs the CITES Secretariat to, subject to external funding, prepare in cooperation with relevant organisations, and in consultation with range and implicated States, a report to be made available to the 69th meeting of the CITES Standing Committee (SC69, Geneva, November 2017), on:

- i) the national and global conservation status of African and Asian pangolin species;
- ii) available information about levels of legal and illegal trade;
- iii) relevant information on enforcement actions taken, including seizures, forensic analysis of seized specimens, arrests, prosecutions and judgments relating to illegal trade in pangolins as well as disposal of seized specimens;
- iv) stock-piles of specimens and derivatives of pangolins and stockpile management including existing registration systems;
- v) inventories of current captive pangolin populations, including breeding data and mortality rates, in zoos, rehabilitation centres and other captive facilities and new developments on captive-breeding activities; and
- vi) new developments regarding specific demand management, education and awareness-raising measures concerning pangolins.

Decision 17.240 in addition to the above, directs the CITES Secretariat to formulate recommendations for consideration at SC69, and draft decisions for consideration by the Standing Committee and the Conference of the Parties, as appropriate.

In March 2017, having acquired the necessary external funding, the CITES Secretariat contracted the International Union for Conservation of Nature (IUCN) to prepare the report discussed in Decision 17.239 paragraph b), in cooperation with relevant organisations and in consultation with range and

implicated States, and to engage with range and implicated States in accordance with the provisions of Decision 17.240.

2. Methodology

To inform this report IUCN developed a questionnaire 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. 2017/035, asking the Parties to complete the questionnaire and submit it to IUCN. IUCN also emailed range States and implicated Parties using email addresses available on the CITES website requesting the submission of completed questionnaires. IUCN received responses to the Notification from 37 Parties, comprising eight from African pangolin range States (Angola, Central African Republic, Côte d'Ivoire, Kenya, Liberia, Namibia, Nigeria and Senegal), nine from Asian pangolin range States (Cambodia, India, Indonesia, Lao People's Democratic Republic (PDR), Malaysia, Nepal, Pakistan, the Philippines and Thailand), and 18 from non-range States (Austria, Bahrain, Bulgaria, Comoros, Denmark, Finland, France, Georgia, Greece, Ireland, Japan, Monaco, Montenegro, the Netherlands, Spain, Sweden, Switzerland, Tunisia and the United States of America (U.S.), as well as the European Union (EU). The EU provided seizure data (relating to question 6 in the questionnaire on seizures) but did not complete the questionnaire in full. Hong Kong Special Administrative Region (Hong Kong SAR) provided responses to selected questions from the questionnaire to the authors via email.

To further inform this report, responses from Parties to the questionnaire developed by the CITES Standing Committee inter-sessional working group on pangolins in 2015 (see Notification to the Parties 2014/059) were consulted and where Parties responded to that questionnaire but not to Notification to the Parties 2017/035, responses from 2015 have been included in this report to ensure it is as comprehensive as possible. This includes responses from the following 23 Parties: Bangladesh, Benin, Bhutan, Botswana, Brunei Darussalam, Cameroon, Chad, China, Côte d'Ivoire, Gabon, Ghana, Italy, Latvia, Myanmar, Singapore, Slovakia, South Africa, Togo, Uganda, United Republic of Tanzania, Viet Nam, Zambia, and Zimbabwe. This report is therefore based on information submitted by 61 Parties.

Additionally, a review of relevant scientific literature was conducted; trade data on pangolins were downloaded from the CITES Trade Database (UN Environment World Conservation Monitoring Centre, Cambridge, UK) and analysed (see Section 6.1); and relevant information was obtained from the International Consortium on Combating Wildlife Crime (ICWC) partners, in particular seizure data from the United Nations Office on Drugs and Crime (UNODC) World WISE database.

Finally, information on the status of pangolins and the impact of international and domestic legal and illegal trade (including poaching) on pangolin populations, and demand reduction, awareness-raising and education measures were also requested from international conservation organisations to inform respective sections of this report. These organisations were the IUCN Species Survival Commission Pangolin Specialist Group, the Wildlife Conservation Society, Fauna & Flora International, World Wildlife Fund, TRAFFIC and the Rainforest Trust.

In this report information received from the CITES Parties is presented in each section followed by information available from other sources where applicable. Details on the methods used to estimate the number of pangolins in legal trade and illegal trade can be found in Annex 1.

3. Introduction to pangolins

Pangolins (Pholidota: Manidae) are placental mammals covered in overlapping scales comprised of keratin. There are eight extant species, four of which occur in Asia, the Chinese pangolin *M. pentadactyla*, Sunda pangolin *M. javanica*, Indian pangolin *M. crassicaudata* and Philippine *M. culionensis*, and four that are native to Africa, the black-bellied pangolin *M. tetradactyla*, white-bellied pangolin *M. tricuspis*, giant pangolin *M. gigantea* and Temminck's ground pangolin *M. temminckii*. Collectively they occur in habitats ranging from tropical and sub-tropical forests (including bamboo and coniferous forests), riverine and swamp forests, to savannah woodland and grasslands, and artificial landscapes including gardens and plantations (Challender et al., 2014a; Kingdon et al., 2013).

Predators of ants and termites, pangolins are myrmecophagous and provide an important ecosystem service by regulating social insect populations. They lead principally arboreal or fossorial lifestyles and are primarily nocturnal (Kingdon et al., 2013). They are also solitary, except when mating or rearing young, and each species typically gives birth to one young at parturition after a gestation period of approximately six months. All species of pangolin share a basic morphology, but can be distinguished by, *inter alia*, size, weight, scale disposition and morphology (e.g., size, colour), tail length, the presence/absence of tail pads, and a range of osteological differences (Pocock 1924).

The best available research indicates that pangolins evolved around 80 million years ago and that modern pangolins potentially had a European origin followed by dispersal into sub-Saharan Africa and subsequently Asia (Gaudin et al., 2009). The same research splits the eight species into three genera: *Phataginus* for the arboreal African species (the black-bellied pangolin and white-bellied pangolin), *Smutsia* for the ground-dwelling African species (the giant pangolin and Temminck's ground pangolin), and *Manis* for the Asian species. However, the mammalian taxonomic reference used by CITES (Wilson & Reeder 2005) considers all eight species to reside in the genus *Manis*.

In Asia, pangolins have a widespread distribution. This extends from northern and eastern Pakistan, south throughout the Indian subcontinent including Sri Lanka, and from the Himalayan foothills east, including Bhutan, Nepal and Bangladesh, Southern China, including Taiwan, Province of China and Hong Kong SAR, and south throughout mainland and island Southeast Asia, and the Palawan faunal region in the Philippines. Pangolins also occur across sub-Saharan Africa. Three species (*M. tetradactyla*, *M. tricuspis* and *M. gigantea*) occur in west and central Africa, while *M. temminckii* ranges across east and southern Africa and parts of central Africa. Despite a broad distribution, pangolins are understudied and there is a lack of quantitative information on the status of populations from local to global levels (Challender et al., 2014a; Waterman et al., 2014a).

4. The listing of pangolins in the CITES Appendices

Pangolins have a long history in CITES. In 1975 *M. pentadactyla*, *M. javanica* and *M. crassicaudata* were listed in Appendix II and *M. temminckii* in Appendix I. In 1994, *M. temminckii* was transferred from Appendix I to Appendix II, and all remaining species were included in Appendix II as the genus *Manis* was listed in this Appendix. In 2000, *M. pentadactyla*, *M. javanica* and *M. crassicaudata* were subject to a proposal to transfer them to Appendix I. However, the proposal was not adopted because at the time the species were still in the Review of Significant Trade (RST) process. Instead, the Parties adopted zero export quotas for wild-caught Asian pangolins traded for primarily commercial purposes. At CoP17 (Johannesburg, 2016), all eight species of pangolin were transferred from Appendix II to I. CoP17 also adopted Resolution Conf. 17.10 on *Conservation of and trade in pangolins*.

Based on concerns over the sustainability of trade reported to CITES, particularly skins, *M. pentadactyla*, *M. javanica* and *M. crassicaudata* were included on three occasions in the Review of Significant Trade process in 1988 (preliminary Phase), 1992 (Phase I) and 1999 (Phase IV). The Reviews conducted in 1992 and 1999 resulted in recommendations for various range States. In 1999, the Standing Committee recommended to all Parties that no export or re-export permits or certificates be issued, or accepted, for Asian pangolins until, to the satisfaction of the Secretariat, Asian pangolin range States had implemented a series of measures demonstrating compliance with Article IV of the Convention. As zero export quotas were established for these species at CoP11 (Kenya, 2000), the Standing Committee, at SC45 (Paris, 2001), agreed that if zero quotas were removed any range State wishing to trade in these species should satisfy the Secretariat that the 1999 recommendations had been implemented before any export took place.

The African species were also included in the RST process in 1999, but were eliminated from the process on the basis that trade levels were not of concern. *Manis gigantea* and *M. tricuspis* were selected for the RST as species of priority concern in 2013. At AC28 (Tel Aviv, 2015), the Animals Committee decided to retain in the RST all range States for these species that do not fully protect them through national legislation (with the exception of the United Republic of Tanzania which was the only range State to provide a response to the Secretariat). However, CoP17 adopted amendments to Appendices I and II of the Convention which, *inter alia*, transferred *M. gigantea* and *M. tricuspis* from Appendix II to Appendix I, making further activities under the RST process no longer relevant for these species: trade in specimens of *Manis* spp. is to be conducted in accordance with Article III (and VII) of the Convention (i.e. trade in species included in Appendix I), and no longer Article IV (Appendix II).

5. National and global conservation status

Information provided by Parties in response to Notifications to the Parties No. 2017/035 and 2014/059 where applicable, is presented in sections 5.1 and 5.2. Additional information from other sources is presented in sections 5.1.1. and 5.2.1.

5.1 Status of Asian pangolins

Nine Asian pangolin range States reported in their responses to the above Notifications that recent information exists about the conservation status of pangolins in their country and provided additional information: Bangladesh, China, Indonesia, Nepal, Pakistan, the Philippines, Thailand, Singapore and Viet Nam, as detailed below. Additional information provided by Bangladesh was limited to indicating that the population in the country declined in the period 2010-2015. Seven range States reported that recent information about the conservation status of pangolins in their country does not exist and/or that pangolins are considered data deficient: Bhutan, Brunei Darussalam, Cambodia, India, Lao PDR, Malaysia and Myanmar. However, Brunei Darussalam reported in response to Notification to the Parties No. 2014/059 that its population increased between 2010 and 2015 but also reported it to be data deficient. Malaysia reported that despite pangolins being considered data deficient in the country, *M. javanica* is present in a number of agricultural and protected areas in the state of Sarawak.

China reported in response to Notification to the Parties No. 2014/059 that its population declined between 2010 and 2015. In China, *M. pentadactyla* is mainly distributed in the south of the country, to the south of the Yangtze River. Wu et al. (2004) report that it is very rare in the countries bordering Guangxi and Yunnan provinces in Southern China and that populations of this species in China and its border regions have declined by up to 94% (also see Li 2010).

In Indonesia, 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. *Manis javanica* 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, Kepulauan 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 & Sawitri 2016). Interviews with poachers conducted 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), presumably due to the animals being less abundant. Takandjandji & Sawitri (2016) estimate that between 2002 and 2015, as many as 319,460 Sunda pangolin were trafficked from Indonesia and mainly destined for China, which is driving poaching and international trafficking of the species (Semiadi et al., 2008).

Nepal stated in its questionnaire responses that there is a deficiency of data for their wild pangolin populations, but also reported that based on a National Pangolin Survey conducted in 2016 that 53 districts in Nepal (comprising 20,750 km²) are considered to comprise suitable pangolin habitat. In addition, the presence of pangolins has been confirmed in 43 districts in Nepal, including 14 identified as pangolin hotspots, though there have been no records of pangolin presence in 32 districts. Four districts are reported to have confirmed presence of *M. crassicaudata* and 25 districts the presence of *M. pentadactyla*.

In Pakistan, although detailed studies have not been conducted to evaluate the population status and trends nationally, it is believed that the pangolin population is declining. A preliminary assessment of *M. crassicaudata* in the Potohar region of Pakistan in Northern Punjab was conducted between December 2013 and May 2014 by the Zoological Survey of Pakistan and the Ministry of Climate Change in collaboration with WWF-Pakistan. It determined that the species is declining rapidly in this region (also see section 5.1.1).

The Philippines reported in its questionnaire responses that *M. culionensis* was listed as Vulnerable under the Department of Environment and Natural Resources (DENR) Administrative Order 2004-15. However, effective 2nd January 2017, all species listed in CITES Appendix I including the Philippine pangolin, are considered Critically Endangered by the Philippines which provides a higher level of protection and penalties under the Republic Act 9147 (Wildlife Resources Conservation and Protection Act). *Manis culionensis* occurs in a range of habitat though it is understood to occur in higher densities in primary forest than in mixed residual forest and brushland. Available information suggests that *M. culionensis* populations are declining due to ongoing exploitation both for subsistence use and increasingly for international trade, which is being exacerbated by degradation of suitable forest habitat (Bayron 2014; Lagrada 2012; Schoppe & Alvarado 2015). According to local hunters, monthly catch has decreased from an average of 12 pangolins in the 1990s to only one pangolin/month in 2013 (though in some months zero pangolins were caught) suggesting that populations are decreasing (Schoppe & Alvarado 2015).

In Singapore, *M. javanica* is mainly distributed in the Central Catchment Nature Reserve and Bukit Timah Nature Reserve, but can also 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). The animals sometimes wander into residential areas from nearby woods. No detailed studies have been conducted on populations of pangolins in Singapore though research on wild populations and the impact of roadkill is currently ongoing.

In Thailand, both *M. pentadactyla* and *M. javanica* are rarely observed and little information exists on their conservation status. However, populations are stated to have declined in the last five years due to collection for local use and international trade, including poaching and illegal trade in live pangolins, which seems to have intensified in recent years and it is believed to be having a detrimental impact on populations. Many pangolins have been confiscated from illegal traders in the country in recent years. *Manis pentadactyla* was listed as Endangered in 2005 (Nabhitabhata & Chan-ard 2005).

Viet Nam reported in its questionnaire response in 2015 that pangolin populations in the country declined between 2010 and 2015. This is supported by research conducted in the last decade in which hunters revealed that in three areas of Viet Nam populations of *M. javanica* declined dramatically in the last few decades due to hunting/poaching, in particular since the 1990s, and that this species is now rare (Newton et al., 2008).

5.1.1 Information from other sources

Information from other sources, including published literature and global and national assessments of extinction risk provide further details on the conservation status of Asian pangolins.

5.1.1.1 *Manis pentadactyla*

Manis pentadactyla is native to Bangladesh, Bhutan, China, Hong Kong SAR, India, Lao PDR, Myanmar, Nepal, Taiwan Province of China, Thailand and Viet Nam (Fig. 1; see Challender et al., 2014a; Trageser et al., 2017). The conservation status of the species has been assessed at the global, and in some cases at national level. In 2014, *M. pentadactyla* was assessed at the global level as Critically Endangered (A2d+3d+4d) on The IUCN Red List of Threatened Species™ on the basis of past, on-going and future population declines over a time period of three generations (21 years, generation length estimated at seven years). There are predicted continuing declines of $\leq 90\%$ over the next three generations (21 years). These declines are based on high levels of hunting and poaching for meat and scales, both historic and contemporary, and which has involved an estimated tens of thousands of animals in illegal international trade in the last decade, with evidence suggesting that poaching has now shifted to the south and west of this species' range (Challender et al., 2014a). Other recognised threats at the global level are habitat loss and degradation caused by shifting cultivation and conversion of forests to permanent agricultural crops, industrial tree plantations, particularly palm oil, and

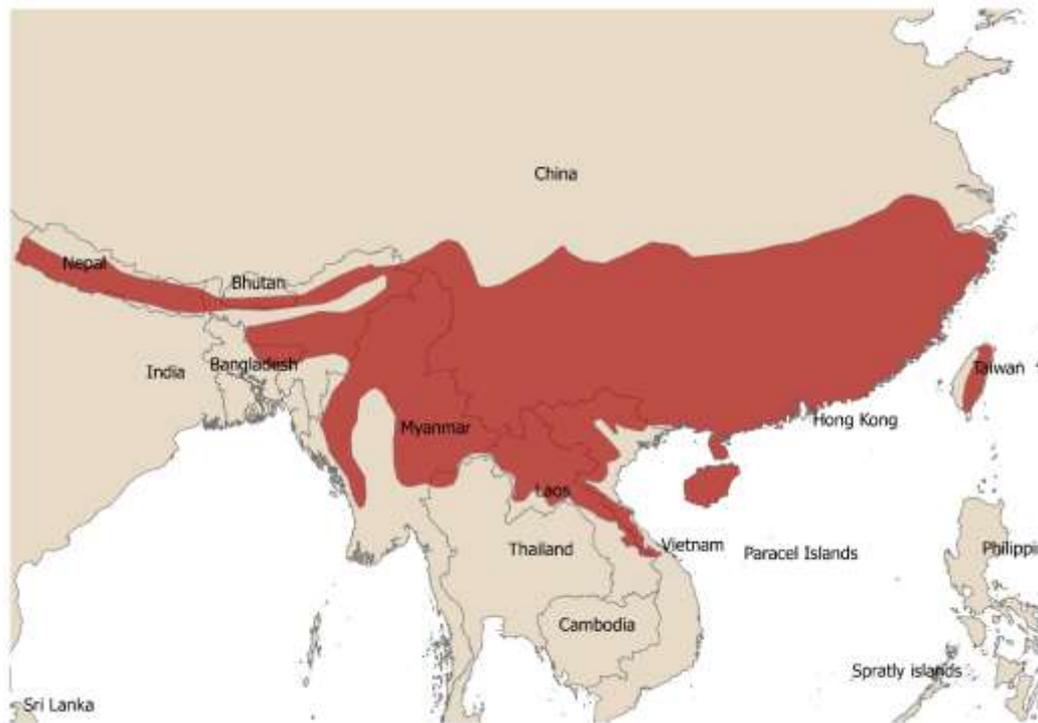


Fig. 1. Distribution of *M. pentadactyla*. Source: Challender et al. (2014a). N.B. This map does not reflect information on pangolin distribution in Bangladesh presented in Trageser et al. 2017 (see main text).

electrocution by electric fences. However, there remains a need a better understand the ability of this species to persist in artificial landscapes, for example plantations. Further information on the status of this species in its range States is provided below.

Bangladesh – This species occurs in northwest, northeast and southeast Bangladesh in natural and degraded habitats (Trageser et al., 2017). A small number of *M. pentadactyla* were reportedly killed by hunters in 2015 in the Chittagong Hill Tracts region, with hunter accounts being suggestive of, and local villages claiming, that the species was extirpated from most of this region by 2014 due to advent of commercial pangolin poaching in 2010. Evidence indicates the species is present in Lawachara National Park and potentially in the surrounding protected areas and tea estates (Trageser et al., 2017).

Bhutan – *Manis pentadactyla* occurs in southern Bhutan, though potentially in central and western areas of the country only, where it is confined to elevations below 2000m above sea level (Challender et al., 2014a; Srinivasulu & Srinivasulu 2012; Baral & Shah 2008). Little is otherwise known about the status of the species 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 (Zhigang et al., 2015). The population was estimated to comprise 50,000 to 100,000 animals in 2002 (Wu et al., 2002a), 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 (Zhang 2008). This number did decline to a few thousand animals by the 1990s (Zhang 2008), which coincides with reports at the time highlighting the likely commercial extinction of the species (e.g., Zhang et al., 2008; SATCM 1996). There are infrequent sightings of *M. pentadactyla* in Guangdong, Guangxi and Yunnan provinces (some in the last few years), where *M. pentadactyla* is considered very rare, as well as Zhejiang province (Zhang et al., 2017). There are also reported sightings of *M. pentadactyla* in Anhui province. The population of the subspecies on Hainan Island, *M. p. pusilla*, is considered to have declined severely, to the point of commercial extinction due to past and ongoing exploitation (Nash et al., 2016). However, in Taiwan Province of China, where some consider this species to be replaced by a subspecies, *M. p. pentadactyla* (see Chao et al., 2005), it has reportedly recovered in some places from historical reductions and estimated densities in some areas comprise 12 to 13 adult pangolins/km² (J. Pei *in litt.* to the authors 2016).

Hong Kong SAR– This species is considered to be widespread in Hong Kong SAR, having been recorded inside and outside the country park network, but is rare (Challender et al., 2014a). Experts in Hong Kong consider very low poaching pressure on local populations (Ades, G. *in litt.* to the authors, 2017).

India - There is little information on the population status of this species in India. However, 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 (e.g., Mohapatra et al., 2015).

Lao PDR – There were two field sightings during 1994-1995 but such sightings are now extremely rare primarily due to exploitation historically (Nooren & Claridge 2001; Challender et al., 2014a).

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).

Nepal - The population in Nepal was estimated at approximately 5,000 individuals in 2011, when the species was assessed as Endangered nationally using IUCN's Red List Categories and Criteria and is believed to be in decline (Jnawali et al., 2011). Little is otherwise known about the status of the species in Nepal.

Thailand – This species occurs in northwest Thailand though the only records are from Doi Inthanon in Changwat, Chiang Mai and Doi Sutep in the early 1900s (Challender et al., 2014a). As noted in section 5.1, this species was listed as Endangered in Thailand in 2005 (Nabhitabhata & Chan-ard 2005).

Viet Nam – This species' range in Viet Nam is confined to the north of the country as far south as Quang Tri province (Challender et al., 2014a). 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 it is now extremely rare and that populations have declined dramatically over the past two decades (Newton et al., 2008; Newton 2007).

5.1.1.2 *Manis javanica*

Manis javanica is native to Brunei Darussalam, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand and Viet Nam (Fig. 2; see Challender et al., 2014b; Zhigang et al., 2015). It was assessed as Critically Endangered (A2+3d+4d) on The IUCN Red List of Threatened Species™ in 2014, on the basis of suspected past, on-going and future population declines. There have been suspected declines of $\leq 80\%$ over the last 21 years (generation length estimated at seven years) and projected declines of $\geq 80\%$ over the next 21 years. These declines are based on high levels of hunting and poaching for domestic use and for illegal international trade, primarily to parts of East Asia and Southeast Asia for the consumption of meat and use of scales in traditional medicines, and based on available information, corresponding population declines in range States. *Manis javanica* is considered extremely rare in the north of its range, with the intensity of poaching now occurring in the southern part of the species' range (Challender et al., 2014b). Other recognised threats include roads (from roadkill) and water management systems (i.e. the creation of dams). However, like for *M. pentadactyla* there remains a need a better understand the ability of this species to persist in artificial landscapes, Additional information on the status of this species in its range States is provided below.

Brunei Darussalam – This species has been reported in all four districts of Brunei Darussalam (Brunei Muara, Tutong, Kuala Belait and Temburong) but little is known about the status of the species (Fletcher 2016). However, recently conducted interviews with local people 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). Between 2013 and April 2015, a local wildlife club (1stopbrunei) released 11 pangolins that were either found for sale online or were handed to members of the wildlife club by the public on finding them around their homes. Evidence indicates the species continues to be offered for sale through social media (Fletcher 2016).

Cambodia – This species is present in a number of forest reserves in Cambodia (e.g., the Cardamom Mountains, the Elephant Mountains, Central Cambodian Lowland Forests (Prey Long), Eastern Plains

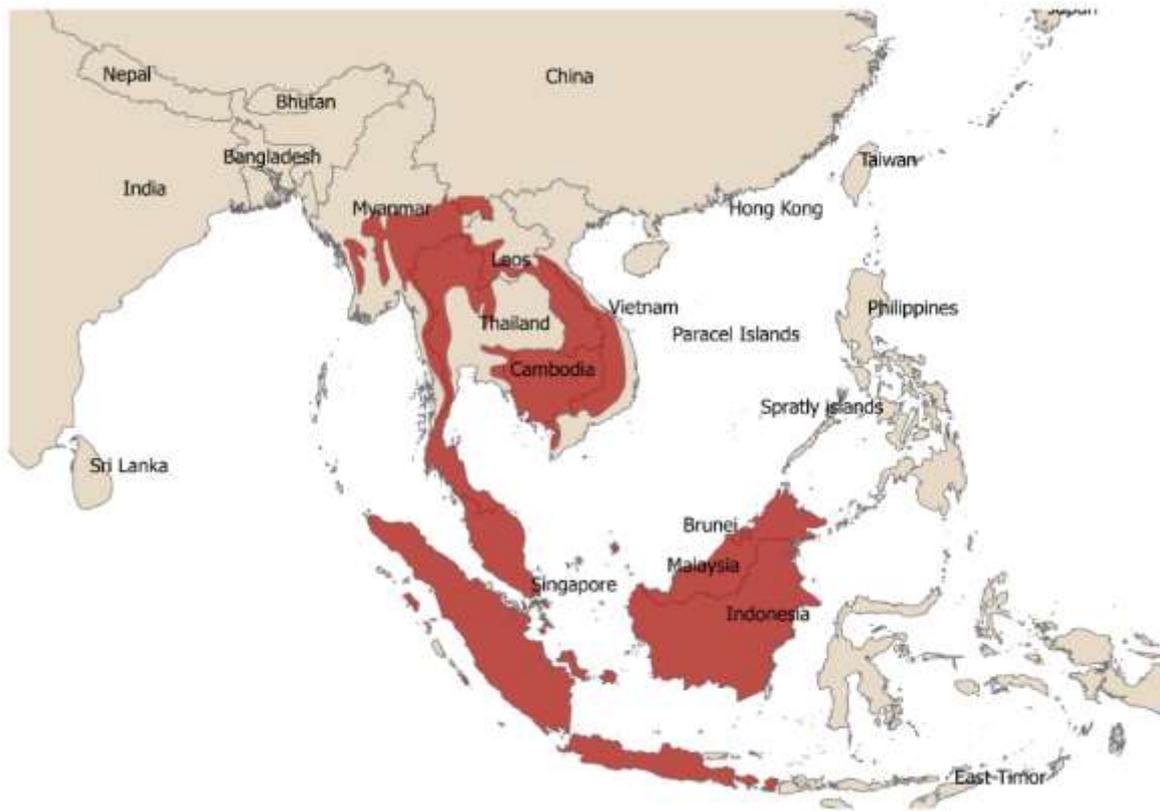


Fig. 2. Distribution of *M. javanica*. Source: Challender et al. (2014b).

Landscape, Northern Plains and Northeast Cambodia). This species inhabits evergreen, semi-evergreen and deciduous forest where there are appropriate food and water sources. But, populations are considered to be declining. Hunter interviews suggest the species has been extirpated from some areas due to hunting (Challender et al., 2014b). Cambodia categorised the species as ‘rare’ in 2007

China – *Manis javanica* is marginally present in China, occurring only in Yunnan province in the Southwest of the country. However, it should be noted that this is based on museum records only (Wu et al., 2005). This species is listed as Data Deficient in China’s Red Data book for mammals (Zhigang et al., 2015).

Indonesia – This species has a widespread distribution in Indonesia which includes Sumatra, Java, Borneo, Kiau and the Linangga archipelago, Bangka and Belitung, Nias and Pagi islands and Bali and adjacent islands (Corbet & Hill 1992). Notwithstanding the information presented above on status in Indonesia, little is otherwise known in terms of population numbers, though *M. javanica* is understood to be of low abundance in the peat swamp forests of east and central Kalimantan (Challender at al. 2014b). As noted in section 5.1 Takandjandji & Sawitri (2016) estimate that between 2002 and 2015, as many as 319,460 Sunda pangolin were trafficked from Indonesia, mainly to meet demand for meat and scales in China (Semiadi et al., 2008).

Lao PDR – There is little recent information on the status of *M. javanica* in Lao PDR. Although it 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 (Challender et al., 2014b; Nooren & Claridge 2001).

Malaysia – *Manis javanica* has a wide distribution in Peninsular Malaysia (including on the island of Penang) and occurs in tropical forests, including in national parks and wildlife reserves, but also gardens and plantations (e.g., rubber, oil palm) (Numata et al., 2005). 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 & Thomas 2003). Interviews with hunters and villagers, including Orang Asli hunters, in various parts of Peninsular Malaysia, including Kelantan, Pahang, Terengganu, and Johor, suggest that populations are declining (Chong et al., 2016; Challender et al., 2014b). The species was listed as Vulnerable in Peninsular Malaysia in 2012.

In Sabah, *M. javanica* has previously been considered common (see Challender et al., 2014b). Although there is relatively little recent data on the species' status here, it is present in a number of forest reserves, wildlife reserves and wildlife sanctuaries. Yet, interviews conducted in and around Sepilok-Kabili Forest Reserve and the Lower Kinabatangan Wildlife Sanctuary in the last few years suggest that populations are declining (Elisa Panjang *in litt.* to the authors, 2017). *Manis javanica* is under demonstrable collection pressure in Sabah, for example between 2007 and 2009, more than 22,000 pangolins were collected in the state for illicit export to East Asia (Pantel & Anak 2010).

Manis javanica is present in Sarawak (e.g., Wilson 2006) and though there is little information on its current status, populations are reportedly declining (Ju lian Chong *in litt.* to the authors, 2017).

Myanmar – *Manis javanica* is distributed in central and southern Myanmar, but has reportedly been eradicated from lowland areas due to hunting and agricultural expansion (Challender et al., 2014b). However, it has recently (in the last three years) been recorded in Tanintharyi region in Southern Myanmar (Mark Grindley/FFI Myanmar *in litt.* to the authors, 2017), and recent observations of *Manis* spp. in Karen state most likely refer to *M. javanica* (Moo et al., 2017).

Singapore – This species is found in the wild in Singapore and populations are considered stable based on the frequency of sightings. Roadkill is considered the biggest threat to the species and though poaching does occur it is not thought to be significant (Challender et al., 2014b). In 2008, Singapore listed *M. javanica* as Critically Endangered using the IUCN Red List Categories and Criteria.

Thailand – *Manis javanica* has a broad distribution in Thailand (Legakul & McNeely 1977). It has reportedly been lost from much of the lowland areas within its range due to hunting and agricultural expansion (Challender et al., 2014b). Although reportedly increasingly rare in the country, it has been detected in a number of national parks in the last decade.

Viet Nam – This species' distribution comprises the central and southern parts of Viet Nam, including the provinces of, *inter alia*, Kon Tum, Tay Ninh and Quang Nam, Ha Tinh, Kien Giang and Ca Mau, and Dong Nai, Bun Phuoc, Lam Dong and Dak Lak (Newton et al., 2008; Challender et al., 2014b). Recent enforcement activity suggests the species is still present in Dak Nong, Kon Tum, Quang Binh and Gia Lai provinces, as well as U Minh Thoug and U Minh Ha National Parks (Challender et al., 2014b). Similarly, there is a record of the species from Nghe An Province from 2016-2017. As noted in section 5.1 research conducted in the last decade revealed that hunters in three areas of Viet Nam believed populations of this species to have declined dramatically in the last few decades due to hunting/poaching, in particular since the 1990s, and is now rare (Newton et al., 2008; Newton 2007). Other recent research corroborates these reports (Nuwer & Bell 2013; MacMillan & Nguyen 2013). *Manis javanica* was listed as Endangered in the Viet Nam Red Data Book in 2007.

5.1.1.3 *Manis crassicaudata*

Manis crassicaudata is native to India, Nepal, Pakistan and Sri Lanka (Fig. 3; Baillie et al., 2014). There are also historical records of a marginal distribution in Yunnan province, China (Zhigang et al., 2015), and its presence in Bangladesh is possible but uncertain (Trageser et al., 2017). There are dubious records from Myanmar (Ballie et al., 2014). This species was assessed at the global level as Endangered (A3d+4d) on The IUCN Red List of Threatened Species™ in 2014. This was on the basis of historical and future declines due to poaching for its meat and scales, both for local use and for illegal international trade, including the transfer of trade attention to this species given declines in populations of other species of Asian pangolin, namely *M. pentadactyla* and *M. javanica*. It is suspected *M. crassicaudata* populations will decline by at least 50% in the next 21 years (generation length estimated at seven years). Other recognised threats to the species include shifting agriculture and agricultural expansion (Baillie et al., 2014). Additional information on the status of this species in its range States is provided below.

Bangladesh – There is much uncertainty over the presence of *M. crassicaudata* in Bangladesh (Trageser et al., 2017), but it was categorised as Vulnerable in the country in 2005 using the IUCN Red List Categories and Criteria, based on past and future population declines.



Fig. 3. Distribution of *M. crassicaudata*. Source: Baillie et al. (2014).

China – Although some sources have considered China a range State for this species based on historical records of the species in the southwest of the country (Yunnan Province, Heath 1995; Smith and Xie 2008), there is serious doubt surrounding the validity of these records and no known recent evidence of presence. China lists this species as Data Deficient in its Red Data book for mammals (Zhang et al., 2015).

India – This species has a wide distribution in India from the foothills of the Himalayas to the south of the country, though excluding north-eastern states (Tikader 1983; Baillie et al., 2014). 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 of 30 districts in Orissa based on animals that have been rescued (CITES 2000). Srinivasulu and Srinivasulu (2012) state this species also occurs in Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Maharashtra and Uttarakhand. The overall status of this species is not known in India and there is a lack of quantitative population data. However, 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 this species remains subject to poaching pressure (Mohapatra et al., 2015). Research conducted in Chiplun taluka (an area of approximately 10,000 km² in Ratnagiri district, Maharashtra) in 2016 suggests that *M. crassicaudata* is present in 90 out of 164 villages in this area (Anon. 2017).

Nepal – *M. crassicaudata* is distributed in lowland areas of southern and western Nepal, including in a number of national parks and wildlife reserves (Baillie et al., 2014). It was assessed at the national level in Nepal as Endangered (B1ab (iii, v)) using the IUCN Red List Categories and Criteria in 2011 based on its geographic range in the country being estimated at <5,000 km², and 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 the number of mature individuals. Jnawali et al. (2011) report the species has an extent of occurrence of approximately 3,000 km² 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 (Suwal *in litt.* 2017).

Pakistan – In Pakistan, *M. crassicaudata* is locally distributed. It has been recorded in all four provinces in the country. In the north this includes Khyber Pakhtunkhwa (Kohat, Mardan, Nowshera, Peshawar and Swabi districts) and Punjab (Chakwal, Rawalpindi, Sialkot, Jhelum, Attock, Gujrat, Bhakar and Jhang districts) (Roberts, 1977; Baillie et al., 2014). It is also present in the Potohar Plateau region, including in 8 out of 10 protected areas (Mahmood et al., 2017), and in Azad Jammu and Kashmir (Kotli, Mirpur and Bhimber districts). Further south, the species has been recorded in Sindh Province (Dadu and Larkana districts) and east of the Indus River in Hyderabad district, and Tharparkar, extending eastwards to Kutch (Roberts 1977, Baillie et al., 2014). It has also been recorded in Balochistan (Mekran and Lasbela districts). The species was described as rare in 1986, and was listed as Vulnerable (A2c+3c+4c) nationally using IUCN's Red List Categories and Criteria in 2005 on the basis of past and future population declines. Although there is little quantitative population data for this species, it has been estimated that the average population density in the Potohar Plateau region declined by 80% between 2010 and 2012, from approximately one individual per km² to one every 5km² (Mahmood et al., 2014). This decline has been attributed to illegal killing of the animals for their scales for export to East Asia and has included over 400 animals in the last few years (Mahmood et al., 2014). Similarly, more than 500 animals were killed illegally for similar reasons in the same time period in Azad Jammu and Kashmir (Tariq Mahmood *in litt.* to the authors 2016).

Sri Lanka – *Manis crassicaudata* is reportedly found throughout the lowlands of Sri Lanka, coinciding with the range of termites (Baillie et al., 2014). There is little quantitative population data available on the species in Sri Lanka but it is understood to be of variable abundance, though seldom observed (Perera et al., 2017). Pabasara (2016) reported a population density of 5.69 individuals/km² in tropical lowland rainforest though they acknowledge that this does seem high, especially compared to population densities elsewhere (e.g., Pakistan). Pabasara et al., (2015) also suggested the species is potentially more abundant in pine-dominated forest, over other habitats, due to a greater abundance of prey. The species is consumed as bush meat in Sri Lanka and interviews with local hunters and community members in the Southwest of the country have revealed that exploitation is potentially

leading to population declines and possible eradication in some places (Perera et al., 2017; Karawita et al., 2016). The main exploitative threat to *M. crassicaudata* in Sri Lanka is from local hunters, and since the year 2000 there have been only two attempted cases of smuggling *M. crassicaudata* scales from the country (in 2012 and 2016) and in both cases the perpetrators were attempting to smuggle the scales to India (Perera et al., 2017). Other threats in Sri Lanka include rapid loss and deterioration of habitats, agricultural expansion, *ad-hoc* use of pesticides and road-kills (Chakkaravarthy 2012; Karawita et al., 2016). In 2005 Sri Lanka assessed *M. crassicaudata* as Data Deficient using IUCN's Red List Categories and Criteria.

5.1.1.4 *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 Dumarán Islands and it has been introduced to Apulit Island (Fig. 4; Lagrada et al., 2014). It was assessed at the global level as Endangered (A2d+3d+4d) on The IUCN Red List of Threatened Species™ in 2014 on the basis of suspected population declines over a period of 21 years (three generations, generation length estimated at seven years). There is little quantitative information on the status of *M. culionensis*. However, it 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 (Lagrada et al., 2014). It is considered to be more abundant in the northern and central parts of Palawan Island and much rarer in the south (Schoppe and Cruz 2009). There are relatively recent (2012) estimates of densities of 0.05 individuals per km² in mixed forest/brush land (Lagrada 2012). It is also reportedly abundant on Dumarán Island (435km²). However, in the last few years, local hunters have reported that populations are declining as a result of hunting, and a 2012 study reported that increased effort is now needed to catch pangolins, potentially as a consequence of declining populations (Lagrada 2012).



Fig. 4. Distribution of *M. culionensis*. Source: Lagrada et al. (2014).

5.2 Status of African pangolins

Pangolins occur throughout much of sub-Saharan Africa. Three species (*M. tetradactyla*, *M. tricuspis* and *M. gigantea*) occur in west and central Africa, while the fourth (*M. temminckii*) ranges across much of east and southern Africa and parts of central Africa. Together, the four species occur in at least 31 countries: Angola (Angola, Cabinda); Benin; Botswana; Cameroon; Central African Republic; Chad; Congo; Côte d'Ivoire; Democratic Republic of the Congo (DRC); Equatorial Guinea; Ethiopia; Gabon; Ghana; Guinea; Guinea-Bissau; Kenya; Liberia; Malawi; Mozambique; Namibia; Nigeria; Rwanda; Senegal; Sierra Leone; South Africa; South Sudan; Togo; Uganda; United Republic of Tanzania; Zambia; and Zimbabwe. African pangolins also possibly occur in Burkina Faso, Burundi and Niger. Less information is available about the status of African pangolins compared to the Asian species and as such information below is presented by species only as opposed to by species and by country as in section 5.1.

Twenty range States responded to the 2015/2017 questionnaires on the conservation status of one or more species of African pangolins: Angola (*M. tricuspis*), Benin (*M. tricuspis*), Botswana (*M. temminckii*), Cameroon (*M. tetradactyla*, *M. tricuspis* and *M. gigantea*), Chad (*M. temminckii*), Côte d'Ivoire (*M. tetradactyla*, *M. tricuspis* and *M. gigantea*), Gabon (*M. tetradactyla*, *M. tricuspis*, *M. gigantea*), Ghana (*M. tetradactyla*, *M. tricuspis*, *M. gigantea*), Kenya (*M. tricuspis*, *M. gigantea* and *M. temminckii*), Liberia (*M. tetradactyla*, *M. tricuspis*, *M. gigantea*), Namibia (*M. temminckii*), Nigeria (*M. tetradactyla*, *M. tricuspis*), South Africa (*M. temminckii*), Togo (*M. tricuspis*), Uganda (*M. tricuspis*, *M. gigantea* and *M. temminckii*), United Republic of Tanzania (*M. tricuspis*, *M. gigantea* and *M. temminckii*), Zambia (*M. tricuspis* and *M. temminckii*) and Zimbabwe (*M. temminckii*). Central African Republic and Senegal both reported being a range State for all four African pangolin species. However, to the knowledge of the authors, there are no confirmed records of *M. tetradactyla* from Senegal.

The majority of African range States that responded consider their pangolin population to be data deficient or in decline. The status of pangolins was reported to be data deficient in Angola, Benin, Botswana, Cameroon, Central African Republic, Chad, Gabon, Ghana, Kenya, Namibia, Senegal, Togo, Uganda, United Republic of Tanzania, Zambia and Zimbabwe, with Benin and Cameroon adding that populations are likely in decline. Côte d'Ivoire, Liberia and Nigeria reported population declines, based on levels of utilisation and trade. South Africa also reported population declines. Nigeria reported that *M. gigantea* has been extirpated in all protected areas, while *M. tricuspis* and *M. tetradactyla* are seen in protected areas in the south-west, south-east and south of the country.

South Africa reported in 2015 that moderate illegal trade is occurring in the country, although the extent of this trade is difficult to monitor and quantify. It is further unknown whether these specimens are

being sourced from live wild individuals or from road or electric fence mortalities, though it is suspected that animals are obtained from all three of these sources.

In its response to the 2015 questionnaire, Uganda reported records of *M. temminckii* and *M. gigantea* in the Ayago area of Murchison Falls National Park, near the location of a proposed hydroelectric power station. If confirmed, these records represent a possible range extension for *M. gigantea*. Similarly, Uganda reported that habitat loss (due to agriculture, human settlements and industrial developments) outside of protected areas is a potential threat to pangolins, along with increased poaching pressure for their scales. It also noted that pangolin scales 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 significant trade.

There is little information on the impact of legal and illegal trade on wild pangolin populations elsewhere in Africa. The Central African Republic reported that pangolins are often poached for their meat but that international trade in pangolins and their by-products has not yet developed. Liberia reported increasing levels of trade, but provided no data on the impact that this is having on populations or further details. 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. However, cases of illegal possession of pangolins in the country over the past year have been minimal.

5.2.1 Information from other sources

Far less information is available on African pangolins than for their Asian counterparts. However, in Africa, pangolins have long been hunted and poached for bushmeat and use in traditional African bush medicine ('muti' or 'juju'), rituals and magic in the majority of range States (e.g. Boakye et al., 2015; 2016a, b, Soewu and Sodeinde 2015). Ingram et al., (2017) estimate that 0.4-2.7 million pangolins are hunted annually in Central African forests. The number of pangolins hunted has increased by 150% and the proportion of pangolins of all vertebrates hunted increased from 0.04% to 1.83% between 1975 and 2014. However, there were no trends in pangolins observed at markets, suggesting use of alternative supply chains. On average, 45% of individuals were reported to be juveniles or sub-adults, suggesting that the hunting of Central African pangolins is potentially unsustainable (Ingram et al., 2017). 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., 2017).

There is a growing illegal intercontinental trade involving African pangolins and their derivatives, primarily their scales, to supply demand in East and South-east Asia (Challender and Hywood 2012; Gomez et al., 2016; see section 6.2.6). Habitat loss and/or degradation is also a threat to all four African pangolin species (Pietersen et al., 2014a; Waterman et al., 2014a, b, c). 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). Finally, electrocution from electric fences is a significant threat to *M. temminckii* in South Africa (Pietersen et al., 2014a).

5.2.1.1 *Manis tricuspis*

Manis tricuspis ranges from Guinea-Bissau in West Africa through Guinea, Sierra Leone and much of West Africa to Central Africa as far east as south-western Kenya and north-western Tanzania (United Republic of; west of Lake Tanganyika) and as far south as north-western Zambia and northern Angola; and also on Bioko (Fig. 5; Kingdon and Hoffmann 2013). There are no confirmed records from Senegal or the Gambia (Grubb et al., 1998). The species occurs in Uganda and in the United Republic of Tanzania close to the Uganda border. It was assessed as Vulnerable (A4d) at the global level on The IUCN Red List of Threatened Species™ in 2014, on the basis of estimated population declines of at least 40% over a 21 year period (seven years past, 14 years future; generation length estimated at seven years).



Fig. 5. Distribution of *M. tricuspis*. Source: Waterman et al. (2014a).

Manis tricuspis is the most common of the African forest pangolins, reaching relatively high densities in suitable habitat (Kingdon and Hoffmann 2013). It is regarded as the most common of the three pangolin species found in Nigeria (Angelici et al., 1999) and Gabon (Pagès 1975), and one study in Lama Forest Reserve (South Benin) recorded 38 *M. tricuspis* at a density of 0.84/km² during the dry season in both plantations and natural forest (Akpona et al., 2008). It is also by far the most abundant pangolin species found for sale in bushmeat markets (Bräutigam et al., 1994). For example, the species was the fourth most harvested species across 47 sites sampled during six months' fieldwork in Cameroon in 2002-2003 (Fa et al., 2006). Likewise, in a study in Equatorial Guinea around the village of Sendje (including within Mount Alén National Park), *M. tricuspis* was the fifth most common mammal species in terms of offtake (Kümpel 2006).

Boakye et al. (2016a) 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. The study 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 the availability of more prey (see also Lindsey et al., 2013; Fa et al., 2006; Schulte-Herbrüggen et al., 2013).

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 (Waterman et al., 2014a).

M. tricuspis is listed as Data Deficient and in decline in Benin (Sinsin and Hessou 2004). The species is believed to be declining in Ghana and Guinea, and close to extinction in Rwanda (Bräutigam et al., 1994). In Southwest Nigeria, hunters' reports and evidence of forest destruction suggest that the species is becoming rare (Sodeinde and Adedipe 1994).

In Uganda *M. tricuspis* is thought to be declining rapidly due to being targeted for bushmeat and international trade in animal parts (Kityo et al., 2016). It was assessed as Endangered nationally in Uganda in 2016, using the IUCN Red List Categories and Criteria (Kityo et al., 2016).

This species is considered rare in the United Republic of Tanzania, which is on the very edge of its range. In recent research efforts, pangolins were encountered on 2 out of 1,500 camera trap nights in Minziro Forest, the United Republic of Tanzania (Tim Davenport, *in litt.* to the authors, 2017).

5.2.1.2 *Manis tetradactyla*

Manis tetradactyla occurs in the forested regions of West and Central Africa from Sierra Leone eastwards through south-eastern Guinea, Liberia, Côte d'Ivoire and southwest Ghana, and then with an apparent gap in distribution until west Nigeria (Fig. 6). Its presence in Nigeria is probably underestimated because of possible confusion with *M. tricuspis* (Angelici et al., 1999; Kingdon and Hoffmann 2013). The species also occurs eastwards through southern Cameroon, and much of the Congo Basin forest block to the Semliki valley and marginally in Uganda, where it is known from only Semuliki National Park (Kityo et al., 2016). Its presence in Cabinda (Angola) is possible (Kingdon and Hoffmann 2013).



Fig. 6. Distribution of *M. tetradactyla*. Source: Waterman et al. (2014b).

This species was assessed as Vulnerable (A4d) at the global level in 2014 on The IUCN Red List of Threatened Species™ on the basis that it is projected to undergo a population decline of at least 30-40%

over a 21 year period (seven years past, 14 years future; generation length estimated at seven years) due to reported increases in the frequency with which it occurs in local, domestic trade and in intercontinental trafficking of it scales to Asian markets.

There are no quantitative data available on densities or abundance (Waterman et al., 2014b). This is the least frequently recorded of all African pangolin species, possibly reflecting its occurrence in little-penetrated habitats and/or reflecting its rare nature and low densities. It is exploited for bushmeat and for use in traditional African medicine, and is also traded and trafficked internationally. Boakye et al. (2016a) 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. *Manis tetradactyla* was assessed as Endangered nationally in Uganda in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).

5.2.1.3 *Manis gigantea*

Manis gigantea is discontinuously distributed in humid forests in West and Central Africa. It is recorded from Senegal (though there is no evidence of its presence in the Gambia) eastwards through Guinea, Sierra Leone, Liberia, Côte d'Ivoire and Ghana. Its presence in Benin, Burkina Faso, Niger and Togo is uncertain (Fig. 7). The occurrence of this species in Nigeria is unclear, but its presence in the southeast has been confirmed by a recent record from Gashaka-Gumti National Park (S. Nixon unpubl. data). 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).

From Cameroon *M. gigantea* is fairly continuously distributed throughout the Congo Basin to Uganda (Kingdon et al., 2013). It has been observed on the lakeshore in west Kenya, close to the Uganda border and there is an authenticated record from the Mahale Mountain in western United Republic of Tanzania, where their presence has been confirmed by camera-traps (Kingdon et al., 2013). The species' presence has been similarly confirmed in southwest South Sudan, near the DRC border (D. Reeder, unpubl. data).

There are no records from Burundi (Kingdon et al., 2013), and the species was believed extinct in Rwanda (Bräutigam et al., 1994) until recent camera trap information confirmed its presence in the east of the country (D. Bantlin unpubl. data). The northern limits of its distribution are not well known but can be expected to broadly coincide with those of the tropical lowland rainforest. The northern banks of the Kasai and Tshuapa Rivers apparently define its southern limits within the central forest block (Kingdon et al., 2013).



Fig. 7. Distribution of *M. gigantea*. Source: Waterman et al. (2014c).

This species was assessed as Vulnerable (A4d) at the global level in 2014 on The IUCN Red List of Threatened Species™ on the basis that it is reasonable to assume that populations have already begun declining and will continue to decline by at least 40% over a 27 year period (nine years past, 18 years future; generation length estimated at 9 years) (Waterman et al., 2014c). This is due to the impact of bushmeat hunting and the recent emergence of industrial level trafficking of tropical African pangolin scales to East Asian markets (see section 6.2).

Very limited information is available on the status of the species nationally. However, in Uganda 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/km² (Anon. 2016a). Bräutigam et al. (1994) reported that the species is believed to be quite rare, declining throughout its range. The species has been recorded from Itwara and Kibego Matiiri Forest Reserves in Uganda but their low relative abundance suggests that they are not fairing 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 good populations within protected areas. *Manis gigantea* was assessed as Endangered nationally in Uganda in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).

In the United Republic of Tanzania the species has been recorded only from Mahale and Minziro National Parks. 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).

Bräutigam et al. (1994) reported that *M. gigantea* is believed to be quite rare, declining throughout its range, and reported it extinct in Niger.

5.2.1.4 *Manis temminckii*

Manis temminckii is the most widespread African pangolin species, having been recorded from south eastern Chad, through Sudan and South Sudan, across much of East Africa and southern Africa as far south as South Africa (Fig. 8). In southern Africa the species is widely distributed, although now largely confined to protected areas and well-managed livestock and wildlife farms (Pietersen et al., 2016). The northern limits of its distribution are not well defined, although the species has been recorded from extreme northeast Central African Republic, south eastern Chad, South Sudan and southwest Ethiopia (Swart 2013) (Fig. 7; Pietersen et al., 2014b).



Fig. 8. Distribution of *M. temminckii*. Source: Pietersen et al. (2014b).

The species was assessed as Vulnerable (A4d) at the global level in 2014 on The IUCN Red List of Threatened Species™ based on inferred past/ongoing and projected future population declines of 30-40% over a 27 year period (nine years past, 18 years future; generation length estimated at nine years). This is attributed primarily to ongoing exploitation for traditional medicines and bushmeat across its range, and increased intercontinental trade to Asia (Pietersen 2014b).

Little is known about the abundance of this species across most of its range, though one exception is South Africa. Here, the total density in the Kruger National Park region has been estimated at 0.24/km², which compares with estimates in Zimbabwe of at 0.11/km² (Swart 2013; Pietersen et al., 2014b). A more recent study in Northern Cape Province, South Africa, estimated total density as 0.23–0.31/ km² (Pietersen et al., 2014a). The species is also severely threatened by electrified fences within South Africa with an estimated 377–1,028 individuals electrocuted per year. It is also threatened by 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), and an estimated 280 animals are killed per year in road collisions. Incidental mortalities in gin traps are also reported (Pietersen et al., 2016). 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). Pietersen et al. (2016) estimate the total mature population size in South Africa to range between 7,002 and 32,135 individuals, with a most likely estimate of 16,329–24,102 individuals. Pietersen et al. (2016) also assert that the southern African population of *M. temminckii* likely acts as a source population for many of the 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. The species was assessed as Vulnerable in southern Africa (South Africa, Swaziland and Lesotho) in 2016 (Pietersen et al., 2016).

In Uganda, the species occurs in Murchison Falls National Park and Kidepo Valley National Park, where it very likely only survives in good populations within protected areas (Kityo et al., 2016). *Manis temminckii* was assessed as Vulnerable nationally in Uganda in 2016 using the IUCN Red List Categories and Criteria (Kityo et al., 2016).

This species is widespread in the United Republic of Tanzania but is rare and occurs at higher densities in protected areas (Tim Davenport, *in litt.* to the authors, 2017).

6. Legal and illegal trade in pangolins

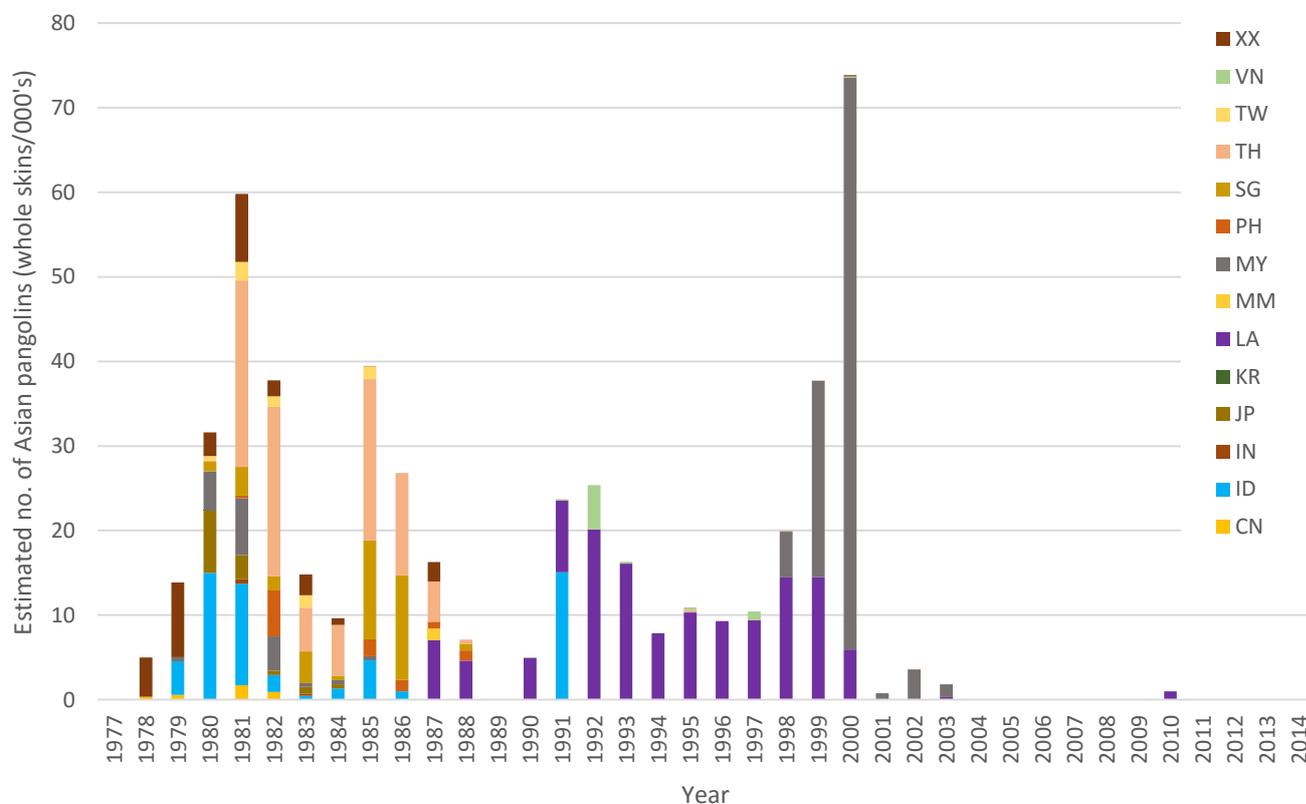
6.1 Legal trade

CITES trade data for pangolins were downloaded on 18th May 2017 in the form of a comparative tabulation report and analysed to inform this report. Data were downloaded covering the period 1975-2016, including all exporting and importing countries, all sources, purposes and trade terms and by searching for the genus *Manis*. The latest year for which data were available was 2015.

6.1.1 Asian pangolins

International trade in pangolins as reported to CITES has primarily involved the Asian species. It has also largely comprised trade in skins. Trade in whole skins of Asian pangolins amounted to an estimated 509,564 skins which took place between 1977 and 2014 (Fig. 9). This trade involved skins originating from or being exported from across Asia and specifically from 12 of the 19 Asian pangolin range States (China, Hong Kong SAR, India, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Taiwan Province of China, Thailand and Viet Nam) (Fig. 9).

Fig. 9. Estimated number of whole skins of Asian pangolins in international trade between 1977 and 2014 as reported by importers by country of origin (or exporters if origin not reported).*



*Includes '*Manis* spp.' where originating in or exported from Asian pangolin range States. The last year for which trade in whole skins of Asian pangolins was reported is 2014.

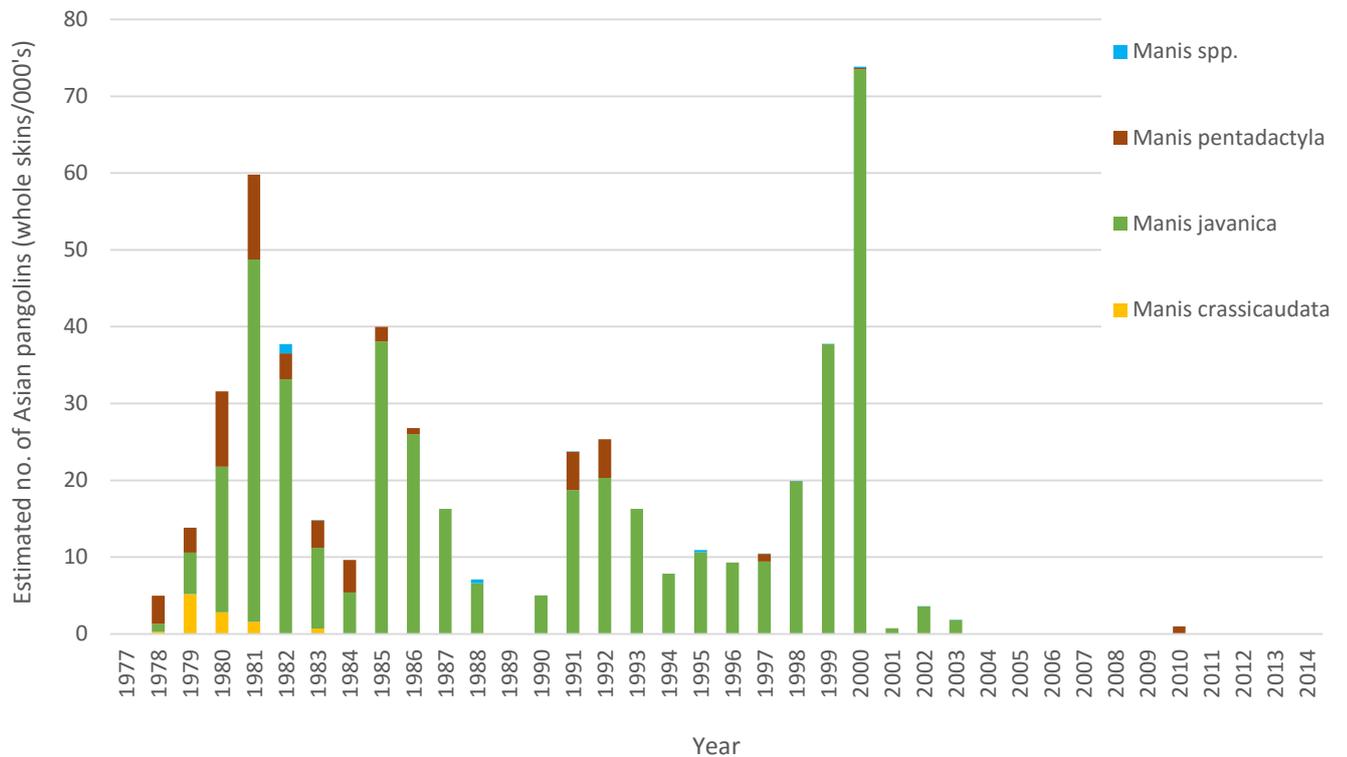
Over the 38 year period 1977-2014, this trade involved approximately 13,500 whole skins per year. However, virtually all of this trade (99%, 502,383/509,564 whole skins) occurred prior to, or in, the year 2000 (Fig. 9). At the 11th meeting of the Conference of the Parties (CoP11, Kenya, 2000), the Parties established zero export quotas for wild-caught Asian pangolins traded for primarily commercial purposes. Focusing on trade between 1977 and 2000 adjusts trade volumes to a mean of approximately 21,000 whole skins per year in that time period.

The source of this trade appears to have shifted over time. Major exporters by volume at the end of the 1970s and in the 1980s were Indonesia and Thailand, but this shifted to Lao PDR in the 1990s (which was not a Party to the Convention at the time), and to Malaysia in the late 1990s (1998-2000) (Fig. 9). Much of this trade was imported to the United States, Mexico, Japan and Singapore, with high levels of re-exports from Japan and Singapore to the United States and Mexico. Most of the trade in whole skins (93%, 474,846/509,564 whole skins) took place for commercial purposes (purpose code 'T'), of which 33% (166,123/509,564 whole skins) was reported as sourced from the wild (source code 'W'). Source codes were largely absent for the remainder of trade reported as commercial in nature.

The majority of trade in whole skins of Asian pangolins involved *M. javanica*, which accounted for 87% of this trade (442,966/509,564 whole skins) (Fig. 10). There was far less trade involving *M. pentadactyla* (11%, 53,874/509,564 whole skins), *M. crassicaudata* (2%, 10,555/509,566 whole skins) or unidentified Asian pangolins (*Manis* spp., <1%) (Fig. 10). *Manis culionensis* was only recently described as distinct from *M. javanica* (see Gaubert & Antunes 2005) and *Manis culionensis* therefore doesn't appear in these trade figures. However, assuming reported origins of whole skins in trade are accurate, trade involving *M. javanica* from the Philippines amounted to approximately 10,000 skins that either originated in, or were exported from the Philippines in the period 1981-1989 (Fig. 9).

Since 2000, there has been comparatively little reported trade in whole skins which amounts to an estimated 7,181 skins (Fig. 9, Fig. 10) or other derivatives (Table 1). There has also been little reported illegal trade in skins (see section 6.2). The majority of reported trade in whole skins (85%, 6132/7181 skins) again involved *M. javanica* and reportedly originated in Malaysia and was exported from Japan to Mexico between 2001 and 2003. Trade since 2000 also includes the import of 1000 *M. pentadactyla* skins to Mexico from Lao PDR in 2010 which were declared as ranches (source code 'R'). However, this source code seems questionable based on known difficulties of rearing and maintaining pangolins in captivity (e.g., Hua et al., 2015) and determining that this number of animals in the wild would have a very low probability of survival to adulthood as required in Resolution Conf. 11.16 (Rev. CoP15).

Fig. 10. Estimated number of whole skins of Asian pangolins in international trade between 1977 and 2014 as reported by importers by species.*



*Includes 'Manis spp.' where originating in or exported from Asian pangolin range States.

The other main derivative of Asian pangolins in trade by volume of animals, and where derivatives can be unambiguously converted into a number of animals is scales (by weight). To estimate the number of Asian pangolins in trade from quantities of scales we followed methods published in the scientific literature (see Annex 1). Trade in scales involved an estimated 53,052 Asian pangolins, which took place between 1994 and 2012. This comprised an estimated 18,280 kg of scales (as reported by importers) comprising *M. javanica* and equating to an estimated 50,707 animals, 99% of which originated from or were exported from Malaysia and Singapore and imported to China, Hong Kong SAR and Singapore. All of this trade involved wild-caught animals traded for commercial purposes. A high proportion of this trade took place before the year 2000, but 1800 kg of scales sourced from the wild (equating to an estimated 4993 animals) that originated from Malaysia, were exported from Singapore to China between 2010 and 2012 and were traded for commercial purposes. Correspondence with the Singapore CITES Management Authority indicates that these were stocks acquired before the year 2000. Small volumes of scales, ranging from 29-2,045 gm (2.73 kg in total equivalent to an estimated eight pangolins) were also seized in the United States between 2001 and 2004 having been exported from China and Lao PDR. Trade in scales of the other Asian pangolin species involved the export of 500 kg of *M. pentadactyla* scales (equivalent to an estimated 872 animals) from China to the United States in 1997, which were wild-caught and traded for commercial purposes, and 0.4 kg of *M.*

pentadactyla scales seized in the United States in 2009 having been exported from Viet Nam and traded for personal purposes.

Trade in scales of *Manis* spp. originating in or being exported from Asian pangolin range States (as reported by importers) involved 529.5 kg of scales, or an estimated 1,469 animals. The vast majority of these scales (500 kg or an estimated 1387 pangolins) originated in Malaysia and were exported from Singapore to China in 2010. They were sourced from the wild and traded for commercial purposes. Small volumes or numbers of scales (e.g., <1 kg or less than ten individual scales) of *Manis* spp. were also seized in the United States between 2002 and 2014 having been exported from Hong Kong SAR and Thailand.

Beyond whole skins and scales, international trade in Asian pangolins has involved various other derivatives (Table 1), but it is not possible to unambiguously convert these derivatives to numbers of animals. However, like for skins and scales, trade primarily involved *M. javanica* and to a lesser degree *M. pentadactyla*, with little trade reported involving *M. crassicaudata* and *M. culionensis* (Table 1). Trade in leather items involving *M. javanica* amounted to an estimated 2,388 items (based on importer quantities) which were primarily imported to the United States (99%) from Japan, Lao PDR and Mexico between 1982 and 1998, having originated in Indonesia, Lao PDR, Malaysia and Thailand. Trade in live animals totalled 1265 pangolins, and primarily occurred between 1980 and 1989, during which period 694 animals were imported to the United States (most of which originated in Indonesia), and 537 animals that were imported to Japan from the Philippines. Hong Kong SAR imported eleven live animals in 2013 for scientific purposes but they were reportedly seized (source code 'I'). Trade in *M. javanica* also involved 9215 units of shoes, all of which were traded between 1977 and 2001 and 95% of which (8716) were imported to the United States.

Trade in other derivatives of *M. pentadactyla* largely comprised derivatives, as well as medicines, and live animals (Table 1). Trade in derivatives included 24,940 units between 1985 and 2011, which were exported post-2000 from China, Hong Kong SAR, Indonesia, Lao PDR, and Viet Nam and confiscated in the United States (source code 'I'), the majority of which were traded for personal purposes (also see section 6.2). China also reported exports of 30,000 units of derivatives to Hong Kong SAR in 1992 that were wild-caught and traded for commercial purposes. Trade also involved cartons of derivatives that numbered 5208 which were exported from China between 1990 and 1992 to Hong Kong SAR (2638 cartons), Malaysia (1276 cartons), Macau (713 cartons), and Singapore (410 cartons). Trade also included over 500 kg of derivatives that were predominantly exported from China to the United States in 1998 that were wild-caught and traded for commercial purposes.

Table 1. Trade in other derivative products of Asian pangolins and *Manis* spp. originating in or exported from range States between 1977 and 2015 as reported by importers.

Species/derivative	1977-1989	1990-1999	2000-2015
<i>M. javanica</i>			
Bodies	2	21	7
Derivatives			2
Leather items	1330	1058	
Leather products (large)		14	41
Leather products (small)	17	872	1324
Leather products (small – pairs)		1	8
Live	1225		
Meat`	1		
Meat (kg)	45.36		
Shoes	3815.36	3711	1689
Skin pieces (kg)		73.55	
Skin pieces (m)	184		
Specimens (ml)			3150.3
Specimens			62
<i>M. pentadactyla</i>			
Bodies	2	9	1
Carvings			1
Derivatives*	480	245	24215
Derivatives (cartons)	5208		
Derivatives (kg)		507	1
Derivatives (g)			690
Leather items	373		
Leather products (small)	50		
Live	16	18	6
Meat (kg)		1	
Medicine			277
Medicine (g)			12909
Shoes	1529	744.5	
Skin pieces	240		
Skin pieces (m)	50		
Skin pieces (kg)	94.35		
Specimens			178
Specimens (kg)			14
<i>M. crassicaudata</i>			
Leather products (small)	1		
Shoes	3		
Specimens			7
Specimens (ml)			1
<i>M. culionensis</i>**			
Specimens			19
<i>Manis</i> spp.			
Bodies	1	14	2
Claws		2	1
Derivatives	1	19	3368
Derivatives (g)		454	210
Derivatives (kg)		22	3
Feet		9	2
Leather items	330	197	
Leather products (large)			2
Leather products (small)	4		1
Live		100	
Meat (kg)		2	2.65
Medicine			928
Powder			14
Shoes	46		
Skins pieces			29
Specimens		422	143
Tails			3
Unspecified		27	s. 1
Unspecified (kg)		3.49	0.7

*China reported exporting 30,000 units to Hong Kong SAR in 1992. **Based on exporter reported quantities.

Trade in medicines involved exports from Viet Nam (261 units) and China (16 units) which were seized in the United States between 2012 and 2015, having been traded for personal or commercial purposes. Trade also involved approximately 12 kg of medicines from China and Viet Nam that were similarly seized in the United States in 2012-2014. Trade in live animals totalled 40 individuals, 29 of which were exported from China between 1977 and 2004 and imported to Australia, Japan and the United States. Most of this trade (34/40 animals based on exporter reported quantities) also occurred pre-2000. Post-2000, six animals were exported from Taiwan Province of China to Germany (two in 1997, one in 2007 and one in 2009, the latter two both for zoological or educational purposes) and Japan (two in 2012 both reported as seized (source code 'I')). Four animals that reportedly originated from mainland China were exported from Hong Kong SAR to the United States in 1984.

A total of 19 specimens of *M. culionensis* were in trade between 2007 and 2015 based on exporter reported quantities, all of which were traded for scientific purposes (source code 'S'). All specimens originated in or were reportedly exported from the Philippines. Seven specimens were imported to the United States, two were imported to Canada and two to China, and eight were reportedly imported to France in 2014 and 2015, though France confirmed with the authors that it did not deliver any import permits for *M. culionensis* for either 2014 or 2015.

6.1.2 African pangolins

There has been little reported trade in African pangolins compared to the Asian species between 1975 and 2015. Reported trade involved all four African species and primarily involved live pangolins and scales. However, there are notable differences in the reported quantities of animals in trade between importers and exporters as detailed below.

Most trade in live pangolins involved *M. tricuspis*. As reported by importers this involved 772 animals between 1985 and 2015. The majority of this trade is accounted for by the reported import into Italy of 500 animals from Togo in 2008 for commercial purposes and which were reportedly ranched (source code 'R') (Fig. 11). However, this source code seems questionable based on known difficulties of rearing and maintaining pangolins in captivity (e.g., Hua et al., 2015) and determining that this number of animals in the wild would have a very low probability of survival to adulthood as per Res. Conf. 11.16 (Rev. CoP15). A further 200 wild-caught *M. tricuspis* were reportedly exported from Nigeria to China in 2015 for the purpose of captive-breeding (source code 'B') (Fig. 11) (see section 10). Other notable trade includes the import into the United States of 15 animals in 1986 from Togo for commercial purposes, ten animals imported into the United States in 2007 from Cameroon for commercial purposes (but which were seized), and import into the United States of 17 live *M. tricuspis* in 2015 which were

Figure 11 (a). Number of live African pangolins in international trade between 1975 and 2015 by species as reported by importers

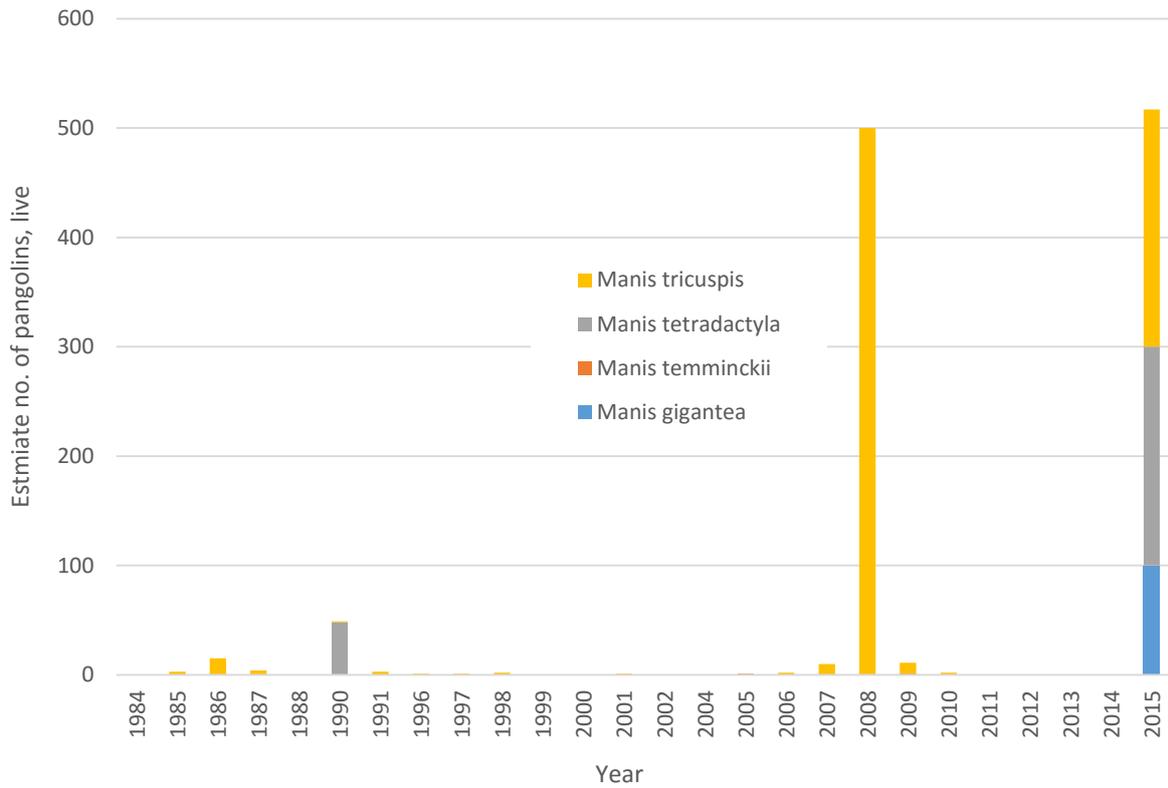
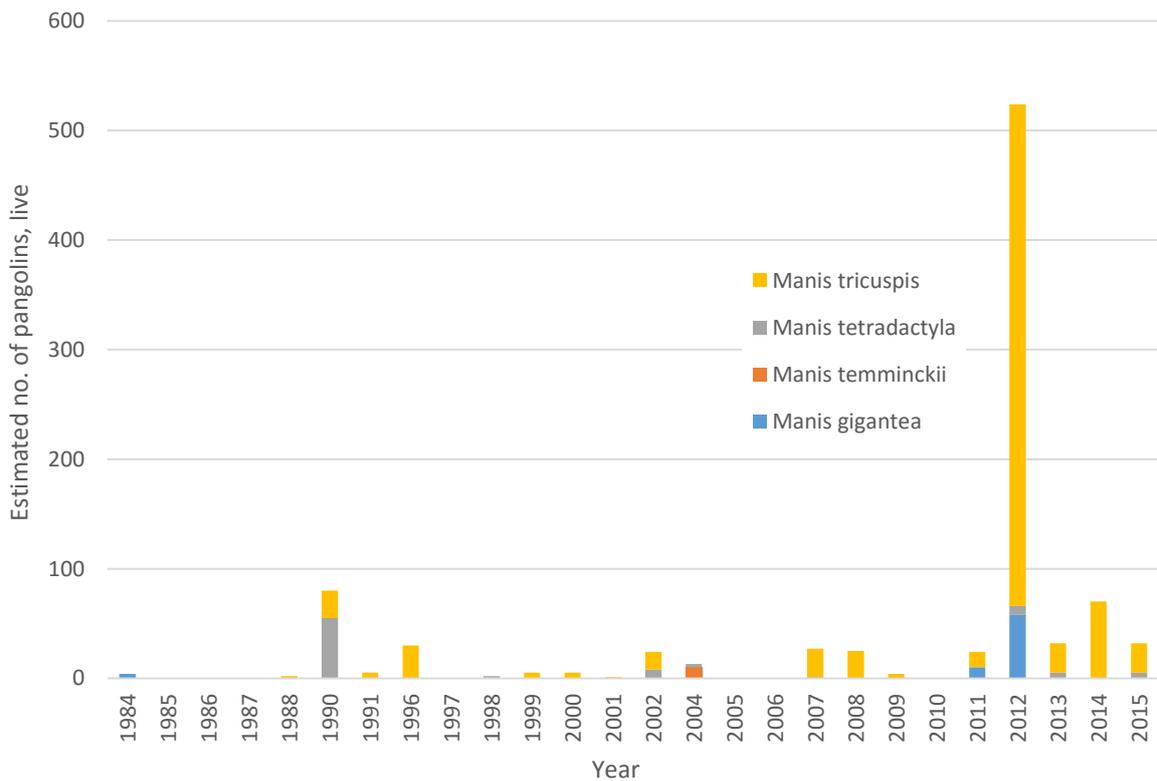


Figure 11 (b). Number of live African pangolins in international trade between 1975 and 2015 by species as reported by exporters



wild-caught and traded for commercial purposes (see section 10). The Republic of Korea also reported the import of ten animals from Nigeria in 2009 that were wild caught and traded for zoological purposes.

Exporters reported similar trade volumes; a reported 740 live *M. tricuspis*, but with different trade dynamics. The majority of trade reported by exporters comprised the export in 2012 of 250 live animals from Togo to Lao PDR and 200 live animals from Togo to Viet Nam, all of which were reportedly wild-caught and traded for commercial purposes (Fig. 11) (also see section 10). Other reported trade included exports from Togo of 90 live *M. tricuspis* to the United States between 1996 and 2015 (ten animals in 1996, 16 in 2002, eight in 2013, 34 in 2014 and 22 in 2015). However, the United States has confirmed that between 1985 and 2015 it only imported 53 live *M. tricuspis*, and only 17 animals between 2013 and 2015. Similarly, based on exporter reported quantities, 85 live *M. tricuspis* were exported from Togo to Japan between 1990 and 2015 all for commercial purposes, 60 of which were wild-caught. Between 2007 and 2014 Togo reported the export of 89 live *M. tricuspis*, all of which were wild-caught and traded for commercial purposes, to the following destinations: Spain (22 animals, 2011-2013), Tonga (20 animals, 2008), Italy (15 animals, 2007), China (ten animals, 2014), Oman (ten animals, 2014), Malaysia (six animals, 2014), and Japan (three animals, 2012). Cameroon reported exporting ten live animals to the Czech Republic in 2007 and four live animals to Japan in 2009, all wild-caught and traded for commercial purposes.

Dynamics of trade involving live *M. tetradactyla* also differ by importer and exporter reported quantities. Based on importer reported quantities 248 live animals were traded between 1990 and 2015. This comprised the import of 200 live, wild-caught *M. tetradactyla* to China from Nigeria in 2015 for the purposes of captive-breeding (source code 'B') (Fig. 11) (see section 10). It otherwise involved imports into the United States of 48 animals in 1990, 13 of which were wild-caught, 35 of which had an unknown source, and all of which were for commercial purposes. Based on exporter reported quantities trade between 1990 and 2015 involved 87 animals, 55 of which were exported from Togo to the United States in 1990 for commercial purposes. Exports otherwise involved between one and eight animals exported from Togo to the Netherlands, Spain, Japan, Czech Republic and the United States between 2002 and 2015, all of which were wild-caught and traded for commercial purposes. The United States has confirmed that it only imported 48 live *M. tetradactyla* as importer statistics indicate. Benin reported the export of two live *M. tetradactyla* to Hungary in 1998.

Trade in live *M. gigantea* involved 100 animals based on importer reported quantities. This involved 100 animals imported in to China from Nigeria in 2015 which were wild-caught and traded for the purpose of captive-breeding (source code 'B') (Fig. 11). Based on exporter reported quantities, 50 live *M. gigantea* were imported in to Lao PDR from Togo in 2012 and which were wild-caught and traded for commercial purposes (Fig. 11). Other trade in live *M. gigantea* as reported by exporters included

the export of 22 animals from Togo between 1984 and 2012 to the United States (four animals, 1984), Japan (13 animals, 2011-2012) and Spain (five animals, 2012) all of which were traded for commercial purposes and source codes indicate most trade was in wild-caught animals. The United States has confirmed with the authors that's its records do not reflect any imports of live *M. gigantea*.

Trade in live specimens of *M. temminckii* involved up to 12 animals between 2004 and 2009. Based on importer reported quantities one animal was imported to the United States from DRC in 2005 that was wild caught and traded for personal purposes, and one wild-caught *M. temminckii* was imported to Georgia from the United Republic of Tanzania in 2009 for zoological purposes. Correspondence with the Georgian CITES authorities confirms that this animal was imported by Tbilisi zoo but died soon after import. Based on exporter reported quantities ten live, wild-caught *M. temminckii* were exported from the DRC to Italy in 2004 for commercial purposes. However, the known distribution of *M. temminckii* does not include the DRC (Kingdon et al., 2013) and it is possible that reported trade in this species from DRC could have involved *M. gigantea*.

Reported trade in African pangolin scales has occurred only since 2011. To convert the below quantities of scales into an estimated number of animals we used methods and conversion parameters presented in Annex 1. Trade in scales of *M. tricuspis* involved 2010 kg (an estimated 5576 animals) between 2013 and 2015 based on importer reported quantities that were wild-caught and traded for commercial purposes. This mainly comprised the import of 1950 kg of scales to China from the Congo (1000 kg in 2015) and DRC (950 kg in 2014-2015). It also involved the import of 60 kg of scales into Hong Kong SAR from Togo in 2013 (though Togo reports exports of only 30 kg). All this trade involved wild-caught scales traded for commercial purposes. Trade otherwise involved small quantities of scales traded between the Central African Republic and South Africa in 2015, and Liberia and Denmark for scientific purposes.

Reported trade in *M. gigantea* scales involved 3268.14 kg of scales (an estimated 908 animals) based on importer reported quantities. The majority of this trade is accounted for by the import to China of 3198 kg of scales from Uganda in 2014 (Uganda reported exports of 3211 kg). Otherwise it involved the import to Viet Nam of 70 kg of *M. gigantea* scales from Uganda in 2013. All this trade involved wild-caught scales traded for commercial purposes. Less than 0.2 kg of scales were seized in the UK in 2012 have been exported from Gabon. Based on exporter reported quantities, and excluding the reported exports from Uganda to China and Viet Nam above, trade in *M. gigantea* scales involved 464 kg scales. This comprised exports from Togo to Thailand (265 kg) and China (30 kg) between 2011 and 2013. It also involved exports of 169 kg of scales from Uganda to Viet Nam (70 kg in 2013) and Malaysia (99

kg in 2014) that were wild-caught and traded for commercial purposes. Trade otherwise involved exports of small volumes of scales from Togo to Thailand in 2011 and 2012.

Trade in other derivatives of African pangolins has involved, *inter alia*, bodies, skins, and specimens (Table 2). Trade in *Manis* spp. not originating in or exported from range States comprised: four bodies, two claws, 72 derivatives, one foot, 79 leather items, 64 leather items, 32 live (1981 [29], 1996 [3]), 2660 scales, 266 kg scales, 333 shoes, 14 skin pieces, 364 skins, and seven specimens (Table 2).

Table 2. Trade in other derivative products of African pangolins and *Manis* spp. originating in or being exported from African range States between 1977 and 2015 as reported by importers.

Species/derivative	1977-1989	1990-1999	2000-2014
<i>M. tricuspis</i>			
Bodies	5		2
Carvings			1
Skin pieces			255
Skins		2	408
Skulls			1
Specimens		1	159
Trophies	1	4	2
<i>M. tetradactyla</i>			
Bodies		2	1
Leather items	1		
Shoes	36		
Skeletons			10
Skins			11
Skulls			14
Specimens		1	104
<i>M. gigantea</i>			
Bodies		1	1
Derivatives			175
Leather products (small)			174
Skin pieces			63
Skins			535
Specimens			11
Trophies			2
<i>M. temminckii</i>			
Bodies	1		7
Carvings			1
Leather products (small)			1
Skeletons			1
Skin pieces			2
Specimens			23
Specimens (kg)			0.1
Trophies			1
<i>Manis</i> spp.			
Bodies			13
Carvings	15		1
Leather items		1	
Leather products (small)			1
Meat			7
Meat (kg)			2.8
Skins			7
Specimens			6

6.1.3 Legal trade not reported to CITES

Based on responses to Notification to the Parties No. 2017/035 only, the United States and Switzerland reported legal imports and/or exports that are not currently reflected in annual reports. The United States imported 46 live *M. tricuspis*, 14 in April 2016 and 32 in November 2016. All of these animals were wild-caught, and reportedly originated in and were exported from Togo, for zoological purposes (purpose code 'Z'). The United States also imported two wild-caught specimens from Singapore in 2016 for scientific purposes, one skin in 2016 from Liberia (wild-caught for personal purposes), and exported one skin piece in 2016 to Senegal for law enforcement purposes. Switzerland imported 0.88 kg of scales (*Manis* spp.) in March 2017 for the training sniffer dogs (purpose code 'E').

6.2 Illegal trade

Data on illegal trade in pangolins came from one of three sources: i) it was reported by Parties in response to Notification to the Parties No. 2017/035; ii) it was provided by Parties in response to Notification to the Parties No. 2014/059, or iii) it was provided by UNODC from their World WISE database (see Annex 1 for full details on methods). Data consisted of reports of seizures that took place in 40 countries: Belgium, Cambodia, Cameroon, China, Congo, Côte d'Ivoire, France, Gabon, Germany, Hong Kong SAR, India, Indonesia, Japan, Kenya, Lao PDR, Liberia, Malaysia, Malta, Myanmar, Namibia, the Netherlands, Nepal, New Zealand, Norway, Pakistan, the Philippines, Singapore, Spain, South Africa, Switzerland, Thailand, Togo, Uganda, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Viet Nam, Zambia and Zimbabwe. However, available information on illegal trade dynamics based on these data demonstrates that illegal pangolin trade involves, or at least implicates, 56 Parties (i.e. an additional 16 Parties implicated as alleged countries of origin, export, transit and/or destination) and takes place globally (Fig. 12). The additional Parties comprise: Benin, Central African Republic, DRC, Equatorial Guinea, Ethiopia, Ghana, Guinea, Italy, Lichtenstein, Mexico, Morocco, Nigeria, Qatar, Sierra Leone, Sudan, and Turkey.

Based on these datasets 1,557 seizures involving pangolins and/or their derivatives took place between 1999 and 2017 (Fig. 13). The majority of these seizures (94%) took place in 2006 or later and these analyses can therefore be considered an evaluation of pangolin trafficking in the last decade. This illegal trade involved an estimated 192,576 pangolins (Fig. 13) which far exceeds trade levels reported to CITES in this period (see section 6.1). It involved all eight species of pangolin but mainly involved '*Manis* spp.', owing to the fact that reports of seizures of pangolins and their derivatives infrequently report the species involved (i.e. beyond genus level) (Fig. 14). This appears to be related to a lack of capacity among enforcement personnel to correctly identify species and derivatives in trade (see section 7.7). Beyond seizures of *Manis* spp., *M. javanica* was the species most frequently seized between 1999

Fig. 12. Global overview of pangolin trafficking between 1999 and 2017 based on available data on seizures and trafficking dynamics. Trade flows represent estimated no. of pangolins.

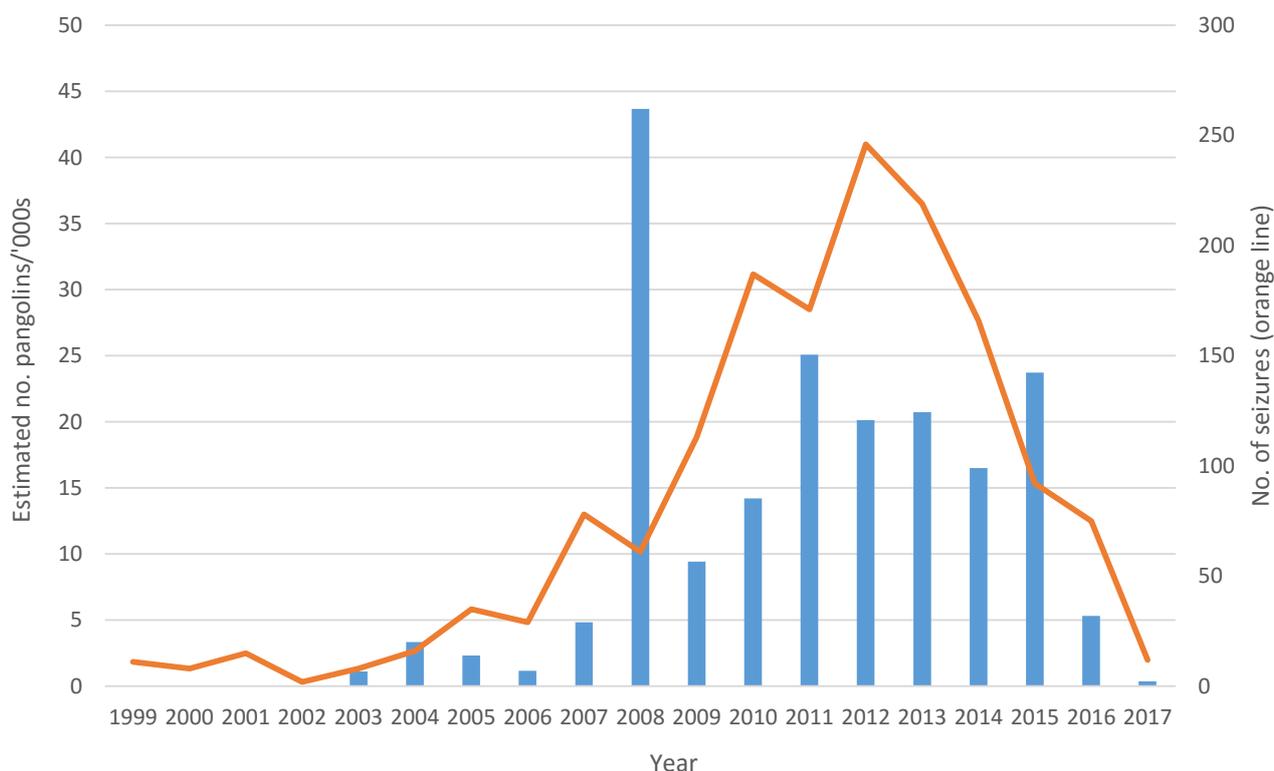
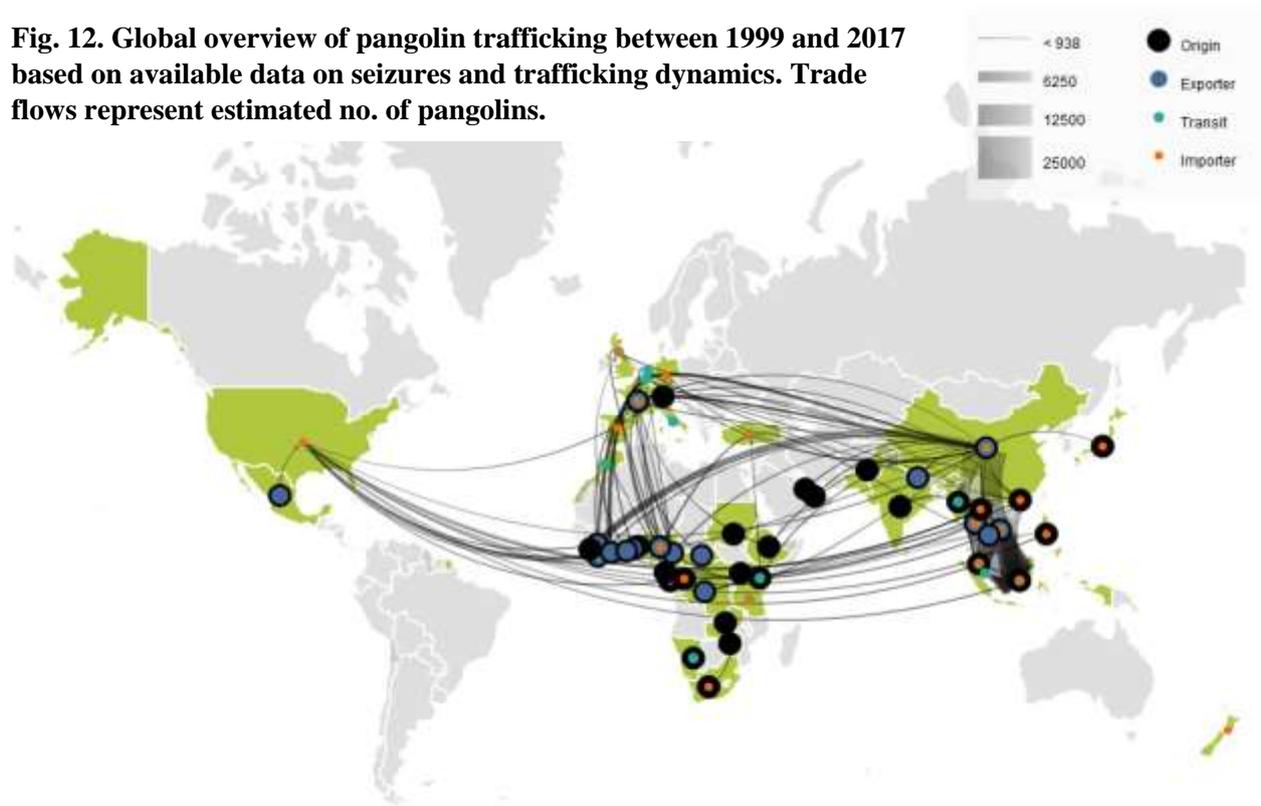


Fig. 13. Estimated no. of pangolins illegally traded between 1999 and 2017 and estimated no. of seizures involving pangolins and/or their derivatives between 1999 and 2017. N.B. It is likely consolidated datasets are not yet available for 2016. The same applies for 2017 as Parties were asked to respond to Notification to the Parties 2017/035 by 15 May 2017. Thirteen seizures involving the equivalent of 575 pangolins are not displayed as year of seizure was missing (5 in Kenya and 8 in Thailand).

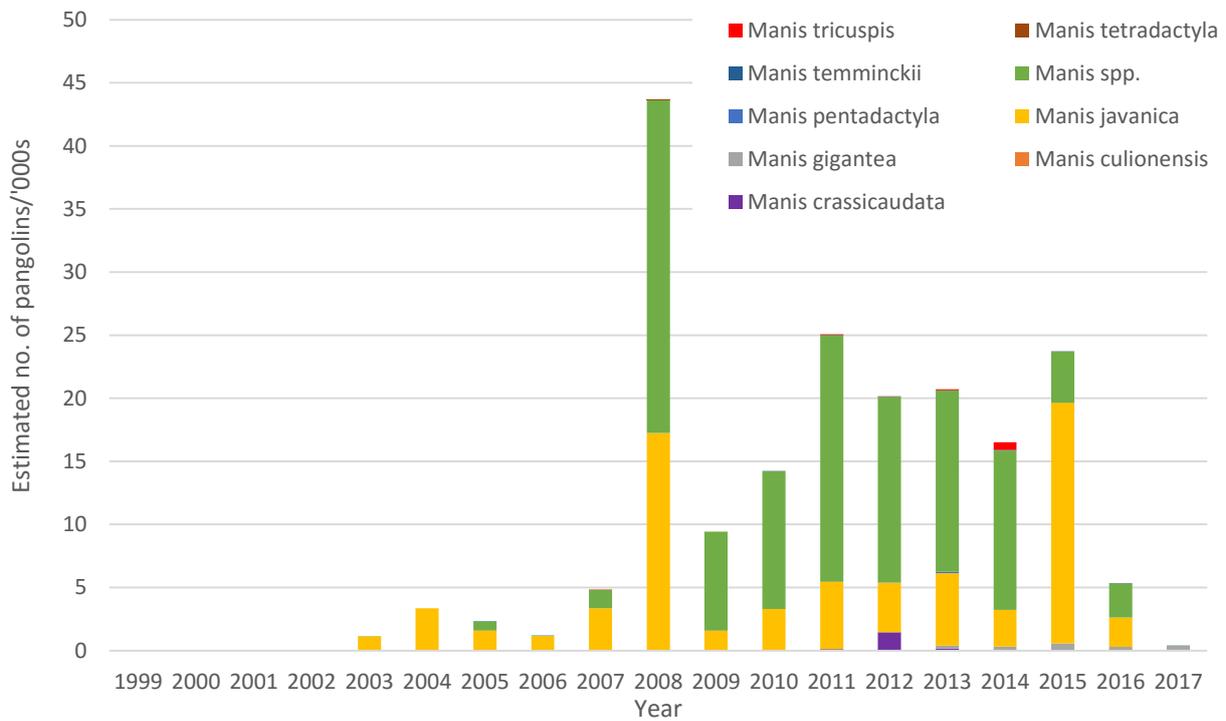


Fig. 14. Estimated no. of pangolins illegally traded between 1999 and 2017 by species. N.B. It is likely consolidated datasets are not yet available for 2016. The same applies for 2017 as Parties were asked to respond to the Parties 2017/035 by 15 May 2017. Thirteen seizures involving the equivalent of 575 pangolins are not displayed as year of seizure was missing (5 in Kenya and 8 in Thailand).

and 2017 based on trade volumes (Fig. 14), but it is evident from the dynamics described below that trafficking involved higher quantities of each species than these data indicate.

An increasing number of seizures took place between 2002 and 2012 (Fig. 13), when seizures peaked at 246, following which they declined to only 75 in 2016 and 12 in 2017. However, it is feasible that consolidated datasets are not yet available for 2016 (and obviously not for 2017), while UNODC Data did not extend beyond 2015, both of which may account for the low number of seizures in 2016. This is corroborated by data on seizures in 2016 (and 2017) from other sources (see section 7.2.6). Notably, declines in the number of seizures since 2012 did not result in fewer pangolins or their equivalent in derivative terms being seized, with an average of approximately 20,000 animals being seized in 2013, 2014 and 2015.

There is a notable peak in the estimated number of pangolins seized in 2008 (Fig. 13, Fig. 14). The bulk of illegal trade in that year can be attributed to two particularly large seizures in Viet Nam comprising 17,000 and 7,000 pangolins respectively which originated in Indonesia and would therefore involve *M. javanica* (though this is recorded by UNODC as *Manis* spp.), and one seizure in Indonesia involving 14,000 animals (*M. javanica*). This peak has also been detected in similar analyses quantifying

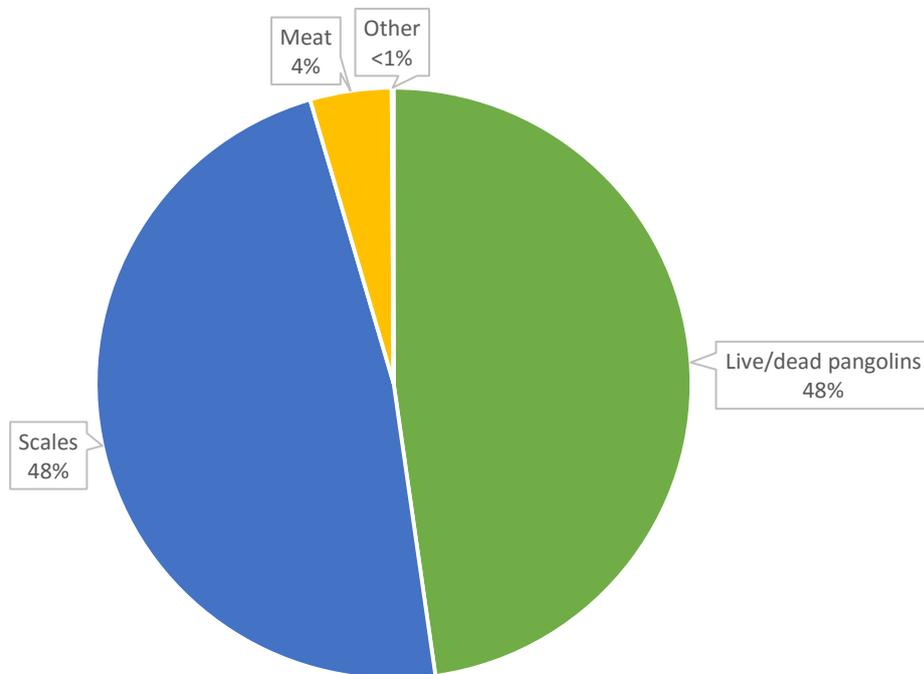


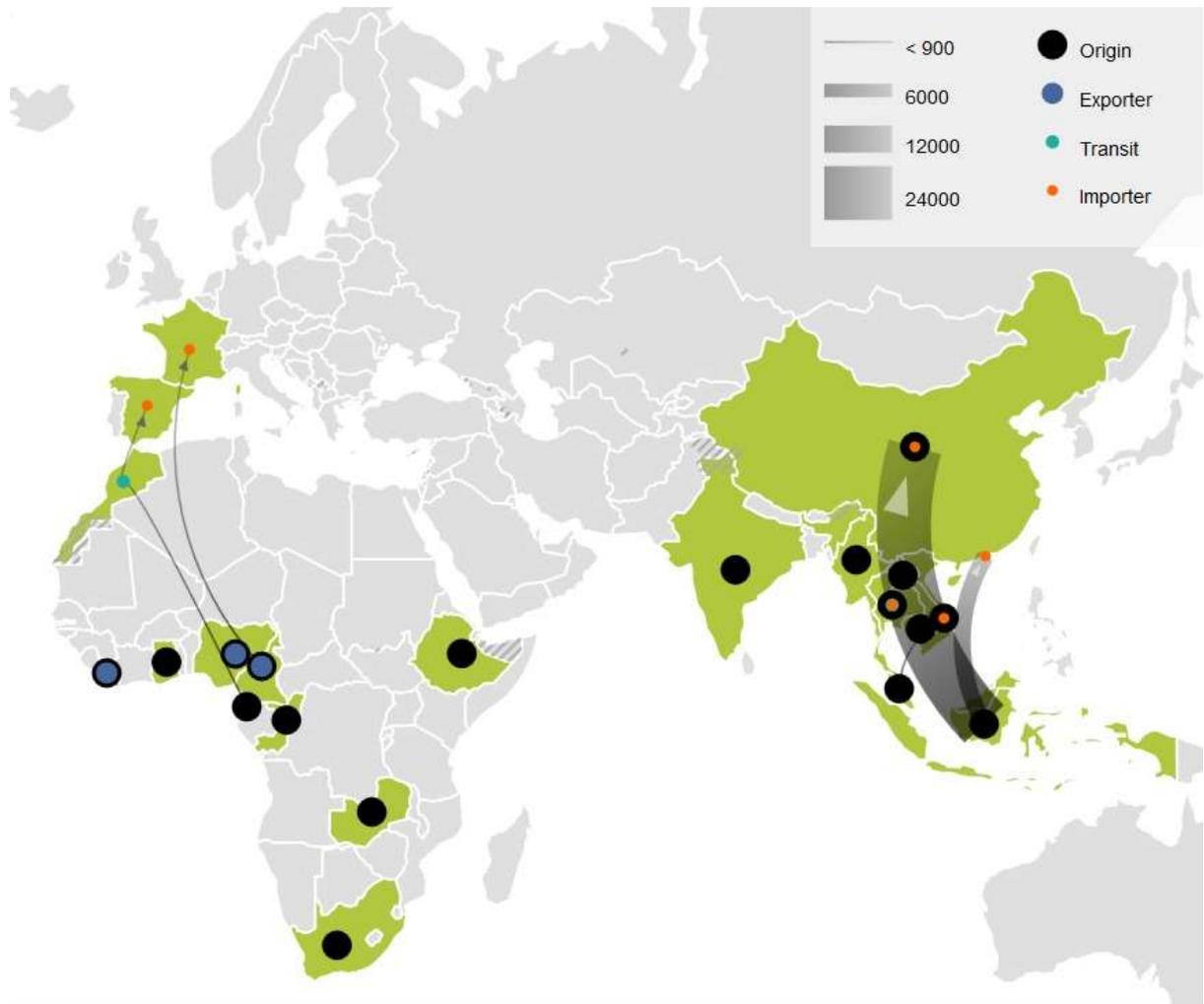
Fig. 15. Proportion of pangolins trafficked between 1999 and 2017 by derivative product.

trafficking of pangolins in Asia (Challender et al., 2015). Between 2008 and 2016 an average of approximately 20,000 pangolins were seized annually (Fig. 13, Fig. 14). Although there are fewer reported seizures for the years 1999 to 2007, and correspondingly fewer pangolins and/or their derivatives seized, research on illegal pangolin trade in Asia has estimated that between 2001 and 2007 the equivalent of approximately 17,000 animals were seized annually in this period (Challender et al., 2015). Although mainly comprising illegal trade in Asian pangolins, on this basis, between 2001 and 2016, the equivalent of approximately 18,000 pangolins have been trafficked annually at the global scale. This illegal trade has primarily involved live/dead pangolins, scales and meat, as well as a number of other derivatives including, *inter alia*, medicines, skins, shoes, skeletons, specimens and tails (Fig. 15).

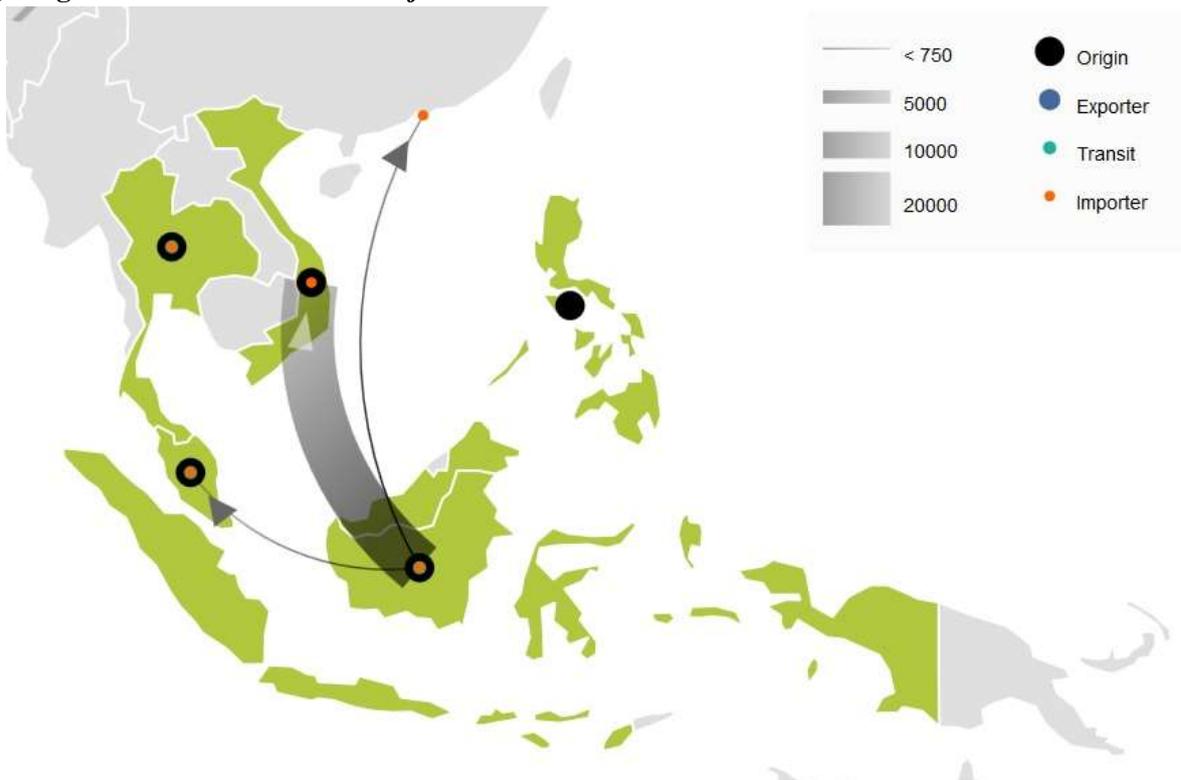
6.2.1 Live/dead pangolins

Illegal trade in live/dead pangolins involved an estimated 91,958 animals between 1999 and 2017 and comprised 48% of pangolin trafficking by volume (Fig. 15). Virtually all of this trade (99%) is accounted for by trafficking in *Manis* spp. and *M. javanica*. Illegal trade in *Manis* spp. accounted for 58% of this trade and involved an estimated 53,443 pangolins. Trade in live/dead *M. javanica* represents 41% of the trade and involved an estimated 38,008 animals. The bulk of trade in live/dead *Manis* spp. comprised large seizures made in Viet Nam in 2008 with reported origins of Indonesia which involved an estimated 25,842 pangolins, and if reported origin is correct this trade actually involved *M. javanica*. This includes the two large seizures discussed above that Viet Nam reported were allegedly destined for China (Fig. 16). Other available information on trafficking dynamics indicates that Viet Nam seized pangolins with alleged origins of Lao PDR and Malaysia (Fig. 16). Indonesia seized 12,727 pangolins

Fig. 16. (a) Illegal trade in live/dead ‘*Manis spp.*’ between 1999 and 2017. Trade flows represent estimated no. of pangolins



(b) Illegal trade in live/dead *Manis javanica* between 1999 and 2017.



but no further information was reported on trade routes other than that the animals originated in Indonesia. China reported seizing 4890 *Manis* spp. the majority of which allegedly originated in China, but other alleged origins included Myanmar (two animals) and Ethiopia (one animal). Thailand seized 4880 live/dead *Manis* spp. and reported to UNDOC that >4,600 of these animals originated in the country. Other available information indicates illegal trade in live/dead pangolins from Malaysia to Thailand involved at least 112 animals. Malaysia seized 4276 pangolins, of which >2,400 reportedly originated in the country, which if accurate would have included *M. javanica*, and otherwise seized 153 animals with reported origins of Indonesia (Fig. 16). Myanmar reported illegal trade in 408 animals, again most of which reportedly originated in the country, with the exception of 53 animals that reportedly originated in Malaysia. Cambodia, India and Hong Kong SAR reported seizing 22, six and 302 live/dead pangolins respectively.

Seizures of live/dead pangolins (*Manis* spp.) outside of Asia involved only 90 animals. This included an estimated 40 animals seized in Belgium in 2012 that were exported from Cameroon, the seizure of 20 animals in France between 2012 and 2015 with alleged origins of Cameroon, ten of which were reportedly destined for France, and the seizure of two animals in Spain in 2017 that were reportedly transited through Morocco and destined for Spain. The United States reported the seizure of 14 pangolin bodies between 2005 and 2016 with alleged origins of Cameroon, Equatorial Guinea, Ghana, Guinea, Lao PDR, Liberia and Nigeria. Four African Parties, Congo, South Africa, the United Republic of Tanzania and Zambia reported seizing 14 animals collectively between 2005 and 2015 and in all cases the animals reportedly originated in the country in which they were seized, and no additional information on trade dynamics were provided.

Illegal trade in live/dead *M. javanica* took place within Asia only. Approximately two-thirds of this trade (an estimated 25,811 animals from a total of 38,008) is accounted for by seizures made in Indonesia (Fig. 16). This includes an estimated 19,696 pangolins that were destined for Viet Nam, and includes the large seizure discussed above comprising an estimated 14,000 animals. From available information other alleged destinations for *M. javanica* seized in Indonesia comprise Hong Kong SAR and Malaysia. Thailand seized 4359 *M. javanica* in 108 seizures between 2007 and 2016 virtually all of which were reported to originate in Thailand but no additional information on trade dynamics was provided (Fig. 16). Similarly, Malaysia seized an estimated 4012 *M. javanica* in 61 seizures between 2003 and 2014, most of which reportedly originated in the country, with Hong Kong SAR the only alleged destination (for eleven live animals in 2013 based on available information). Finally, the Philippines seized 3570 *M. javanica* in two seizures in 2010 and 2013, Lao PDR seized 252 animals in two seizures in 2015 and 2016, for which Thailand was reported as a transit country, while Viet Nam seized four bodies in 2011 but no additional information was reported on trade dynamics.

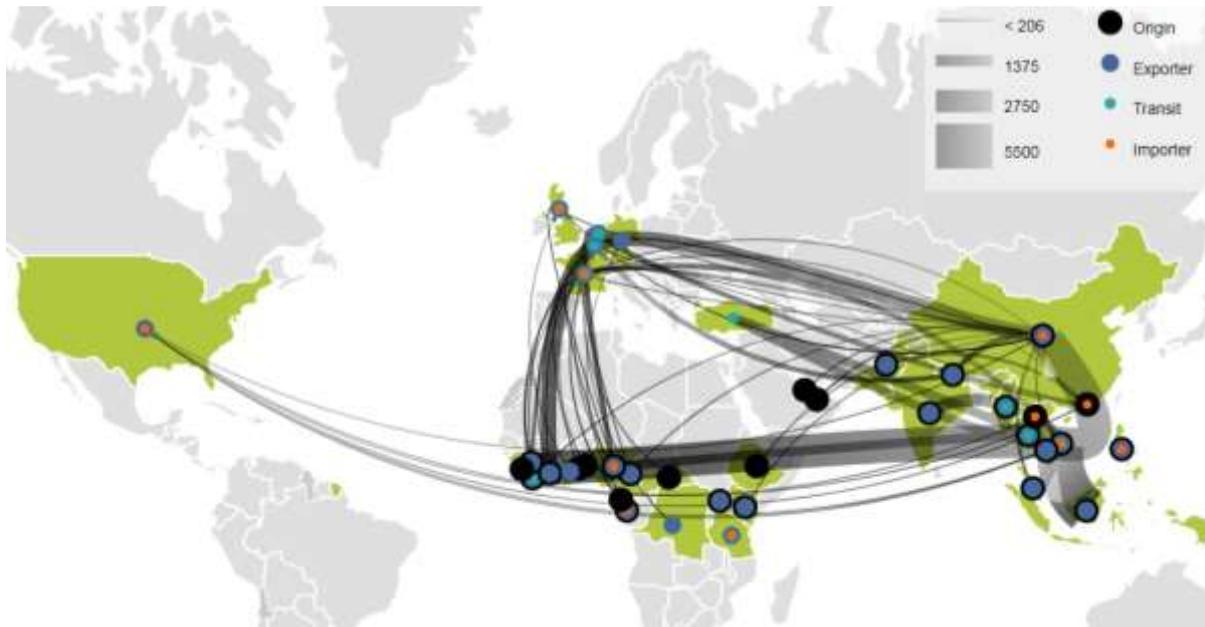
Trafficking in the other species of pangolin where they were identified to species level amounts to only 100 animals. This included the seizure of 25 live *M. pentadactyla*, 13 of which were seized in Thailand between 2010 and 2017, ten of which were seized in Nepal in 2015, and the remaining two animals were seized in Japan in 2012, but no additional information on trade dynamics was reported. Reported illegal trade involving *M. culionensis* included the seizure of four dead animals in the Philippines in 2016. In terms of African pangolins, 57 *M. temminckii* were seized between 2005 and 2015 in Congo (one animal), Kenya (two animals), Namibia (two animals), South Africa (15 animals), United States (one animal), Zambia (four animals) and Zimbabwe (33 animals) though no additional information on trafficking dynamics was reported. Illegal trade in live/dead *M. gigantea* included the seizure of three dead animals in France in 2012 that had allegedly originated in Cameroon and had been transited through Belgium and were destined for France. It otherwise involved the seizure of one dead animal in Congo in 2015. Finally, ten live *M. tricuspis* were seized in the United States in 2007 which had an alleged origin of Cameroon.

6.2.2 Scales

Illegal trade in pangolin scales involved an estimated 91,899 pangolins, or 48% of pangolin trafficking by volume between 1999 and 2017 (Fig. 15). Like seizures of live/dead pangolins, the majority of this trade (64%, an estimated 58,484 pangolins) reportedly comprised '*Manis* spp.' as most seizure reports did not record the species involved. The trafficking of scales involves multifaceted trade routes and countries in Asia, Africa, Europe, the Americas and Oceania and the dynamics of this trade involving *Manis* spp. scales are discussed below by geographic region.

Seizures in Asia accounted for the majority of illegal trade in *Manis* spp. scales by volume (90%, an estimated 52,835 pangolins) and Asia acted as both a source for scales trafficked within the region and as a destination for scales trafficked from a range of African countries. China seized 6298 kg of scales (the equivalent of 17,471 animals) in 200 seizures between 2005 and 2011. According to data in UNODC's World WISE database China was the origin of 14,507 animal's worth of these scales. Other alleged origins included Ethiopia, Hong Kong SAR, Kenya, Malaysia, Nepal, Qatar and the United Arab Emirates (neither Qatar nor the United Arab Emirates are pangolin range States). The most significant alleged origin of these scales by volume was Malaysia (137 kg) (Fig. 17a). Viet Nam seized 4724 kg of scales (equivalent to an estimated 13,104 *Manis* spp.) in four seizures between 2009 and 2014. Of these scales, 990 kg reportedly originated in Viet Nam, 2000 kg allegedly originated in Indonesia, 263 kg allegedly originated in Lao PDR, and 1471 kg of scales (involving an estimated 4080 pangolins) allegedly originated in Sierra Leone (Fig. 17a). India seized 3500.5 kg of scales (an estimated 9,432 *Manis* spp.) in 78 seizures between 2012 and 2017, 1503 kg of which included Myanmar as a country of transit, though it is unclear whether these scales were going to or from Myanmar. Thailand seized 629 kg of scales (equating to 1745 pangolins) in eight seizures, two of which in 2014 included

Fig. 17. (a) Illegal trade in ‘*Manis spp.*’ scales between 1999 and 2017. Trade flows represent estimated no. of pangolins.

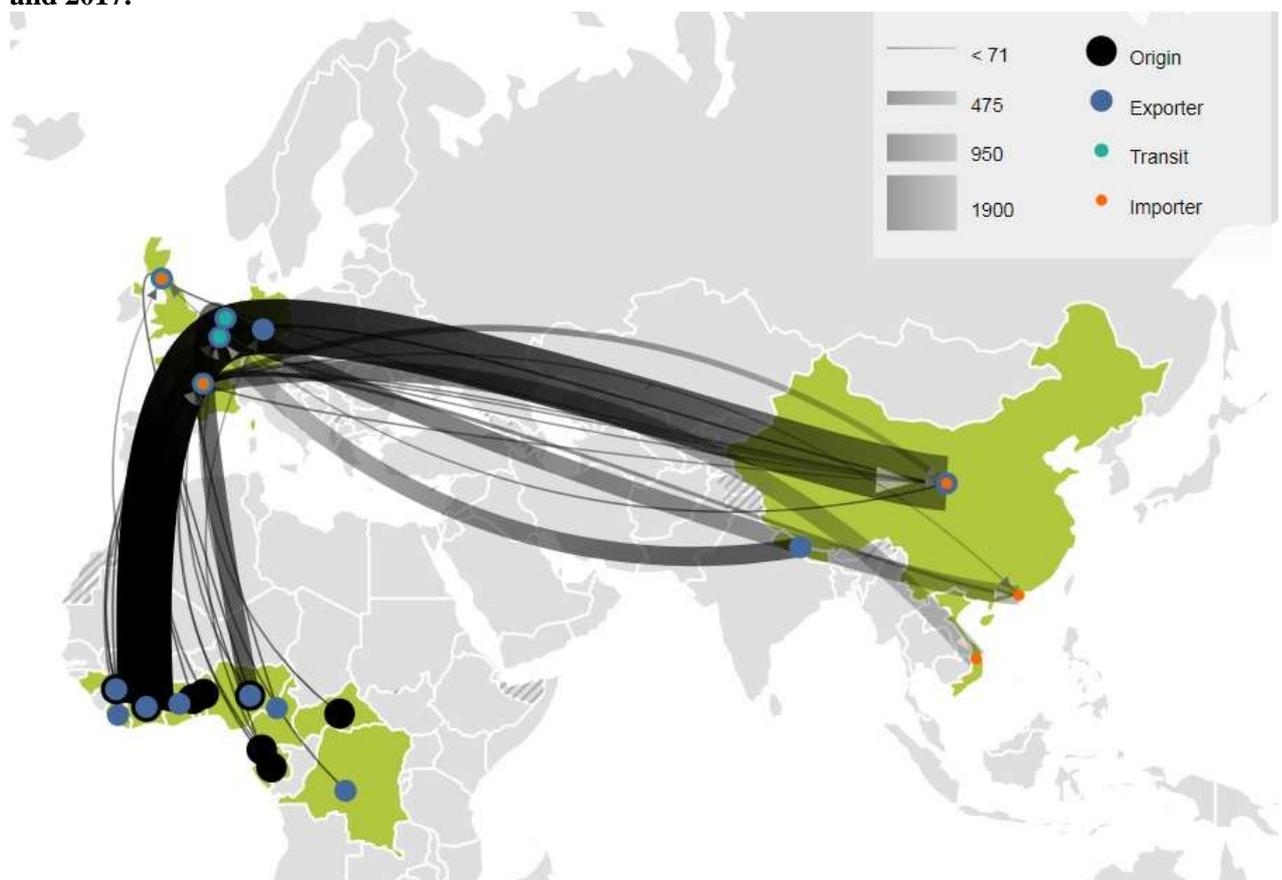


the equivalent of 1162 pangolins that originated in Nigeria and were transited through Turkey destined for Lao PDR. No further information on trade dynamics was provided by Thailand. Pakistan made one seizure of 145 kg of scales in 2014 (involving an estimated 402 *Manis spp.*) that had an alleged destination of Hong Kong SAR. The following Parties seized the below quantities of scales and equivalent number of pangolins between 2007 and 2015 but no further information was available on trafficking dynamics: Indonesia (880 kg, 2440 animals), Malaysia (36.1 kg, 92 animals), Myanmar (2340 kg, 6490 animals), Nepal (491 kg, 1361 animals) and the Philippines (107.35 kg, 298 animals) (Fig. 17a).

Illegal trade in scales where specific species of Asian pangolins were reportedly involved included *M. javanica*, *M. pentadactyla* and *M. crassicaudata*. A total of 3915 kg of scales involving an estimated 9716 *M. javanica* were seized between 2001 and 2016. The majority of these scales (2400 kg, equivalent to 5517 animals) originated in and were seized in Indonesia with alleged destinations for small volumes of these scales comprising China and Hong Kong SAR. Malaysia and the Philippines seized 1328 kg and 1.1 kg respectively, and Viet Nam seized 175 kg scales. India reported seizing scales from both *M. pentadactyla* and *M. crassicaudata*. This included 73 kg of *M. pentadactyla* scales in four seizures between 2009 and 2015 (including an estimated 129 animals) and 1724 kg of *M. crassicaudata* scales in ten seizures between 2011 and 2017 (involving an estimated 1724 pangolins. Reported transit countries associated with these seizures included Myanmar, Nepal and China.

Seizures made in Europe involving *Manis* spp. scales between 2009 and 2017 (though data are incomplete for 2017) indicate that it acts as a thoroughfare for trafficking scales from Africa to Asia, though low quantities of scales were also destined to European countries. Belgium made 22 seizures in 2012 and 2013 which involved 945.5 kg (an estimated 2623 pangolins) with alleged origins of Cameroon, Côte d'Ivoire, DRC, Guinea, Liberia and Nepal. Thirteen of these seizure had alleged destinations of China, including the seizure of 678 kg of scales (an estimated 1,881 pangolins) that had alleged origins of Côte d'Ivoire (Fig. 17b). Belgium also seized 240 kg of scales (an estimated 666 pangolins) that had been exported from Nepal. Similar to Belgium, Germany seized 14 kg of scales in 2012 and 2013 from Equatorial Guinea (equivalent to an estimated 38 *Manis* spp.) but no further information was reported on trade routes. France seized 417 kg of scales in 23 seizures between 2012 and 2015 (equating to an estimated 1,155 pangolins) with alleged origins of Benin, Côte d'Ivoire, Central African Republic, Equatorial Guinea, Gabon, Guinea and Togo. Based on available information most of this trade was destined for Viet Nam (250 kg scales), China (99 kg scales) and Hong Kong SAR (53 kg scales) (Fig. 17b). The UK made three seizures between 2014 and 2017 involving small quantities of scales (e.g., 2 individual scales – 4.28 kg) that allegedly originated in Nigeria and China and were destined for the UK. The UK also seized small quantities of tablets, capsules and tubes of cream containing scales in 11 seizures between 2013 and 2017 that were exported from China. The Netherlands made 13 seizures, all in 2016, which involved 259 kg of scales (an estimated 718 pangolins) exported from Nigeria, almost all of which was destined for Hong Kong SAR (Fig. 17b).

Fig. 17 (b) Illegal trade in '*Manis* spp.' scales based on seizures made in Europe between 2012 and 2017.



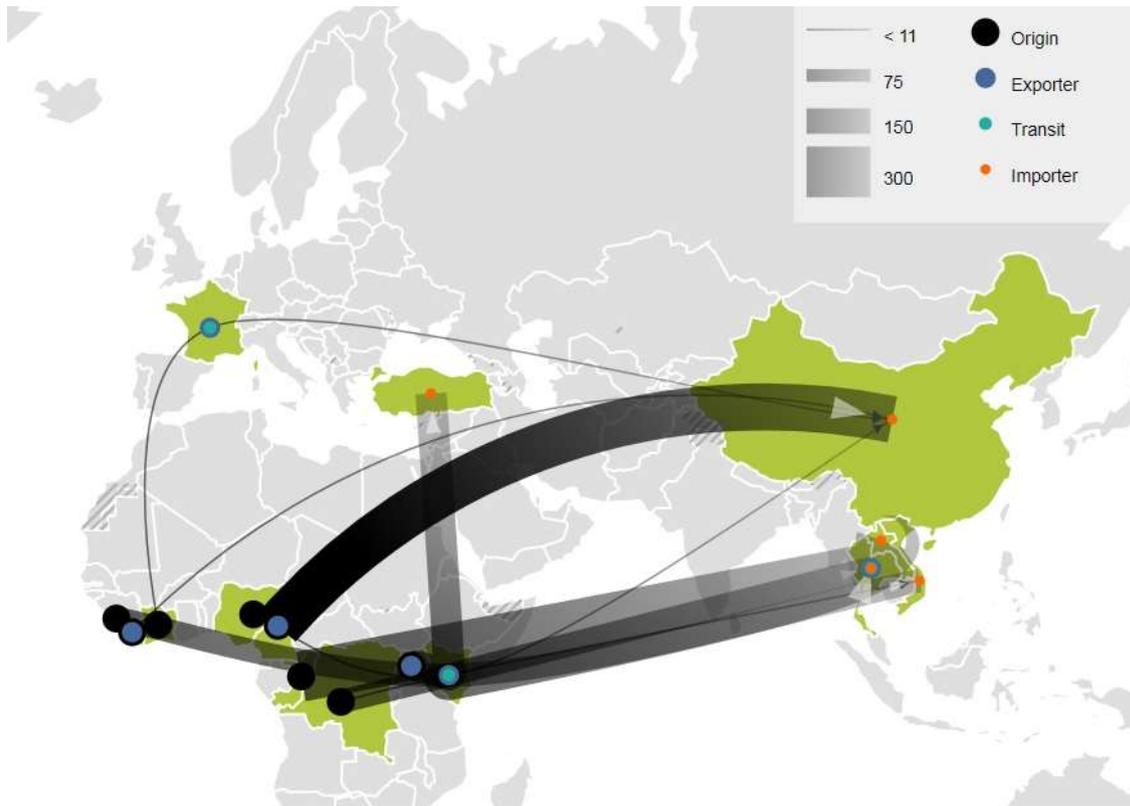
Seven countries in Africa reported seizures of *Manis* spp. scales, which based on available information on trafficking routes were allegedly destined for other African countries or to China. This included Cameroon which seized 14 sacks of scales (quantity of scales unknown) and 44 kg of scales (involving an estimated 122 pangolins) in three seizures in 2013, that were allegedly destined to either Nigeria (7 sacks of scales) or China (44 kg of scales). Kenya seized approximately 136 kg of scales in 2012 (an estimated 378 pangolins) that allegedly originated in Uganda, and Liberia seized 50 kg of scales in 2015 that were allegedly destined for China. The following Parties seized the below quantities and estimated number of pangolins but no further information was provided on trade dynamics: Côte d'Ivoire (4 sacks (quantity unknown), 2017), Gabon (32 kg, 89 pangolins, 2015), and Uganda (125 kg, 347 pangolins, 2012). In addition to these seizures, there have been others involving large quantities of scales in the last few years but which were not reported by Parties in their responses to Notifications to the Parties 2017/035 or 2014/059, or have taken place very recently (see section 7.2.6).

Illegal trade involving scales from specific species of African pangolins in substantial volumes included *M. gigantea* and *M. tricuspis*. This included 6115 kg of *M. gigantea* scales (an estimated 1,697 animals). The majority of these scales (2270 kg) were seized in seven seizures in Uganda in 2014 and 2015. A total of 1670 kg of *M. gigantea* scales were also seized in Kenya in eight seizures between 2013 and 2016 and which had alleged destinations of China, Thailand, Turkey, and Viet Nam (Fig. 18). Cameroon seized 1000 kg of scales in 2014 which had an alleged destination of China (Fig. 18). France seized about 3 kg of scales in 2012 which allegedly originated from Côte d'Ivoire and were in transit to China while Liberia seized two suitcases of *M. gigantea* scales in 2014 that were also allegedly destined to China. Finally, Thailand seized 1066 kg of scales in 2017 that allegedly originated from DRC and had transited through Kenya to Thailand with an alleged destination of Lao PDR (Fig. 18).

Illegal trade in specific species also involved *M. tricuspis* scales totalling 287 kg (equating to an estimated 695 animals). The majority of this trade is accounted for by the seizure of 221 kg of scales in Togo in 2014. France seized 30 kg of scales in 2013 that were allegedly destined for Viet Nam, while Cameroon seized 9.5 sacks of scales in 2013 and 2014 for which Nigeria was a transit country and that had an alleged destination of China. Kenya seized a small volume of *M. tricuspis* scales in the last five years.

The United States made 16 seizures of *Manis* spp. scales between 1999 and 2016 involving 4 kg from an estimated 12 animals. Almost all of these seizures involved trade destined for the United States which had alleged origins of Cambodia, China, Hong Kong SAR, Lao PDR, Thailand and Viet Nam. The United States also seized 2.73 kg of scales from *M. javanica* in 2001 and 0.4 kg of *M. pentadactyla* scales in 2009.

Fig. 18. Illegal trade in *M. gigantea* scales between 2012 and 2017. Trade flows represent estimated no. of pangolins.



6.2.3 Meat

Illegal trade in meat involved an estimated 4884 pangolins between 1999 and 2017 (4% of overall trafficking by volume; Fig. 15). Approximately 50% of this illegal trade is accounted for by seven seizures made in Indonesia between 2008 and 2016 that involved an estimated 2545 animals (1495 *Manis* spp. and 1050 *M. javanica*) and were allegedly destined to Singapore and Viet Nam (Fig. 19). It also involved one seizure in Viet Nam in 2008 which involved an estimated 1089 *Manis* spp., and one seizure in Malaysia in 2011 which involved an estimated 1087 *Manis* spp. that had an alleged destination of the Philippines (Fig. 19). Otherwise, this trade involved small quantities of meat from *Manis* spp. Between 2003 and 2017, 57 seizures involving 0.4 – 26.5 kg of meat were made in Belgium, Congo, France, Gabon, the Philippines, Spain, Switzerland and the United States with alleged origins of Cameroon, Central African Republic, Côte d’Ivoire, Ethiopia, France, Gabon, Ghana, Liberia, Nigeria, the Philippines, Thailand and Togo, and alleged destinations of China, Congo, France, Gabon, the Philippines and the United States (Fig. 19). Finally, this trade also involved the seizure of meat from 62 *M. culionensis* in the Philippines in 2017, and the seizure of meat from one *M. tricuspis* in Gabon in 2011, and one *M. pentadactyla* in the United States in 1999.

Fig. 19. Illegal trade meat from *Manis* spp. between 1999 and 2017. Trade flows represent estimated no. of pangolins.



6.2.4 Medicine

Illegal trade in medicines involved the seizure of 27, 635 units in 207 seizures between 2000 and 2016. The vast majority of this trade (89%, 24,559/27,635 units) consisted of medicines containing *M. pentadactyla* specifically that were seized in the United States between 2000 and 2016 with shipments ranging in size from <1 to 9000 units. The main, alleged countries of origin by volume comprised China (6470 units) and Viet Nam (5285 units) (Fig. 20). Trade in medicines including *Manis* spp. accounted for a further 3073 units that were traded between 2000 and 2016 that were seized in the United States (2769 units), New Zealand (276 units) and Japan (28 units). The origin of trade into the United States is largely unknown but where alleged origins are reported they include China and Viet Nam. Seven units of medicines including *M. javanica* were also seized in the United States in 2011 allegedly originating from Thailand.

6.2.5 Other

A range of other pangolin parts and derivatives were seized between 1999 and 2017. This included the seizure of 14,063 kg of ‘other products’, which consisted of 7853 kg seized in China (which also seized 3003 units of ‘other’) and the seizure of 6200 kg in Viet Nam with an alleged origin of Indonesia. The United States seized a range of derivative products including ten *M. tetradactyla* skeletons from Cameroon, four *M. tetradactyla* skulls, 112 shoes, 32 skins pieces, three *Manis* spp. tails, 14 large/small leather products, three garments, three feet and one claw. Also seized were four trophies, two in Sudan, one *M. gigantea* trophy seized in the United States with an alleged origin of Liberia, and one *M. javanica* trophy seized in Indonesia; eleven specimens seized in Hong Kong SAR and nine flasks of specimens

Fig. 20. Illegal trade in medicines involving *M. pentadactyla* (24, 559 units) between 2000 and 2016. Trade flows represent no. of units.



seized in Singapore, 136.7 kg of parts and derivatives, 1493 other parts and derivatives which were mainly seized by New Zealand (1289); and one stuffed pangolin seized in Indonesia.

6.2.6 Information from other sources

The biggest trend in pangolin trafficking in recent years, since 2008/2009, has been the emergence of intercontinental trafficking of pangolin scales from Africa to Asian markets. In addition to illegal trade discussed above, other information indicates that additional seizures of large quantities of scales have taken place in the last few years, including in 2017. Selected examples include the following which took place between 2014 and 2017 and involved scales from an estimated 86,000 pangolins.

- the seizure of more than three tonnes of scales in Hong Kong SAR in two shipping containers that had arrived from Uganda and that had transited in Kenya and Malaysia in 2014 (Lo 2014);
- the seizure of 12.3 tonnes of scales from Nigeria in three shipments, two in Hong Kong SAR (two tonnes in 2015 and 7.2 tonnes in 2017; Anon 2015; Lo 2017), and one shipment in China (3.1 tonnes in 2016; Anon 2016b);
- the seizure of 4 tonnes of scales in Hong Kong SAR in 2016 that had originated in Cameroon in June 2016 (Actman 2016);
- the seizure of 712 kg of scales in Malaysia that had arrived in two shipments, one from Ghana that had transited in Dubai, and a second from DRC that had transited in Kenya and Dubai (Anon 2017b); and
- three tonnes of pangolin scales seized in Côte d’Ivoire in 2017 (Anon 2017c); and
- the seizure of eight tonnes of pangolin scales in Sabah, Malaysia in 2017 (Anon 2017d).

7. Legislation and enforcement

This section covers legislation regulating international trade in native and non-native species of pangolin; regulation of domestic use of pangolins; minimum and maximum penalties that could be imposed in accordance with relevant national legislation for illegal activities concerning pangolins; forensic analyses of pangolin specimens; regulations for managing, storing and disposing of pangolin specimens; enforcement challenges; best practices and actions aimed at combatting poaching and trafficking of pangolins; and collaboration between Parties and international operations (e.g., with INTERPOL) to combat poaching and trafficking of pangolins.

7.1 Legislation regulating international trade in pangolins

Based on responses to Notifications to the Parties No. 2017/035 and 2014/059, 39 Parties have adopted legislation to regulate international trade in native and/or non-native species of Asian and African pangolins. However, there were responses from a number of EU countries and recognising that the EU Wildlife Trade Regulations apply to all EU member States means it is possible to assess legislation regulating international trade in pangolins for 66 Parties (i.e. all Parties who responded to the above notifications and all EU member States). On this basis, 21 Parties reported to the above Notifications to the Parties that they regulate international trade in native and non-native species, and 12 Parties reported that they regulate international trade in native species only (Table 9; see Annex 2 for applicable legislation). A total of 32 Parties, which all includes all EU member States, regulate international trade in non-native species of pangolin only (Table 9; Annex 2).

Table 9 Parties with legislation regulating international trade in native and/or non-native species of pangolin

Species of pangolin afforded protection	Party
Native and non-native species of pangolin	Bhutan, Botswana, Chad, China, Central African Republic, Ghana, Kenya, India, Indonesia, Malaysia, Myanmar, Namibia, Nepal, Pakistan, the Philippines, Singapore, Thailand, Togo, Uganda, Viet Nam, Zambia.
Native species of pangolin only	Bangladesh, Benin, Cambodia, Cameroon, Côte d'Ivoire, Gabon, Lao PDR, Liberia, Nigeria, Senegal, South Africa, Zimbabwe
Non-native species of pangolin only	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Arab Emirates, United Kingdom, United States

The following Parties reported that they do not regulate international trade in native or non-native species of pangolins: Angola, Bahrain, Brunei Darussalam, Monaco, Montenegro, Tunisia and the United Republic of Tanzania. The authors understand that pangolins are afforded protection in Angola under the Ruling on the Protection of Land, Flora and Fauna (Decree no. 40.040 of 1955). Similarly, although pangolins are not listed as protected species in Brunei Darussalam or the United Republic of Tanzania, they receive legislative protection under broader biodiversity regulation under the Wildlife Protection Act (1981) and Forestry Act (2002) in Brunei Darussalam, and the Wildlife Act (2013) and Wildlife Conservation (National Game) Order of 1974 in the United Republic of Tanzania.

7.2 Regulation of harvesting and use of pangolins

Based on responses to Notifications to the Parties 2017/035 and 2014/059, 41 Parties stated that they regulate the domestic use of pangolin specimens. However, there were responses from a number of EU countries and recognising that the EU Wildlife Trade Regulations apply to all EU member States means it is possible to assess legislation regulating domestic use of pangolins for 73 Parties (i.e. all Parties that responded to the above notifications and all EU member States). On this basis, 65 Parties regulate domestic use of pangolins and eight Parties reported that domestic use of pangolins is not regulated (Table 10). Table 2 in Annex 2 includes additional information on permitted and forbidden uses.

Table 10 Parties that do and do not regulate domestic use of pangolins

Domestic use regulated?	Party
Parties that regulate domestic use of pangolins	Austria, Bangladesh, Belgium, Benin, Botswana, Bhutan, Bulgaria, Cambodia, Cameroon, Central African Republic, Chad, China, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Hungary, India, Indonesia, Ireland, Italy, Japan, Kenya, Latvia, Lithuania, Luxembourg, Malaysia (only for Sabah), Malta, Myanmar, Namibia, Nepal, the Netherlands, Nigeria, Pakistan, the Philippines, Poland, Portugal, Romania, Senegal, Singapore, Slovakia, Slovenia, Spain, South Africa, Sweden, Switzerland, Thailand, Togo, Uganda, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Viet Nam, Zambia, Zimbabwe.
Parties that do not regulate domestic use of pangolins	Angola, Bahrain, Lao PDR, Liberia, Malaysia (excluding Sabah), Monaco, Montenegro, Tunisia

7.3 Minimum and maximum penalties for illegal activities

In response to Notifications to the Parties No. 2017/035 and 2014/059 and based on information from UNODC's World WISE database, details on minimum and maximum penalties for illegal activities concerning pangolins and information on arrests, convictions and penalties are available for 60 Parties (Table 11). Penalties vary with fines ranging from USD 6 in Côte d'Ivoire to USD 880, 000 in France, and prison terms range from 14 days in Pakistan up to life imprisonment in China. Based on available information, regular arrests and prosecutions are being made, and/or penalties given to perpetrators of

crimes of involving pangolins in France, Indonesia, Kenya, Malaysia, Nepal, the Philippines, Thailand, Uganda, Viet Nam, the United States and Zimbabwe. Despite seizures appearing to take place with some frequency in the following countries, no further information was provided on arrests, convictions and associated penalties: Belgium, China, France, Gabon, India, Myanmar, Namibia, the Netherlands, New Zealand, South Africa, Switzerland, United Kingdom, United Republic of Tanzania, and the United States.

Table 11. Minimum and maximum penalties for poaching and other illegal activities concerning pangolins and information on arrests, convictions and penalties based on information submitted in response to Notifications to the Parties 2017/35 and 2014/059 and from UNODC’s World WISE data. N.B. Information on penalties is based on details of all legislation provided by Parties, for example minimum penalty may be prescribed in wildlife legislation and maximum in customs law (see Annex 2 for further details). Time period comprises the period of time over which seizures, arrests, and convictions were made and penalties imposed.

Party	Penalties (fine; imprisonment term)		No. of seizures reported	Arrests	Convictions	Penalties	Time period
	Min.	Max.					
ASIAN RANGE STATES							
Bangladesh	-	USD3,650; 3 years	-	-	-	-	-
Bhutan	USD78; up to 7 years	USD3120; up to 7 years	-	-	-	-	-
Brunei Darussalam	Up to USD100,000; 5 years	Up to USD100,000; 5 years	-	-	-	-	-
Cambodia	Two-three times market value of trafficked wildlife	USD24,000; ≤ 5 years	2	2	1	Perpetrator fined	2009 – 2011
China	≤5 years	Life imprisonment	222	1	-	-	2005 - 2015
India	≤USD400; ≤3 years	USD8-80,000 and 7 years	98	-	-	-	2011 - 2017
Indonesia	<USD4000; ≤1 year	≤USD4000 and ≤5 years	122	15	7	Fines of between USD250-750 and prison sentences of 6-18 months	2005 - 2016
Lao PDR	Information not provided	Information not provided	2	-	-	-	2015 - 2016
Malaysia	USD 2,400; 1 year	≤USD60,000 and/or ≤5 years	182	83	67	Fines of between USD150-6000 and prison sentences of 1-24 months (67 cases)	2003 - 2017

Myanmar		USD400 and/or \leq 7 years	50	-	-	-	2009 - 2015
Nepal	USD5000 and 5 years	USD10,000 and 5-15 years	3	-	<i>Note: 65 people prosecuted between 2010 and 2015</i>		2010 - 2015
Pakistan	USD100; 2 weeks (Wildlife & Biodiversity Act 2014).	USD10,000; 1-2 years (Pakistan Trade Control of Wild Fauna & Flora Act 2012).	1	-	-	-	2014
Philippines	USD600 and/or 2 years and 1 day	USD2000-20,000 and/or 6 years and 1 day – 12 years	16	3	1	Fine of USD100,000 and 6-12 years prison sentence	2010 - 2017
Singapore	\leq USD750	Up USD37,000 per species (USD370000 total) and/or up to 2 years	1	-	-	-	2004
Thailand		USD1200 and up to 4 years	172	41	3	Fines of USD75 and prison sentences of 1-4 years	2007 - 2017
Viet Nam		USD2300-23,000 and 6 months to 7 years	31	13	4	Fines (at unknown levels) and warnings.	2008 - 2015

AFRICAN RANGE STATES

Benin	USD200; 1 year	USD900; 3 years	-	-	-	-	-
Botswana		USD1000; 7 years	-	-	-	-	-
Cameroon	USD900; 1 year	USD5500; 3 years	9	-	-	-	2012 - 2014
Central African Republic	USD900; 1 year	USD9000; 5 years	-	-	-	-	-
Chad	USD200 and/or 1 year	USD200 and/or 3 years	-	-	-	-	-
Congo	Information not provided	Information not provided	3	-	-	-	2015

Côte d'Ivoire	USD6 and/or 2 months	USD1200 and/or 2 years	1	-	-	-	2017
Gabon	USD200 and/or 3 months	USD18,000 and/or six months	26	-	-	-	2011 - 2015
Ghana	USD200 and/or 6 months	USD500 and/or 6 months	-	-	-	-	-
Kenya	USD10,000 and/or up to 5 years	USD10,000 and/or up to 5 years	15	4	4 people prosecuted	-	2012 – 2016
Liberia	USD500 and/or 6 months	USD500 and/or 1 year	2	1	1	Deportation	2014 - 2015
Namibia		Up to USD15,000 and/or 20 years	14	-	-	-	2012 - 2016
Nigeria		USD1500 and/or 5 years	-	-	-	-	-
Senegal	1 year	5 years	-	-	-	-	-
South Africa		USD760,000 and/or up to 10 years; <i>Fine may be up to three times commercial value of specimen, whichever is higher</i>	18	-	-	-	2006 – 2014
Togo	USD90 and/or 1 month	USD180 and/or 1 year	2	-	-	-	2014
Uganda	USD35 and/or ≤5 years, <i>though the fine shall not be less than the value of the specimen</i>	USD35,000; ≤7 years, <i>finer shall not be less than the value of the specimen</i>	9	2	2	Prison terms of 1 – 1.5 years	2012 - 2015
United Republic of Tanzania	Up to USD2200; 20 years	Up to USD2200; 30 years <i>Fine may be ten times the value of the trophy whichever is higher</i>	11	-	-	-	2010 - 2015

Zambia		USD5500 and/or ≤ 5 years	6	-	-	-	2005 - 2015
Zimbabwe	USD5000; 9 years		30	26	9	Fines of USD200-1,000	2012 - 2015
NON-RANGE STATES							
Austria		5 years	-	-	-	-	-
Belgium	Information not provided	Information not provided	26	-	-	-	2012 – 2015
Bulgaria	USD4000	USD20,000; 5 years	-	-	-	-	-
Denmark	Warning	1 year	-	-	-	-	-
France		USD880,000; 7 years (Law for the Recovery of Biodiversity, Nature and Landscapes 2016); Ten times value of subject-matter; 10 years (Customs Code)	47	-	-	-	2012 – 2015
Georgia		USD800	-	-	-	-	-
Germany	Information not provided	Information not provided	4	-	-	-	2012 - 2013
Greece	USD1800; 2 months	USD35,000; 2 years	-	-	-	-	-
Hong Kong SAR	Information not provided	Information not provided	3	-	-	-	2013 - 2015
Italy	USD12,000; 3 months	USD120,000; 12 months	-	-	-	-	-
Japan		USD46,000 and/or 5 years	2	-	-	-	2012 - 2014
Latvia	USD70	USD1400	-	-	-	-	-
Malta	Information not provided	Information not provided	1	-	-	-	2014
Montenegro	USD60	USD60,000	-	-	-	-	-

Netherlands		USD100,000; 6 years	13	-	-	-	2016
New Zealand	Information not provided	Information not provided	59	-	-	-	2007 - 2013
Norway	Information not provided	Information not provided	1	-	-	-	2009
Slovakia	USD100	USD80,000; 8 years	-	-	-	-	-
Spain	200-225% of the value of the specimen; establishment closure from 4 days – 3 months (administrative sanctions)	275-350% of the value of the specimen; establishment closure from 9 months and 1 day to 12 months (administrative sanctions)	2	-	-	-	2017
	100% value of the seized specimens; 1 year (smuggling offences)	600% value of the seized specimen; 5 years (smuggling offences)					
Sweden		4 years	-	-	-	-	-
Switzerland		USD42,000 and/or 3 years	9	-	-	-	2012 - 2017
Tunisia	USD200; 16 days	USD2000; 6 months	-	-	-	-	-
United Arab Emirates (UAE)	USD1400; ≤3 months	USD8000; ≤3 months	2	-	-	-	2006
United Kingdom of Great Britain and Northern Ireland	Information not provided	Information not provided	14	-	-	-	2013 - 2017
United States	USD500	USD500,000; 5 years (Criminal felony)	325	-	-	-	1999 - 2016

7.4 Forensic analysis of pangolin specimens

Based on notification responses, ten Parties reported they have facilities that are able to carry out forensic analysis on seized pangolins specimens. In Africa, this comprises Kenya. In Asia, this includes India, Indonesia, Malaysia (only in Peninsular Malaysia and Sabah), Nepal and the Philippines. Non-range States with facilities to carry out forensic analyses include the Netherlands, Switzerland and the United States.

Other range and non-range States reported they do not have facilities to complete forensic analysis of seized pangolin specimens: Austria, Bahrain, Bulgaria, Cambodia, Comoros, Côte d'Ivoire, Denmark, France, Finland, Georgia, Ireland, Japan, Lao PDR, Liberia, Montenegro, Namibia, Nigeria, Pakistan, Senegal, Thailand, and Tunisia.

7.5 Forensic analyses conducted on pangolin specimens

Five Parties provided details on the results of forensic analyses carried out to date in their responses to the notifications. This includes Indonesia, Kenya, Malaysia, the Philippines and the United States though no information was provided on the frequency with which such analyses are carried out. Information on the forensic analyses conducted is presented below.

In Indonesia, both *M. javanica* and *M. pentadactyla* have been identified in various cases, though *M. javanica* has been the most frequently identified species. In Indonesia, molecular analysis by the Research Centre for Biology (LIPI) on seized specimens from Sumatra and Java demonstrated that 40% of specimens originated in Kalimantan (Borneo) (see Wirdateti et al., 2013).

In Kenya, the wildlife forensics and genetics laboratory is currently developing genetic profiles of pangolins based on seized specimens with the objective of developing a genetic reference library.

In Peninsular Malaysia species identification has been carried out by sequencing mitochondrial DNA extracted from seized materials, and which were later referred to local and international DNA databases to find the closest matching species based on the nucleotide sequences. In recent years, the National Wildlife Forensics Laboratory has analysed meat, blood and scales samples from pangolins and successfully identified the species.

In the Philippines analyses of seized pangolins was conducted in 2013 and 2014. In 2013, this included specimens from the seizure at Tubbataha Reefs National Park, analyses of which determined the pangolins being trafficking comprised *M. javanica*. Forensic analysis on specimens seized in 2014 in Puerto Princesa, Palawan determined the pangolins involved were *M. culionensis*.

In the United States, one pair of boots made from tanned skin exhibited diagnostic morphological characteristics of pangolins when examined at the National Fish and Wildlife Forensics Laboratory, identification that was verified when compared against specimens in the laboratory’s collection.

7.6 Regulations for managing, storing, and disposing of confiscated pangolins

Based on responses to Notifications to the Parties No. 2017/035 and 2014/059, 28 Parties have established regulations or standard operating procedures for managing, storing and disposing of seized pangolin specimens. However, most Parties have not. Table 12 details the titles of regulations where reported (or a brief description where Parties didn’t provide titles of regulations). A more comprehensive description of the regulations and standard operating procedures for managing seized pangolin specimens is presented in Table 4 in Annex 2. China reported in its response to Notification to 2014/059 that it has established such regulations but didn’t provide further details, though see section 8 for additional information on the management of stockpiles.

Pangolin range States in Africa and Asia and non-range States that stated they have not established regulations or standard operating procedures for managing, storing and disposing of confiscated pangolin specimens include the following Parties: Angola, Austria, Bahrain, Bangladesh, Bhutan, Botswana, Brunei Darussalam, Cambodia, Central African Republic, Chad, Côte d’Ivoire, Comoros, Denmark, France, Finland, Georgia, Ghana, Greece, Ireland, Lao PDR, Liberia, Malaysia, Monaco, Montenegro, Pakistan, Senegal, Sweden, Switzerland, South Africa, Tunisia, Togo, Uganda, United Republic of Tanzania, and Zimbabwe.

Table 12. Key provisions of regulations for managing, storing and disposing of confiscated pangolin specimens

Party	Regulation title (or brief description if title not available)
ASIAN RANGE STATES	
China	China reported in its response to Notification to 2014/059 that it has established regulations but didn’t provide any further details.
India	Provisions for disposal are detailed in the Wildlife (Protection) Act, 1972.
Indonesia	Ministry of Forestry Decree No. 4 (2010) on Handling Forestry Crime Evidence Director-General of Forest Protection and Nature Conservation No. 11 (2014) on Destruction of Findings, Confiscated and Spoils Evidences
Malaysia (Peninsular)	Live pangolins are released as soon as possible. Pangolin products are kept in a safe room/vault.
Malaysia (Sarawak)	Live pangolins are kept at Wildlife Centres while trophies/products are disposed of after any court cases are settled.

Myanmar	Confiscated animals/parts are to be confiscated and handed to the Forest Department where they be sold.
Nepal	Wildlife Stockpiles Management Procedure (2072) – used to manage wildlife stockpiles.
Pakistan	Live animals are usually released or sent to zoos. Confiscated specimens are usually disposed of.
Philippines	DENR Administrative Order 97-17 of April 29, 1997 - Establishing the Disposition Program for Confiscated and Donated Wildlife in the Custody of DENR Wildlife Rescue Centers and Similar DENR Facilities and Providing Guidelines. Also, PCSD Guidelines for ‘Apprehension, Seizure, Administrative Adjudication and Disposition of Confiscated, Donated or Turned-Over Wildlife’. These guidelines are used for the confiscation of live specimens.
Singapore	All confiscated wildlife sent to Wildlife Reserves Singapore. For parts and derivatives, they will be disposed of in line with Res. Conf. 10.7 and 9.10.
Thailand	Regulation on the management of wild animals carcasses is entrusted to the State in Regulation B.E. 2540
Viet Nam	Decision 90/2008/EN

AFRICAN RANGE STATES

Benin	Animals and their parts are either released (if live) or sent to research centres.
Cameroon	Scales are kept in a store in Yaoundé.
Gabon	Article 278 of Law 016/2001; Decree 0163/PR/MEF of 19 January 2011.
Kenya	Live pangolins are relocated back to the wild. Products and/or derivatives are destroyed by various agencies of the government of Kenya.
Namibia	Confiscated wildlife products are taken to the Ministry of Environment and Tourism head office for safe keeping. All seized live pangolins are released in National Parks.
Nigeria	Live animals are taken to rescue centres. Pangolin scales are held by the National Environmental Standard Regulatory Enforcement Agency (NESREA).
Senegal	Regulations and laws are outlined in the hunting code
Zambia	Once court proceedings are concluded, live animals are released where possible.

NON-RANGE STATES

Bulgaria	Standard Operating Procedures are outlined in national legislation.
Italy	Stockpiles of pangolin products and parts are managed by Corpo forestale dello Stato.
Japan	Confiscations are managed by the CITES Management Authority of Japan
Latvia	All live CITES species confiscated are kept in zoological gardens. Parts and derivatives are used for educational purposes or disposed of.
Netherlands	Seized items are stored by the government at authorised keepers.
Slovakia	Article 26 of Act No 15/2005.

Spain	Regulation applicable to seized specimens are general are detailed in Royal Decree 1333/2006.
United Arab Emirates	The procedure varies depending on whether a live pangolin or products is seized. No further information was provided.
United States	Detailed in Code of Federal Regulations (50) 12, Seizure and Forfeiture Procedures, which applies to live specimens and parts and products.

7.7 Enforcement challenges in combatting illegal trade in pangolins

A number of enforcement challenges were identified by range States in Africa and Asia concerning poaching, illegal trade and other illegal activities involving pangolins.

Key enforcement challenges identified are:

- A lack of equipment and resources (e.g., scanners, sniffer dogs) to detect pangolin derivatives being trafficked.
- Lack of capacity among enforcement personnel to identify pangolins and their parts and derivatives in illegal trade.
- In China, penalties relate to the number of pangolins involved in trafficking cases. Lack of conversion parameters for the Indian, Philippine and African pangolins from quantities of scales means estimating the number of pangolins involved to inform judiciaries in determining penalties is challenging.

Additional enforcement challenges identified in Asia include:

- Enforcing wildlife trade regulations along long international borders that cannot be monitored 24 hours a day, seven days a week.
- Monitoring illegal wildlife trade in pangolins that takes place online.
- Ensuring effective enforcement in remote areas where pangolins occur, including in plantations (e.g., oil palm plantations) and border areas, and especially in the context of high prices being offered to local community members for pangolins which provides a strong incentive for them to poach the animals.

7.8 Enforcement best practices in combating illegal trade in pangolins

A number of law enforcement best practices regarding the poaching, illegal trade and other illegal activities involving pangolins were reported by Parties, mainly pangolin range States.

In Africa, reported best practices include:

- Use of well-trained wildlife professionals accompanied by canine units at all international entry and exit points (ports and seaports).
- Use of private informants among local community members.
- Inter-agency collaboration (Ghana and Zimbabwe).
- The Central African Republic reported a best practice of ensuring screening officers at ports and airports are trained on fraud relating poaching and illegal trade by the Program for the Conservation of Biodiversity in Central Africa (PCBAC).
- Ghana reported the establishment of a rapid response team to deal with poaching cases.

In Asia, reported best practices comprise the following:

- Use of field staff experienced in detecting and dealing with illegal activities as a best practice in and around protected areas.
- Collaboration among enforcement agencies to monitor illegal transportation of pangolins.
- Enforcement of wildlife legislation inside and outside protected areas being managed separately.
- 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.
- 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.

7.9 Collaboration and international operations

Through their notification responses, Parties identified that collaboration between agencies is essential to tackle pangolin poaching and trafficking. This includes intergovernmental collaboration as well as collaboration between government agencies, the NGO community and local people and community members. Pangolin range States in Africa and Asia reported that they have collaborated with other countries and/or international organisations (e.g., INTERPOL) to combat poaching and illegal trade in pangolins. This has involved joint operations, sharing information with other agencies and bilateral agreements between Parties. Examples include the international Cobra, Cobra II and Cobra III operations implemented in 2013, 2014 and 2015 of which pangolins were a focus; SAWEN; the signing of an Memorandum of Understanding between Viet Nam and Indonesia and Lao PDR respectively to control the illegal trade in pangolins; and collaboration between forestry agencies in Benin and Togo in order to reduce illegal trade between the countries.

8. Stockpiles and stockpile management

Nineteen Parties stated their Notification responses that they possess stockpiles of pangolin derivatives. This includes seven Asian range States (China, India, Nepal, Pakistan, the Philippines, Singapore and Thailand), nine African range States (Cameroon, Kenya, Liberia, Namibia, Senegal, Togo, Uganda, Zambia and Zimbabwe) and two non-range States (Italy and the United States) (Table 13). Stockpiles include derivatives of *Manis* spp. and *M. javanica*, *M. culionensis*, *M. gigantea*, *M. temminckii*, *M. tricuspis* and *M. tetradactyla*.

Table 13. Stockpiles of pangolin derivative products as reported by Parties in response to Notification to the Parties No. 2017/035 and 2014/059

Party	Derivative and additional information	Species
Cameroon	1794 kg scales (government held)	<i>Manis</i> 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.	<i>Manis</i> spp.
Italy	10 kg scales, derivatives (approx. 1000 units of medical derivatives.	<i>Manis</i> spp.
India	Unknown	<i>Manis</i> spp.
Kenya	1689.9 kg scales	<i>M. gigantea</i>
Liberia	50kg scales	<i>Manis</i> spp.
Namibia	170 skins	<i>M. temminckii</i>
Nepal	392.45 kg scales; 2 skins	<i>Manis</i> spp.
Nigeria	No information provided	No info. provided
Pakistan	Scales (limited confiscated consignments)	<i>Manis</i> spp.
Philippines	60 pangolins (164.69 kg)	<i>M. culionensis</i>
Senegal*	<i>M. gigantea</i> : 2x skins, scales; <i>M. tricuspis</i> : 1x skin, 1x skin and skull, 2x genitals; <i>M. tetradactyla</i> : 1x skin and skull	<i>M. gigantea</i> , <i>M. tricuspis</i> , <i>M. tetradactyla</i>
Singapore	3000 skin pieces, 1854 kg scales	<i>M. javanica</i>
Thailand	2281.75kg scales; 1 stuffed pangolin	<i>Manis</i> spp.
Togo	220.81 kg scales	<i>M. tricuspis</i>
Uganda	6500 kg scales	<i>Manis</i> 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	<i>Manis</i> spp.
Zambia	4x skins	<i>M. temminckii</i>
Zimbabwe	20x parts	<i>M. temminckii</i>

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

In response to Notification to the Parties No. 2014/059, China reported that according to Chinese law, only trade in and transport of pangolins requires permits issued by domestic authorities, while private use does not require such permission. As such, details, accurate data and information on stockpiles is not clear. However, other available information indicates that China has government-held stockpiles of pangolin scales. Although the size of these stockpiles is unknown, between 2009 and 2016, China has released, on average, approximately 26 tonnes of scales on to a legal market each year in the country from these stockpiles. These scales are permitted for clinical use in 716 designated hospitals providing they are certified (indicated by the presence of a sticker on the packaging), and for the manufacture of patented Chinese medicines. Over 200 pharmaceutical companies are licenced to produce more than 60 types of medicines containing pangolin (Vallianos 2016; China Biodiversity Conservation & Green Development Foundation 2016). However, despite these regulations uncertified pangolin scales are sold illegally and are widely available in China (e.g. Xu et al., 2016).

In addition to China, five Parties also reported that they have established stockpile management systems: Indonesia, Japan, Kenya, Nepal and the Philippines, and additional information was provided by Kenya and Japan. Kenya's stockpile inventory and management system is referred to in its Wildlife Conservation and Management Act (2013) which mandates the Kenya Wildlife Service (KWS) to annually audit trophies in possession of the government and publish the results. In Japan, from the 2nd January 2017, registration is required for the transfer, delivery or receiving of individuals or products thereof, which maintain the entire form of the individual, under the Law for the Conservation of Endangered Species of Wild Fauna and Flora (LCES). While this does not comprise a domestic stockpile management system per se, it allows Japanese authorities oversight on the number of pangolins or products thereof, which maintain the entire form of an individual, in circulation in Japan.

9. Identification and capacity building

Of the Parties that responded to Notification to the Parties No. 2017/035 (identification and capacity building didn't feature in the questionnaire relating to Notification to the Parties No. 2014/059), eight reported that current identification and capacity-building materials for pangolins are adequate in terms of complying with applicable national legislation and stockpile management. However, most stated that current identification and capacity building materials for pangolins and their derivatives are inadequate (Table 14). The most commonly reported impediment to compliance with applicable legislation and stockpile management was a lack of materials and capacity with which to identify and differentiate between different species of pangolins and their derivatives in legal and illegal trade. Based on this evidence current identification materials are inadequate and there is a clear need to develop identification manuals for the different species of pangolins and their derivatives in legal and illegal trade to assist front line enforcement staff. For some, but not all, species of pangolin, it is possible to differentiate between the species based on size, scale disposition and morphology (e.g., size, colour) and among other morphological characteristics, tail length.

Table 14. Reported adequacy of identification and capacity building materials for pangolins

Identification and capacity-building materials are adequate	Identification and capacity-building materials are inadequate
Bahrain, Denmark, Greece, Switzerland, Netherlands, France, Senegal, United States	Cambodia, Central African Republic, Côte d'Ivoire, Georgia, Indonesia, Kenya, Lao PDR, Liberia, Malaysia, Montenegro, Namibia, Nepal, Pakistan, the Philippines, Thailand, Tunisia

10. Current captive pangolin populations

Eight pangolin range States reported in their 2015 and/or 2017 questionnaire responses that pangolins are being kept in captivity in the country, as well as the United States (Table 15). China, Indonesia and Singapore were the only Parties to report pangolins being bred in captivity. China stated that any trade in, and transport of pangolins needs to be approved by the domestic wildlife management authority in order to prevent parts and derivatives from entering illegal trade. Indonesia confirmed that regulations are in place to prevent parts and derivatives from entering illegal trade (see Table 2 in Annex 2). Singapore stated that the Agri-Food and Veterinary Authority of Singapore (AVA) is kept updated by the zoo of any captive breeding of pangolins, including births and deaths.

No Parties reported that pangolins are being bred in captivity for commercial purposes but the commercial production or farming of pangolins appears to be developing. Lao PDR reported in its response to Notification to the Parties No. 2017/035 that a wildlife trading company is proposing a pangolin breeding facility in the country. According to CITES trade data (see section 6.1.2) Lao PDR also imported 250 wild-caught *M. tricuspis* and 50 wild-caught *M. gigantea* in 2012, in the case of the latter for captive-breeding purposes (source code 'B'). Similarly, China imported 200 wild-caught *M. tricuspis*, 200 wild-caught *M. tetradactyla* and 100 wild-caught *M. gigantea* from Nigeria in 2015 for captive-breeding purposes. Also Viet Nam imported 200 wild-caught *M. tricuspis* from Togo in 2012 presumably for captive-breeding purposes. The development of pangolin farming also extends to Africa. In its 2015 notification response Uganda reported that a farming licence had been issued to a private company in April 2014 and confirmed that management practices and controls are in place to prevent parts and derivatives from entering illegal trade through this facility. Further, to the knowledge of the authors, one pangolin farm has been given a licence to operate in Mozambique and unconfirmed reports suggest a pangolin farm has been established in Sudan.

The only non-range State to report having pangolins in captivity was the United States, which reported that approximately seven facilities currently house specimens of *M. tricuspis* (46 of which are wild-caught and were imported from Togo in April and November 2016). The United States reported that although there have been captive births from animals that were likely pregnant at the time of import, no cases of successful captive breeding and births have been confirmed.

10.1 Information from Other Sources

Pangolins are regarded as difficult to maintain, and especially breed in captivity due to their specialised diets and high dependence on natural ecosystems (Hua et al., 2015; Challender et al., 2012; Yang et al., 2007). Indeed, the majority of pangolins in captivity in zoological institutions today are wild born, or born in captivity, having been conceived in the wild. Based on information beyond questionnaire

responses, pangolins are currently held in captivity in at least 18 zoological institutions in Asia, Africa, Europe and North America. At least five zoological institutions hold *M. pentadactyla*, five are also known to hold *M. javanica*, one institution is known to keep *M. crassicaudata*, and approximately seven institutions are known to maintain *M. tricuspis* in captivity. A further 22 institutions (e.g., wildlife rescue centres) in Africa and Asia are also known to maintain small numbers of pangolins in captivity.

Table 15 Parties maintaining pangolins in captivity as reported in questionnaire responses

Party	Species	Purpose of maintaining pangolin in captivity
China	<i>Manis</i> spp.	Only in stage of population development, no sales have occurred (as at 2015)
Côte d'Ivoire	<i>Manis</i> spp.	As pets in private homes; exhibition in private zoos
India	<i>M. pentadactyla</i> , <i>M. crassicaudata</i>	Zoological display
Indonesia	<i>M. javanica</i>	Conservation, exhibition and breeding.
Malaysia (Sabah)	<i>Manis</i> spp.	Confiscated pangolins maintained for educational purposes
Thailand	<i>Manis</i> spp.	
Singapore	<i>M. javanica</i>	For zoological and scientific research purposes
Viet Nam	<i>M. javanica</i>	Rescue, rehabilitation and release. Some born in captivity but likely to have been conceived in the wild
United States	<i>M. tricuspis</i>	Husbandry research, breeding and conservation

11. Demand management, education and awareness-raising

11.1 Demand management

Little information was reported by Parties in their questionnaire responses on new developments regarding demand management and pangolins. However, information from other sources presented below indicates that there are activities underway to better understand, and address, demand for pangolin products. Yet, there remains a critical need for Parties and other stakeholders working on demand management to ensure activities are targeted, evidence-based, and that their impact is monitored and evaluated, to ensure that approaches can be modified where desired results are not being achieved or expanded to other locations when demonstrably successful. Such effort would also benefit from co-operation, collaboration and knowledge-sharing between stakeholders.

A number of organisations have been and are seeking to better understand demand for pangolin products in China. As examples, TRAFFIC conducted a rapid survey of physical and online markets in 2016 and although found evidence of widespread and ongoing illegal trade in pangolin scales, did report an apparently reduced market for pangolin meat in China compared to surveys carried out in 2006/7 (Xu et al., 2016). Similarly, the Wildlife Conservation Society (WCS) China programme is undertaking market monitoring and surveillance to monitor the trade and consumption of pangolins with a particular focus in Guangdong and Guangxi provinces. To complement the above research, a collaboration involving TRAFFIC, ZSL and Chinese NGO Eco-bridge Continental, is commencing research in Guangdong Province to understand more about specific triggers and drivers of pangolin consumption. These results will inform the development of a behaviour change strategy targeting key groups driving illegal trade in pangolin meat, scales and other products. USAID is also working with IFAW to undertake formative research on pangolin consumption in Beijing, Shanghai, Guangzhou, Harbin, Nanning and Kunming, to inform the development of a demand reduction campaign in 2018. Research into pangolin consumption is also being undertaken in Hainan by the University of Cambridge.

A range of activities are also taking place in Viet Nam. TRAFFIC is undertaking monitoring of physical and online markets for pangolins to develop a better understanding of the market forces driving pangolin trafficking. Save Viet Nam's Wildlife has conducted surveys of Traditional Chinese Medicine (TCM) outlets in Hanoi and Ho Chi Minh City to assess the values and uses of pangolin products and have conducted large scale quantitative research on public awareness and attitudes towards pangolin consumption. Research into the nature of demand for pangolin products in Viet Nam is being used to inform the Social and Behaviour Change Communication (SBCC) strategic approaches being adopted

under USAID's Saving Species initiative, which is being implemented by Tetra Tech Ard with TRAFFIC and WCS.

11.2 Education

Eleven Parties reported in their responses to the questionnaires that education activities are being undertaken concerning illegal international trade, poaching and other illegal activities connected with pangolins. Further details are provided below, but as with demand management, there remains a critical need for Parties and other stakeholders to measure the impact of these activities and amend them as necessary based on success or failure rates.

In Asia, education activities include workshops involving the judiciary in Malaysia (Sabah), education programmes and the appointment of honorary wildlife rangers in Malaysia (Sarawak), and the production of flyers and wildlife identification guides in Indonesia. In Nepal, school programmes have been conducted through government organisations and conservation partners during conservation days. In Africa, Kenya reported education of law enforcement agencies to better equip them to detect wildlife trafficking; Namibia reported that educational activities are conducted concerning illegal international trade in wildlife writ large; while Senegal reported training of enforcement officers, magistrates and local people on the periphery of protected areas. Montenegro reported education sessions for customs administration officials and Bulgaria reported specialised training for customs officers concerning the illegal international trade in wildlife.

11.3 Awareness-raising

Twenty-one Parties reported in their questionnaire responses that awareness-raising activities have been undertaken in-country concerning the illegal international trade regarding pangolins. Information from other sources also demonstrates efforts to raise awareness of pangolins. Key insights from these activities include those identified by the University of Hong Kong and Humane Society International that people in Hong Kong consume pangolin scales for a broad spectrum of ailments and that there is confusion over the legal status of consumption of pangolin products. However, as with demand management and education, there remains a crucial need for Parties and conservation practitioners to measure the impact of awareness-raising activities and adapt them as necessary based on successes and failures.

Awareness-raising activities reported by Parties include a mixture of pangolin-specific activities and activities relating more generally to illegal wildlife trade. In Asia, these include: wildlife roadshows in Brunei Darussalam; the distribution of flyers, posters and/or banners in Cambodia, Indonesia and Viet Nam; an awareness programme with tour operators and a campaign on the ecological and intangible

values of wildlife in Malaysia (Sabah), broad awareness-raising activities in Malaysia (Sarawak); community-based awareness programmes involving training, capacity-building and conservation days focusing on pangolins in Nepal; pangolin-focused awareness campaigns involving local communities, university students and Lahore Zoo in Pakistan; materials in airports and seaports, and radio programmes in the Philippines, and materials displayed at Wildlife Reserves Singapore sites.

In 2015, China reported sending cell phone messages to Chinese nationals in foreign countries reminding them not to 'illegally hunt, collect and use wildlife abroad, or illegally purchase, carry, mail and consign endangered species and their products, particularly ivory, rhino horn and TCM containing the ingredient of endangered species' along with information on relevant Chinese Embassies. China's CITES Management Authority staff engage directly with Chinese citizens and companies in African countries to increase public awareness and to encourage them not to purchase or transport CITES listed species without CITES permits. Other activities reported by China include distribution of brochures, leaflets and posters, and television broadcasts in customs, airlines, ports, trains and buses.

In Africa awareness-raising takes place through various mediums including television, radio and posters in Namibia; in Nigeria it takes place through engaging university students in workshops, seminars and lectures; and in In South Africa, the African Pangolin Working Group has produced posters and fliers to raise awareness of pangolins and threats posed by international trade. The organisation maintains an active online presence via its website and social media posts. In Zambia, conservation clubs are run in schools and in Zimbabwe awareness is raised through posters, fliers and newspaper articles.

The United States reported that the U.S. Fish and Wildlife Service has created a webpage highlighting activities related to pangolin trade and conservation and will be adding information for public education and outreach as needed.

11.3.1 Information from other sources

There are many other projects and activities focused on raising-awareness of pangolins at the global, regional and local level. At the global level, this includes events such as World Pangolin Day, which is celebrated every third Saturday in February and comprises a wide-range of activities in pangolin range and non-range States (e.g., panel discussions, workshops, fundraisers, scientific talks and social media activity). Pangolins are also featured as part of in the global #WildForLife campaign (<https://wildfor.life/>), a joint initiative by UN Environment, the UN Development Programme, the UN Office on Drugs and Crime and CITES, which launched in 2016. It features A-list celebrities from around the globe and aims to mobilize millions of people to make commitments and take action to end

illegal trade. As of January 2017, the campaign had garnered 3.7 million social media reactions, and generated 12,000 pledges of action.

In Asia, other activities have taken place in Bangladesh, Brunei Darussalam, Cambodia, China, India, Nepal, Singapore and Viet Nam to raise awareness of the negative impacts of pangolin trade and consumption on wild populations. Organisations involved include the Creative Conservation Alliance in Bangladesh, The Nature Conservancy-China and WildAid in China, the Small Mammals Conservation and Research Foundation (SMCRF) in Nepal, Natural Heritage Nepal, Himalayan Nature and ZSL in Nepal, and WildAid, CHANGE and Education for Nature-Vietnam (ENV) in Viet Nam. In China, the AITA Foundation is running a campaign to reduce consumption of pangolins which includes online advertisements at over 200 maternity hospitals in Beijing, Shanghai and Zhengjiang asking new mothers not to use pangolin scales.

In Africa, awareness activities have taken place in, *inter alia*, Cameroon, DRC, Ghana and Nigeria. In Cameroon, the Ministry of Forests and Wildlife (MINFOF), NGOs (primarily ZSL and WCS) have undertaken a suite of awareness-raising activities, many of which were supported or facilitated by the US Fish and Wildlife Service and the US Embassy in Yaoundé. In the DRC, NGO Synergie Rurale – Action Paysanne (SyR-AP) has organised a small-scale awareness campaign focusing on giant pangolins in the territorial district of Batere which reinforces traditional taboos on the killing of giant pangolins. In Ghana, the Kwame Nkrumah University of Science & Technology, the Ghana Wildlife Division and the Council for Scientific and Industrial Research (CSIR) Forestry Research Institute of Ghana is working to raise awareness of the status of pangolins and the need to conserve them in the communities of Atewa Range Forest Eco-zone in Ghana which is at hunters and African medicine practitioners. In Nigeria, a Pangolin Conservation Working Group was inaugurated in 2016 and the group engages with school children about the plight of pangolins via television and radio talk shows.

12. Ongoing and needed conservation actions

Pangolins have received little conservation attention and investment historically. This has started to change in recent years due to the growing profile of the species linked to high levels of illegal trade. However, while there are a range of ongoing conservation-related activities including biological, ecological and trade focused research (see section 5 and citations within), law enforcement efforts (see sections 6.2 and 7.3), activities to raise awareness of, and educate people about pangolins and actions to better understand and address demand for pangolin products traded illegally (see section 11), there are a number of actions that need to be implemented urgently to directly conserve, or support the conservation of pangolins. Notwithstanding recommended actions (see section 12.1) key actions are presented below.

12.1 Conservation Planning

Linked with little conservation attention historically, there has been an absence of conservation planning for pangolins until very recently. The IUCN SSC Pangolin Specialist Group published the first global pangolin conservation action plan, '[Scaling up Pangolin Conservation](#)' in 2014 (Challender et al., 2014c) which built on recommendations made at the IUCN SSC Pangolin Specialist Group's Conservation Conference in 2013 and the 2008 TRAFFIC workshop on the trade and conservation of pangolins native to South and Southeast Asia. This first, global action plan outlines priorities for pangolin conservation in four main categories: conservation research, protecting pangolin strongholds, policy recommendations, and demand reduction, behaviour change and awareness-raising, and these actions remain critical to the conservation of pangolins globally, and are intended as a high-level guide for the development of more detailed regional and national conservation strategies.

In addition, the governments of the United States and Viet Nam jointly hosted the First Pangolin Range States meeting in Da Nang, Viet Nam, in 2015. The meeting was attended by 95 participants, including 56 representatives from 29 African and Asian range States and its purpose was to foster collaboration between pangolin range States, consuming countries, and other stakeholders, share information on pangolin status and trade and develop a suite of recommendations to protect pangolins from overexploitation as a result of international trade. The recommendations include addressing gaps in knowledge of pangolin biology and ecology, legal and illegal harvest and trade, care and husbandry of pangolins in captivity, scientific assessment under CITES and effective law enforcement. The full suite of recommendations was presented as a unified pangolin conservation action plan in [SC66 Doc. 50.2](#).

Despite these efforts, there remains a critical need to guide future investment in, and conservation actions for pangolins at the regional and national level. This can arguably best be achieved through the development and implementation of regional and national pangolin conservation strategies. In this

regard, a Regional Sunda Pangolin Conservation Planning Workshop was held in June 2017, organised jointly by the IUCN SSC Pangolin Specialist Group, IUCN SSC Asian Species Action Partnership (ASAP) and Wildlife Reserves Singapore. The workshop was attended by more than 50 representatives from 16 countries, including most range States for this species. The aim of the workshop was to develop a regional conservation strategy for *M. javanica* and this strategy is in the process of being finalised. Conservation priorities include site-based protection, which includes engaging local communities in pangolin conservation efforts, combatting trafficking, strengthening legal policies, and addressing demand. Similarly, national conservation strategies are currently in development for *M. crassicaudata* and *M. pentadactyla* in Nepal and *M. javanica* in Singapore, following workshops held in 2016 and 2017 respectively. Plans are also underway to hold a participatory workshop to develop a national conservation strategy for pangolins in Viet Nam building on recommendations from the regional workshop. The Agriculture, Fisheries and Conservation Department (AFCD) in Hong Kong SAR is also planning to develop a species action plan for *M. pentadactyla* in Hong Kong SAR. However, there remains a vital need to develop other regional and national conservation strategies to guide the Parties and other stakeholders on actions to conserve pangolins.

12.2 Monitoring methods

Developing robust monitoring methods for accurately and reliably assessing abundance is a major conservation priority for pangolins. Little is known in quantitative terms about the abundance of pangolins across their ranges, the size of areas required to sustain viable populations of the different species, the most suitable habitats for the different species, or how different exploitation rates affect the status of populations. Although a range of primary and secondary methods for monitoring pangolins have been trialled, including using local ecological knowledge (Nash et al., 2016), burrow counts (Wu et al., 2002b), nocturnal surveys, camera trapping (Pabasara 2016) and sign surveys and transects (Akpona et al., 2008; Mahmood et al., 2014), there remains a need to develop monitoring methods for the different species of pangolins that can be field tested and evaluated to ensure they are robust, accurate and reliable and can be integrated in to conservation management.

12.3 Trade monitoring

There are two key actions associated with trade monitoring. First, is the development of a pangolin trade resource kit. As discussed in section 9, there is evidently a need to better support frontline enforcement staff in tackling illegal trade in pangolins through the development of identification materials that provide details on the morphological differences between the eight species of pangolin and how to correctly identify them. Similarly, there continue to be seizures of very large volumes of pangolin scales in Asia and Africa. However, there is currently no standard protocol for sampling these scales in order to determine through forensic methods the species of pangolin involved and their

geographic origins. The development of such methods and guidance on how to apply them would assist law enforcement personnel and associated scientists in determining the species, and subsequently origins of pangolins in illegal trade. Equally, there is a lack of guidance on the immediate and long-term disposal of live animals (e.g., decision trees based on CITES Resolutions, contact details of experts and/or rescue centres, advice on procedures), and the absence of a list of suitable housing facilities for long-term placement of live pangolins. These needs could be met through the development of a pangolin trade resource kit with the following components:

- identification materials for pangolins and their derivatives in trade for frontline enforcement staff;
- standardised protocols for sampling seizures of large volumes of pangolins scales;
- guidance on the immediate and long-term placement of live animals; and
- a catalogue of suitable housing facilities for the long-term placement of live pangolins.

Second, is species specific analyses of pangolins and their derivatives in illegal trade to inform CITES decision-making. Notwithstanding analyses on levels of illegal trade presented in section 6.2, existing research indicates that the number of pangolins trafficked since around the year 2000 exceeds these estimates (e.g., Challender et al., 2015; Takandjandji & Sawitri 2016; IUCN SSC Pangolin Specialist Group 2016). Regular analyses of illegal trade based on annual illegal trade reports outlined in Res. Conf. 11.17 (Rev. CoP17) combined with any other available data on illegal pangolin trade would allow comprehensive assessment of levels of, and dynamics of, pangolin trafficking in order to inform CITES decision-making.

12.4 Site-based protection and local community engagement

Collectively, pangolins have a broad distribution in Asia and Africa and they occur within numerous protected areas on each continent as well as outside protected areas and reserves. However, their needs are rarely explicitly incorporated into conservation management. Although a preliminary assessment of potential priority sites for pangolins, or strongholds, has been completed by the IUCN SSC Pangolin Specialist Group and by representative of range States at the First Pangolin Ranges States meeting in Da Nang, Viet Nam in 2015, there remains a need to more comprehensively assess and determine priority sites at which to concentrate pangolin conservation efforts as part of effective protected area management. This should include effective law enforcement, for example in the south-eastern Western Forest Complex (sWEFCOM) in Thailand, data on pangolins are being collected and used to inform patrol effort as part of the SMART approach to protected area management. Equally important is the need to work with local communities at priority sites to achieve their genuine, long-term buy-in to pangolin conservation. This will realistically necessitate context-specific actions and solutions across sites and will likely best be achieved by heeding lessons learnt to date about the role local communities

can be play in combatting wildlife crime and supporting long-term conservation efforts (e.g., Cooney et al., 2016).

12.5 Captive Management

The recent emergence of pangolin farming in both Asia and Africa is a potential conservation concern and warrants further investigation to assess whether it offers a potential supply-side conservation solution for pangolins or otherwise may exacerbate overexploitation of, and illegal trade in, wild pangolins.

13. References

- Actman, J. (2016). Four tons of plastic discovered to be smuggle pangolin scales. Available at: <http://news.nationalgeographic.com/2016/06/pangolin-scales-smuggling-hong-kong/>. Accessed 7 September 2017.
- Anon (2015). 2000 kg of pangolin scales seized in Hong Kong: Available at: http://news.xinhuanet.com/english/2015-03/20/c_134084794.htm. Accessed 18 August 2017.
- Anon. (2016a). CITES CoP17 Prop. 12. Transfer of *Manis tetradactyla*, *M. tricuspis*, *M. gigantea*, and *M. temminckii* from CITES Appendix II to Appendix I. CITES, Geneva Switzerland.
- Anon (2016b). Shipped from Nigeria – China in biggest-ever pangolin scale seizure: reports. Available at: <http://clubofmozambique.com/news/shipped-nigeria-china-biggest-ever-pangolin-scale-seizure-reports/>. Accessed 18 August 2017.
- Anon. (2017a). Current Status of the Indian Pangolin in Chiplun taluka of Ratnagiri District, Maharashtra, Indian. Unpublished report.
- Anon (2017b). Malaysia seizes more than \$2 million in pangolin scales in largest haul. Available at: <http://uk.reuters.com/article/us-malaysia-pangolins-idUKKBN1840S7>. Accessed 18 August 2017.
- Anon (2017c). 3 tonnes of pangolin scales seized by Ivorian authorities. Available at: <http://www.africanews.com/2017/07/29/3-tonnes-of-pangolin-scales-seized-by-ivorian-authorities//>. Accessed 18 August 2017.
- Anon (2017d). Customs seizes record 8,000kg pangolin scales worth RM100m in Sabah. Available at: <http://www.themalaymailonline.com/malaysia/article/customs-seizes-record-8000kg-pangolin-scales-worth-rm100m-in-sabah#UkfigxOhp7oFtpxM.97>. Accessed 18 August 2017.
- Akpona, H.A., Djagoun, C.A.M.S., Sinsin, B. (2008). Ecology and ethnozoology of the three-cusped pangolin *Manis tricuspis* (Mammalia, Pholidota) in the Lama forest reserve, Benin. *Mammalia* 72: 198-202.
- Angelici, F.M., Grimod, I., Politano, E. (1999). Mammals of the Eastern Niger Delta (Rivers and Bayelsa States, Nigeria): An environment affected by a gas-pipeline. *Folia Zoologica* 48: 249-264.

Azhar, B., Lindenmayer, D., Wood, J., Fischer, J., Manning, A., McElhinny, C., Zakaria, M. (2013). Contribution of illegal hunting, culling of pest species, road accidents and feral dogs to biodiversity loss in established oil-palm landscapes. *Wildlife Research* 40: 1-9.

Baillie, J., Challender, D., Kaspal, P., Khatiwada, A., Mohapatra, R. & Nash, H. (2014). *Manis crassicaudata*. The IUCN Red List of Threatened Species 2014: e.T12761A45221874. <http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T12761A45221874.en>. Downloaded on **15 June 2017**.

Baral, H.S., Shah, K.B. (2008). *Wild Mammals of Nepal*. Himalayan Nature, Kathmandu.

Bayron, A. (2014). Trade Dynamics of Palawan Pangolin, *Manis culionensis*. Undergraduate thesis. Western Philippines University, Palawan, Philippines.

Boakye, M.K., Pietersen, D.W., Kotze, A., Dalton, D.L., Jansen, R. (2015). Knowledge and Uses of African Pangolins as a source of Traditional Medicine in Ghana. *PLoS ONE* 10(1): e0117199. doi:10.1371/journal.pone.0117199.

Boakye, M.K., Kotzé, A., Dalton, D.E., Jansen, R. (2016a). Unravelling the Pangolin Bushmeat Commodity Chain and the Extend of Trade in Ghana. *Human Ecology*. DOI 10.1007/s10745-016-9813-1.

Boakye, M.K., Pietersen, D.W., Kotze, A., Dalton, D.L., Jansen, R. (2016b). Ethnomedicinal use of African pangolins by traditional medical practitioners in Sierra Leone. *Journal of Ethnobiology and Ethnomedicine*. 10:76.

Bräutigam, A., Howes, J., Humphreys, T., Hutton, J. (1994). Recent information on the status and utilization of African pangolins. *TRAFFIC Bulletin* 15: 15-22.

Chakkaravarthy, Q. A. (2012). Research and conservation needs of the Indian pangolin (*Manis crassicaudata*). Proceedings of Third Seminar on Small Mammals Conservation Issues, 2012. 50-55.

Challender, DWS., Nguyen Van, T., Jones, M. and May, L. (2012). Time-budgets and activity patterns of captive Sunda pangolins (*Manis javanica*). *Zoo Biology*, **31** (2), 206-218.

Challender, D.W.S., Hywood, L. (2012). African pangolins under increased pressure from poaching and international trade. *TRAFFIC Bulletin* 24, 53-55.

Challender, D., Baillie, J., Ades, G., Kaspal, P., Chan, B., Khatiwada, A., Xu, L., Chin, S., KC, R., Nash, H., Hsieh, H. (2014a). *Manis pentadactyla*. The IUCN Red List of Threatened Species (2014a): e.T12764A45222544. <http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T12764A45222544.en>. Downloaded on 13 June 2017.

Challender, D., Nguyen Van, T., Shepherd, C., Krishnasamy, K., Wang, A., Lee, B., Panjang, E., Fletcher, L., Heng, S., Seah Han Ming, J., Olsson, A., Nguyen The Truong, A., Nguyen Van, Q., Chung, Y. (2014b). *Manis javanica*. The IUCN Red List of Threatened Species 2014: e.T12763A45222303. <http://dx.doi.org/10.2305/IUCN.UK.2014-2.RLTS.T12763A45222303.en>. Downloaded on 13 June 2017.

Challender, DWS., Waterman, C., Baillie, JEM. (eds). (2014c). Scaling up pangolin conservation. IUCN SSC Pangolin Specialist Group Conservation Action Plan. Zoological Society of London. London, UK.

Challender, DWS., Harrop, S.R., MacMillan, DC. (2015). Understanding markets to conserve trade threatened species in CITES. *Biological Conservation* 187:249– 259.

Chao, J-T., E.H. Tsao, K. Traylor-Holzer, D. Reed and K. Leus (eds.). (2005). *Formosan Pangolin Population and Habitat Viability Assessment: Final Report*. IUCN/SSC Conservation Breeding Specialist Group, Apple Valley, MN.

China Biodiversity Conservation & Green Development Foundation (2016). An Overview of Pangolin Data: when will the overexploitation of the pangolin end? China Biodiversity Conservation and Green Development Foundation, China.

CITES (2000). Prop. 11.13 Transfer of *Manis crassicaudata*, *M. pentadactyla*, *M. javanica* from Appendix II to Appendix I. CITES, Geneva, Switzerland.

Chong, J.L., Hafiz, M.S., Marina, H. (2017). Conservation of the Sunda pangolin (*Manis javanica*) in Peninsular Malaysia: Important findings and conclusions. *Malayan Nature Journal* 68(4), 161-171.

Cooney, R., Brunner, J., Roe, D., Compton, J., Laursen, J. (2016). Beyond Enforcement: Engaging Communities in Combatting Illegal Wildlife Trade. Regional workshop for Southeast Asia, with a

focus on the lower Mekong Basin. Hanoi, Vietnam, 15-16 November 2016. Available at:
https://www.iucn.org/sites/dev/files/be_hanoi_communique.pdf.

Corbet, G.B., Hill, J.E. (1992). *Mammals of the Indo-Malayan Region: a Systematic Review*. Oxford University Press, Oxford, UK.

Esselstyn, J.A., Widmann, P., Heaney, L.R. (2004). The mammals of Palawan Island, Philippines. *Proceedings of the Biological Society of Washington* 117(3): 271-302.

Fa, J.E., Seymour, S., Dupain, J., Amin, R., Albrechtsen, L. and Macdonald, D. (2006). Getting to grips with the magnitude of exploitation: Bushmeat in the Cross-Sanaga rivers region, Nigeria and Cameroon. *Biological Conservation* 129: 497-510.

Fletcher, L. (2016). Developed a strategy for pangolin conservation in Brunei: Refining guidelines for the release of confiscated animals and gathering baseline data. Unpublished report.

Gaubert, P., Antunes, A. (2005). Assessing the taxonomic status of the Palawan pangolin *Manis culionensis* (Pholidota) using discrete morphological characters. *Journal of Mammalogy* 86: 1068–1074.

Gaudin, T.J., Emry, R.J., Wible, J.R. (2009). The Phylogeny of Living and Extinct Pangolins (Mammalia, Pholidota) and Associated Taxa: A Morphology Based Analysis. *Journal of Mammalian Evolution* 16: 235-305.

Gomez, L., Leupen, B.T.C., Hwa, T.K. (2016). The trade of African pangolins to Asia: a brief case study of pangolin shipments from Nigeria. *TRAFFIC Bulletin* 28 (1) 3–5.

Grubb, P., Jones, T.S., Davies, A.G., Edberg, E., Starin, E.D., Hill, J.E. (1998). *Mammals of Ghana, Sierra Leone and the Gambia*. Trendrine Press, Zennor, St Ives, Cornwall, UK.

Heath, M. (1995). *Manis pentadactyla*. *Mammalian Species* 414, 1-6.

Heaney, L.R., Balete, D.S., Dollar, M.L., Alcala, A.C., Dans, A.T.L., Gonzales, P.C., Ingle, N.R., Lepiten, M.V., Oliver, W.L.R., Ong, P.S., Rickart, E.A., Tabaranza Jr., B.R., Uzzurum, R.C.B. (1998). A synopsis of the mammalian fauna of the Philippine Islands. *Fieldiana: Zoology (New Series)* 88: 1–61.

Hoffmann, M., Cronin, D.T., Hearn, G., Butynski, T.M., Do Linh San, E. (2015). A review of evidence for the presence of two-spotted Palm Civet *Nandinia binotata* and four other small carnivores on Bioko, Equatorial Guinea. *Small Carnivore Conservation* 52&53: 13-23.

Hua, L., Gong, S., Wang, F., Li, W., Ge, Y., Li, X., Hou, F. (2015). Captive breeding of pangolins: current status, problems and future prospects. *ZooKeys* 507: 99-114.

Ickes, K. and Thomas, S.C. (2003). Native, wild pigs (*Sus scrofa*) at Pasoh and their impacts on the plant community in T. Okuda. In: N. Manokaran, Y. Matsumoto, K. Niiyama, S. C. Thomas and P. S. Ashton (eds), *Pasoh: Ecology and Natural History of a Southeast Asian Lowland Tropical Rain Forest*.

Ingram, D.J., Coad, L.M., Abernethy, K., Maisels, F., Stokes, E., Bobo, K.S., Breuer, T., Gandiwa, E., Ghiurghi, A., Greengrass, E., Holmern, T., Kamgaing, T.O.W., Ndong Obiang, A.M., Poulsen, J.R. & Schleicher, J. (2017). Assessing Africa-wide pangolin exploitation by scaling local data (Forthcoming/Available Online), Conservation Letters.

IUCN SSC Pangolin Specialist Group (2016). The status, trade and conservation of pangolins (*Manis* spp.). CITES CoP17 Inf. 59. Prepared by the IUCN SSC Pangolin Specialist Group. CITES, Geneva, Switzerland.

Jnawali, S.R., Baral, H.S., Lee, S., Acharya, K.P., Upadhyay, G.P., Pandey, M., Shrestha, R., Joshi, D., Lamichhane, B.R., Griffiths, J., Khatiwada, A.P., Subedi, N., Amin, R. (2011). The Status of Nepal's Mammals: The National Red List Series. The Status of Nepal Mammals: The National Red List Series, Department of National Parks and Wildlife Conservation, Kathmandu, Nepal.

Karawita, K., Perera, P. & Pabasara, M. (2016). Indian pangolin (*Manis crassicaudata*) in Yagirala Forest Reserve: Ethnozoology and implications for conservation. *Proceedings of 21st International Forestry and Environment Symposium, 2016, Sri Lanka*.

Kingdon, J.S. et al., (2013) (eds), The Mammals of Africa. Volume 5: Carnivores, Pangolins, Equids, Rhinoceroses, Bloomsbury Publishing, London.

Kingdon, J.S. and Hoffmann, M. (2013). *Phataginus tricuspis* White-bellied Pangolin. In: J.S. Kingdon and M. Hoffmann (eds), The Mammals of Africa. Volume 5: Carnivores, Pangolins, Equids, Rhinoceroses, Bloomsbury Publishing, London.

Kingdon, J.S., Hoffmann, M. and Hoyt, R. (2013). *Smutsia gigantea* Giant Ground Pangolin. In: J.S. Kingdon and M. Hoffmann (eds), *The Mammals of Africa. Volume 5: Carnivores, Pangolins, Equids, Rhinoceroses*, Bloomsbury Publishing, London.

Kityo, R., Prinsloo, S., Ayebare, S., Plumtree, A., Rwetsiba, A., Sadic, W., Sebuliba, S., Tushabe, H. (2016). *Nationally Threatened Species of Uganda*.

Kümpel, N.F. (2006). *Incentives for sustainable hunting of bushmeat in Rio Muni, Equatorial Guinea*. Ph.D. Thesis, Imperial College London. London. UK.

Lagrada, L.S.A. (2012). *Population density, distribution and habitat preferences of the Palawan Pangolin (Manis culionensis, de Elera 1915)*. University of the Philippines Los Banos, Philippines.

Lagrada, L., Schoppe, S. & Challender, D. (2014). *Manis culionensis*. The IUCN Red List of Threatened Species 2014:e.T136497A45223365.

<http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T136497A45223365.en>. Downloaded on 13 June 2017.

Lekagul, B. and McNeely, J.A. (1977). *Mammals of Thailand*. Association for the Conservation of Wildlife, Bangkok, Thailand.

Li, Z. et al. (2010). *General Status of Pangolins on Conservation and Population in China*. *Bulletin of Biology*, 45 (9):1-4 (in Chinese).

Lindsey, P.A., Balme, G., Becker, M., Begg, C., Bento, C., Bocchino, C., Dickman, A., Diggle, R. W., Eves, H., Henschel, P., Lewis, D., Marnewick, K., Mattheus, J., Weldon McNutt, J., McRobb, R., Midlane, N., Milanzi, J., Morley, R., Murphree, M., Opyene, V., Phadima, J., Purchase, G., Rentsch, D., Roche, C., Shaw, J., Westhuizen, H.V.D., Vliet, N.V., Zisadza-Gandiwa, P. (2013). *The bushmeat trade in African savannas: impacts, drivers, and possible solutions*. *Biological Conservation* 160: 80–96.

Lo, C. (2014). *Pangolin scales worth HK 17m found hidden in shipments from Africa*. Available at: <http://www.scmp.com/news/hong-kong/article/1534140/pangolin-scales-worth-hk17m-found-hidden-shipments-africa>. Accessed 18 August 2017.

Lo, C. (2017). *More than seven tonnes of suspected pangolin scales uncovered at Hong Kong container terminal*. Available at: <http://www.scmp.com/news/hong-kong/law->

crime/article/2096205/more-seven-tonnes-suspected-pangolin-scales-uncovered-hong. Accessed 18 August 2017

MacMillan, D.C., Nguyen, A. Q. (2013). Factors influencing the illegal taking of wildlife by trapping and snaring among ethnic communities in Viet Nam. *Oryx First View* 1-9.

Mahmood, T., Hussain, R., Irshad, N., Akrim, F., Nadeem, M. S. (2012). Illegal mass killing of Indian Pangolin (*Manis crassicaudata*) in potohar region, pakistan. *Pakistan Journal of Zoology*, 44, 1457-1461.

Mahmood, T., Akrim, F., Irshad, N., Hussain, R., Fatima, H., Andleeb, S., Aihetasham, A. (2017). Distribution and illegal killing of the Endangered Indian pangolin *Manis crassicaudata* on the Potohar Plateau, Pakistan. *Oryx* 1-6.

Mishra, S., Panda, S. (2012). *Distribution of Indian Pangolin Manis crassicaudata Gray (Pholidota, Manidae) in Orissa: A Rescue Perspective*. Chrioptera, Rodentia, Insectivora & Scadentia Conservation and Information Networks of South Asia, Small Mammal Mail.

Mohapatra, R.K., Panda, S., Acharjyo, L.N., Nair, M.V., Challender, D.W.S. (2015). A note on the illegal trade and use of pangolin body parts in India. *TRAFFIC Bulletin* 27 (1) 33-40.

Moo, S.S.B., Froese, G.Z.L., Gray, T.N.E. (2017). First structured camera-trap surveys in Karen State, Myanmar, reveal high diversity of globally threatened mammals. *Oryx* 1-7.

Mugume, S., Isabirye-Basuta, G., Otali, E. Reyna-Hurtado, R., Chapman C.A. (2015). How do human activities influence the status and distribution of terrestrial mammals in forest reserves? *Journal of Mammalogy*, 96(5): 998-1004.

Nash, H.C., Wong, M.H.G., Turvey, S.T. (2016). Using local ecological knowledge to determine status and threats of the Critically Endangered Chinese pangolin (*Manis pentadactyla*) in Hainan, China. *Biological Conservation* 196: 189-195.

Nabhitabhata, J., Chan-ard, T. (2005). Thailand Red Data: Mammals, Reptiles and Amphibians. Office of Natural Resources and Environmental Policy and Planning, Bangkok, Thailand. Pp.234.

Newton, P. (2007). Potential applications of hunters' knowledge for the conservation of pangolins in Viet Nam. M.Sc. Thesis, University of East Anglia.

Newton, P., Nguyen Van, T., Robertson, S., Bell, D. (2008). Pangolins in Peril: using local hunters' knowledge to conserve elusive species in Viet Nam. *Endangered Species Research* 6(41-53).

Nooren, H., Claridge, G. (2001). Wildlife trade in Laos: the End of the Game. Netherlands Committee for IUCN, Amsterdam, the Netherlands.

Norris, K., Assase, A., Collen, B., Gockowksi, J., Mason, J., Phalan, B., Wade, A. (2010). Biodiversity in a forest agriculture mosaic – the changing face of West African rainforests. *Biological Conservation*, 143:2341-2350.

Numata, S., Okuda, T., Sugimoto, T., Nishimura, S., Yoshida, K., Quah EngSeng, Yasuda, M., Muangkhum, K., Nur Supardi, M.N. (2005). Camera-trapping: a non-invasive approach as an additional tool in the study of mammals in Pasoh Forest Reserve and adjacent fragmented areas in Peninsular Malaysia. *Malayan Nature Journal* 57(1): 39-45.

Nuwer, R., Bell, D. (2013). Identifying and quantifying the threats to biodiversity in the U Minh peat swamp forests of the Mekong Delta, Viet Nam. *Oryx FirstView*: 1-7.

Pabasara, M., Perera, P., Dayawansa, N. (2015). A preliminary investigation of the habitat selection of Indian Pangolin (*Manis crassicaudata*) in a tropical lowland forest in south-west Sri Lanka. *Proceedings of 20th International Forestry and Environment Symposium, 2015, Sri Lanka*.

Pabasara, G. (2016). Assessment of the abundance and habitat preference of Indian pangolin (*Manis crassicaudata*) in Yagirala forest reserve; a tropical lowland forest in south-west Sri Lanka.

Pantel, S., Anak, N.A. (2010). A preliminary assessment of the pangolin trade in Sabah. TRAFFIC Southeast Asia, Petaling Jaya, Selangor, Malaysia.

Pagés, E. (1975). Etude éco-éthologique de *Manis tricuspis* par radio-tracking. *Mammalia* 39: 613-641.

Perera, P.K.P., Karawita, K.V.D.H.R., Pabasara, M.G.T. (2017). Pangolins (*Manis crassicaudata*) in Sri Lanka: A Review of Current Knowledge, Threats and Research Priorities. *Journal of Tropical Forestry and Environment*. Vol. 7 (1), 1-14.

Pietersen, D., Jansen, R., Swart, J., Kotze, A. (2016). A conservation assessment of *Smutsia temminckii*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

Pietersen, D.W., McKechnie, A.E., Jansen, R. (2014a). Home range, habitat selection and activity patterns of an arid-zone population of Temminck's ground pangolins, *Smutsia temminckii*. *African Zoology*, 49(2):265-276.

Pietersen, D., Waterman, C., Hywood, L., Rankin, P. & Soewu, D. (2014b). *Smutsia temminckii*. The IUCN Red List of Threatened Species 2014: e.T12765A45222717. <http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T12765A45222717.en>. Downloaded on **24 October 2016**.

Pocock, R.I. (1924). The External Characters of the Pangolins (Manidae). *Proceedings of Zoological Society of London*, Vol. 94, pp. 707–723, 1924.

Roberts, T.J. (1977). *The Mammals of Pakistan*. Ernest Benn, London, UK.

SATCM (1996). Guangxi Province: Cross-Border Trade Prices for Pangolins Rise Further. *Zhongyaocai* (State Administration of Traditional Chinese Medicine) **19** (4).

Schoppe, S. and Cruz, R. (2009). The Palawan Pangolin *Manis culionensis*. In Pantel, S. and Yun, C.S. (ed). *Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia, 30 June - 2 July 2008, Singapore Zoo, Singapore. TRAFFIC Southeast Asia, Petaling Jaya, Selangor, Malaysia*.

Schoppe, S, Alvarado, D. (2015). Conservation needs of the Palawan Pangolin *Manis culionensis* – Phase II (Extension) – Final scientific and financial report submitted to WRS, May 2015, 36pp.

Schulte-Herbrüggen, B., Cowlshaw, G., Homewood, K., Rowcliffe, J. M. (2013). The importance of bushmeat in the livelihoods of west African cash-crop farmers living in a faunally-depleted landscape. *PLoS ONE*, 8(8): 1–13.

Semiadi, G., Darnaedi, D., Arief, A.J. (2008). Sunda Pangolin *Manis javanica* Conservation in Indonesia: Status and Problems. In: Pantel., S., Chin, S.Y. (2008). *Proceedings of the Workshop on*

Trade and Conservation of Pangolins Native to South and Southeast Asia. 30 June – 2nd July, 2008. Singapore, Singapore.

Singapore National Parks (2017). Pangolins. Available at: <https://www.nparks.gov.sg/gardens-parks-and-nature/dos-and-donts/animal-advisories/pangolins>. Accessed **18 August 2017**.

Sinsin, B. and Hessou, C. (2004). Evaluation de la diversité biologique des zones d'intervention du Programme de Gestion des Forêts et des Ressources Naturelles, PGFTR. 2004. List rouge de l'IUCN pour le Bénin.

Smith, A.T., Xie, Y. (2013). Mammals of China. Princeton University Press. New York, USA.

Sodeinde, O.A., Adepipe, S.R. (1994). Pangolins in south-west Nigeria: current status and prognosis. *Oryx* 28: 43-50.

Soewu, D.A., Ayodele, I.A. (2009). Utilisation of Pangolin (*Manis* spp.) in traditional Yorubic medicine in Ijebu province, Ogun State, Nigeria. *Journal of Ethnobiology and Ethnomedicine* 5: 39-49.

Soewu, D.A., Adekanola, T.A. (2011). Traditional Medical Knowledge and Perceptions of Pangolins (*Manis* spp) among the Awori People, Southwestern Nigeria. *Journal of Ethnobiology and Ethnomedicine*, 7:25.

Soewu, D.A., Sodeinde, O.A. (2015). Utilisation of pangolins in Africa: Fuelling factors, diversity of uses and sustainability. *International Journal of Biodiversity and Conservation* 7(1) 1-10.

Srinivasulu, C., Srinivasulu, B. (2012). *South Asian Mammals. Their Diversity, Distribution, and Status*. Springer, New York.

Swart, J.M. (2013). *Smutsia temminckii*. In: J. S. Kingdon and M. Hoffmann (eds), *The Mammals of Africa. Volume 5: Carnivores, Pangolins, Equids, Rhinoceroses*, Bloomsbury Publishing, London.

Takandjandji, M., Sawitri, R. (2016). Analisis Penangkapan Dan Perdagangan Trenggiling Jawa (*Manis javanica* Desmarest, 1822) Di Indonesia. *Jurnal Analisis Kebijakan* Vol. 13 No. 2, Agustus 2016: 85-101.

Trageser, S.J., Ghose, A., Faisal, M., Mro, P., Mro, P., Rahman, S.C. (2017). Pangolin distribution and conservation status in Bangladesh. *PLoS ONE* 12(4): e0175450. <https://doi.org/10.1371/journal.pone.0175450>.

Tikader, B.K. (1983). *Threatened Animals of India*. Zoological Survey of India, Calcutta, India.

Tikki Hywood Trust (2013). How many animals make up a ton of scales? Tikki Hywood Trust, Harare, Zimbabwe.

Vallianos, C. (2016). Pangolin on the brink. WildAid, San Francisco, USA. Pp.1-36.

Waterman, C., Pietersen, D., Hywood, L., Rankin, P. & Soewu, D. (2014a). *Smutsia gigantea*. The IUCN Red List of Threatened Species 2014: e.T12762A45222061. <http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T12762A45222061.en>. Downloaded on **15 June 2017**.

Waterman, C., Pietersen, D., Soewu, D., Hywood, L. & Rankin, P. (2014b). *Phataginus tetradactyla*. The IUCN Red List of Threatened Species 2014: e.T12766A45222929. <http://dx.doi.org/10.2305/IUCN.UK.2014-2.RLTS.T12766A45222929.en>. Downloaded on 13 June 2017.

Waterman, C., Pietersen, D., Soewu, D., Hywood, L. & Rankin, P. (2014c). *Phataginus tricuspis*. The IUCN Red List of Threatened Species 2014: e.T12767A45223135. <http://dx.doi.org/10.2305/IUCN.UK.20142.RLTS.T12767A45223135.en>. Downloaded on **15 June 2017**.

Wilson, D.E., Helgen, K.M., Chin, S.Y., Gimán B. (2006). Small mammal survey at two sites in planted forest zone, Bintulu, Sarawak. *Malayan Nature Journal* 52(2): 165-187.

Wilson, D.E., Reeder, D.M. (ed.) (2005): *Mammal Species of the World. A Taxonomic and Geographic Reference*. Third edition, Vol. 1-2, xxxv + 2142 pp. Baltimore (John Hopkins University Press).

Wirdateti., Dan, Y., Semiadi, G. (2013). Sebaran dan Habitat Trenggiling (*Manis javanica* Desmarest, 1822) di Wilayah Kabupaten Tanggamus dan Lampung Barat, Provinsi. *Prosiding Seminar Nasional Biodiversitas* Vol.2 Hal: 181-186.

- Wu, S.B., Ma, G.Z., Tang, M., Chen, H., Liu, N.F. (2002a). The status and conservation strategy of pangolin resource in China. *Journal of Natural Resources*. Vol. 12 (2), 174-180.
- Wu, S.B., Ma, G., Tang, M., Chen, H., Xu, Z., Liu, N. (2002b). The population and density of pangolin Dawuling Natural Reserve and the number of pangolins resource in Guangdong Province. *Acta Theriologica Sinica* **22** (4) 270-276.
- Wu, S.B., Liu, N., Zhang, Y., Ma, G.Z. (2004). Assessment of threatened status of Chinese Pangolin (*Manis pentadactyla*). *Chinese Journal of Applied Environmental Biology* **10**, 456-461.
- Wu, S.B., Wang, Y-X., Feng, Q. (2005). A new record of Mammalia in China – *Manis javanica*. *Acta Zootaxonomica Sinica* 30 (2), 440-443.
- Xu, L. Guan, J., Lau, W., Xiao, Y. (2016). An Overview of Pangolin Trade in China. *TRAFFIC Briefing Paper*. TRAFFIC China, Beijing, China.
- Yang, C.W., Chen, S., Chang, C-Y., Lin, M.F., Block, E., Lorentsen, R., Chin, J.S.C., Dierenfeld, E.S. (2007). History and Dietary Husbandry of Pangolins in Captivity. *Zoo Biology* **26** 223-230.
- Zhang, Y. (2008). Conservation and Trade Control of Pangolins in China. Pantel, S., Chin, S.Y. (2008). *Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia. 30 June – 2nd July, 2008. Singapore, Singapore*. Pp.66–74.
- Zhang, S., Zheng, F., Li, J., Bao, Q., Lai, J., Cheng, H. (2017). Monitoring diversity of ground-dwelling birds and mammals in Wuyanling National Natrue Reserve using infrared camera traps. *Biodiversity Science* 25(4), 427-429.
- Zhigang, J., Ma, Y., Wu, Y., Wang, Y., Zhou, K., Liu, S., Feng, Z. (2015). China's Mammal Diversity and Geographic Distribution.

Annex 1 Methods used to estimate number of pangolins in trade

Many parts and derivatives of pangolins are found in legal and illegal trade. For the purposes of this report, we adapted conservation parameters in the published scientific literature to estimate the number of pangolins in legal trade where it involved volumes of scales only. This calculation is not done by UN Environment World Conservation Monitoring Centre during management of the CITES trade database. We also used these parameters to estimate the number of pangolins in illegal trade and which applied to volumes to live/dead pangolins, scales and meat where data reported the weight of animals/scales/meat only and not number of animals involved.

In practical terms this entailed receiving illegal trade data from Parties in response to Notification to the Parties 2017/035, and data from responses to Notification to the Parties 2014/059 and UNODC (from their World WISE database). A seizure database was built using MS Excel in which all seizures were cross-referenced against the three datasets using available information (e.g., date, location, derivatives seized). Seizures were then placed in the following categories: live/dead pangolins, scales, meat and medicine, as well as feet, garments, leather products, parts and derivatives, other, powder, shoes, skeletons, skin, skin pieces, skulls, specimens, tails and trophies.

To estimate the number of the pangolins involved in each seizure we used conservation parameters in the table below which we adapted from Challender et al. (2015) and Tikki Hywood Trust (2013) on the basis that only these derivatives could be unambiguously equated to an estimated number of pangolins.

Species	Derivative			
	Individual (kg)	Scales (g)	Meat (kg)	Shoes (no.)
<i>M. pentadactyla</i>		573.47		
<i>M. javanica</i>	4.96	360.51	4.59	2
<i>M. culionensis</i>				
<i>M. crassicaudata</i>		1000		
<i>M. tetradactyla</i>				
<i>M. tricuspis</i>		360.51		
<i>M. gigantea</i>		3600*		
<i>M. temminckii</i>				
<i>Manis</i> spp.	4.96	360.51	4.59	2

*Taken from Tikki Hywood Trust (2013).

Where seizure reports made reference to the specific species of pangolin being trafficked, we used species-specific parameters from the table above to calculate the number of pangolins involved. Where seizure records did not report beyond genus level, we used parameters for *Manis* spp. which are based on parameters for *M. javanica*. We did so on the basis that while the different species of pangolin vary in size and weight (e.g. between two and 35 kg in weight), an average sized Asian pangolin is in between the smaller, arboreal African pangolins and the larger ground-dwelling African species. However, this may potentially overestimate the number of African pangolins in illegal trade where seizures actually involve *M. gigantea* and/or *M. temminckii* but seizure records only report trade as involving *Manis* spp.

Annex 2 Legislation tables

Table 1. Parties with legislation regulating international trade in native and/or non-native species of Asian and African pangolin specimens based on responses to Notifications to the Parties No. 2017/035 and 2014/059. It was beyond the scope of this report to include a full and comprehensive list of relevant legislation from all 183 Parties to the Convention.

Party	Legislation and provisions
Native and non-native pangolin species	
Bhutan	Forest and Nature Conservation Act, 1995 (presently under revision).
Botswana	Wildlife Conservation and National Parks Act no. 28 of 1992 (Section 2, Fifth Schedule). In General, Sections 60 – 62 and 64 -65 may be used in combination to make the judgement to be as punitive as possible.
Chad*	There is no specific legislation for pangolins, but all pangolins are fully protected in Chad by Law No. 14/PR/2008 and its degrees of application 380. Pangolins are classified on list A as species with full protection.
China	Law of The People's Republic of China on The Protection of Wildlife (1988); Regulations of the People's Republic of China on Administration of Import and Export of Endangered Wild Animals and Plants (2006). The Chinese pangolin <i>Manis pentadactyla</i> is listed as a second class nationally protected species. Other pangolins that listed in CITES Appendix II are therefore protected and managed and their trade is regulated as species under second class protection.
Central African Republic	Wildlife and Protected Areas Management Code (as revised) - Applies to <i>M. gigantea</i> , <i>M. tricuspis</i> , <i>M. tetradactyla</i> and <i>M. temminckii</i> .
Ghana	<i>M. gigantea</i> and <i>M. tricuspis</i> are wholly protected species. This means they cannot be hunted, captured or destroyed. No imports of non-native species is permitted without CITES permits.
Kenya	Wildlife and Conservation Management Act (2013) - Regulates utilisation of native and non-native wildlife.
India	Wildlife Protection Act (1972) - Schedule I includes the <i>M. pentadactyla</i> and <i>M. crassicaudata</i> Indian Customs Act (1962) - For the other six species of pangolin.
Indonesia	Act. No. 5/1990 and Government Regulation No. 7 (1999). - Pertains to <i>M. javanica</i> For non-native species, Indonesia is adopting Decree No. 447 2003 to implement CITES under the Ministry of Forestry.
Malaysia (Peninsular Malaysia)	Wildlife Conservation Act (2010). <i>Manis</i> spp. are Totally Protected Wildlife being listed in the Second Schedule.

Appendix II under International Trade in Endangered Species Act 2008 (Act 686).

Malaysia (Sabah)	Wildlife Conservation Enactment (1997) <ul style="list-style-type: none">- Section 25 (2) pertains to poaching <i>M. javanica</i>- Section 41 (1) pertains to possession and applies to all <i>Manis</i> spp. Section 53 (1) pertains to import/exports from Sabah and applies to all <i>Manis</i> spp.
Malaysia (Sarawak)	Wildlife Protection Ordinance (1998) Chapter 26
Myanmar	<i>Manis pentadactyla</i> and <i>Manis javanica</i> are categorized as completely protected wildlife under the Protection of Wildlife and Protected Areas Law (1994) and the use of these species is regulated as follow: Article 16. The Director General may, with the approval of the Minister:- (a) permit the capture and possession of completely protected wildlife species by stipulating conditions to Government Department, Government Organization or non-Government Organization to conduct scientific research on the species.
Namibia	Controlled Wildlife Products and Trade Act (2008). This legislation is not species specific, but applies to all CITES listed species.
Nepal	National Parks and Wildlife Conservation Act (1973) <ul style="list-style-type: none">- Pertains to <i>M. pentadactyla</i> and <i>M. crassicaudata</i> which are Appendix I of the act. Nepal has recently passed a new CITES bill and is in the process of gazetting the new act.
Pakistan	<i>M. crassicaudata</i> is afforded protection under the following pieces of provincial wildlife law: <ul style="list-style-type: none">- The Islamabad Wildlife (Protection, Preservation, Conservation and Management) (Amendment) Act, 2008- The Sindh Wildlife Protection Ordinance, 1972- The Balochistan Wildlife (Protection, Preservation, Conservation and Management) Act, 2014.- The Khyber Pakhtunkhwa Wildlife and Biodiversity (Protection, Preservation, Conservation and Management) Act, 2014.- The Gilgit-Baltistan Wildlife Preservation Act, 1975- The Azad jammu and Kashmir Wildlife (Protection, Preservation, Conservation and Management) Ordinance, 2011.- The Punjab Wildlife (Protection, Preservation, Conservation and Management) (Amendment) Act, 2007 The Pakistan Trade Control of Wild Fauna and Flora Act 2012 <ul style="list-style-type: none">- Implements CITES in Pakistan <p>The CITES Management Authority in Pakistan has also imposed a ban on commercial export of all wild mammals. This is reflected in an Export Policy issued by the Ministry of Commerce.</p>
Philippines	Republic Act 9147 (Wildlife Resources Conservation and Protection Act), including Sections 3 (Scope of application), Section 4 (Jurisdiction of the Department of Environment and Natural Resources and the Department of

Agriculture), Section 11 (Exportation and/or Importation of Wildlife), and Section 19 (Designation of Management and Scientific Authorities for International Trade in Endangered Species of Wild Fauna and Flora).

Section 3 states: The provisions of this Act shall be enforceable for all wildlife species found in all areas of the country, including protected areas under Republic Act 7586 and Critical habitats. This Act shall also apply to exotic species which are subject to trade, are cultured, maintained and/or bred in captivity or propagated in the country.

Section 11 states: Wildlife species may be exported to or imported from another country as may be authorized by the Secretary or the designated representative, subject to strict compliance with the provisions of this Act and rules and regulations promulgated pursuant thereto: Provided, that the recipient of the wildlife is technically and financially capable to maintain it.

DENR Administrative Order No. 2004-15 (National List of Threatened Wild Fauna, which includes all species listed in the CITES Appendices). Violations committed against threatened species are imposed with higher penalties compared to non-threatened species.

Singapore	All species covered under Section 4(1), 4(2) and 5(1) of the Endangered Species (Import and Export) Act.
Thailand	Wildlife Reservation and Protection Act, B.E. 2535 (1992) - <i>M. pentadactyla</i> and <i>M. javanica</i> are listed as protected species in Thailand. All <i>Manis</i> spp. are afforded protection in Thailand through the implementation of CITES and regulation of import, export and re-export of all specimens of <i>Manis</i> spp.
Togo	For the native species: Ordinance N°4 of 16/01/1968 and Article 78 of the Environment Code (Law N ° 88-4 of 03/11/1988) - The three species (giant, white-bellied and black-bellied pangolins) belong to the list of partially protected species known as specific species whose hunting and capture, including those of their young, are only allowed to holders of catch licenses within the limits and with the means inscribed on the permit and to holders of special hunting licenses, but solely as a trophy or collector's item.
Uganda	All native species listed under 1st Schedule Part A of the Repealed Game Preservations Act (but schedule saved by Wildlife Act 2000): the listed species includes pangolins and are ‘ not to be hunted or captured throughout Uganda except under special permit’(i.e. Wildlife Use Right) The Wildlife Policy 2014 and Wildlife Act 2000 permit regulated wildlife trade. The Uganda Wildlife Act Part VI, sections 29 – 44 mandate the Uganda Wildlife Authority (UWA) to handle domestic wildlife trade [also international trade]. Under the Act, the Executive Director of Uganda Wildlife Authority can issue a Wildlife Use Right to any person or company that has applied for one under section 29 and 31 of the Act. The Executive Director of Uganda Wildlife Authority may issue a Wildlife Use Right to any person [or company] subject to terms and conditions so prescribed. The Wildlife Act under Sections 33-39 similarly prescribes

different steps and measures to be undertaken to ensure monitoring and to penalize non-compliant licensees.

Viet Nam	<p>For native species: Decree No 160/2012/NĐ-CP; Article 190 of Penal code amended 2009.</p> <p>For non-native species: Decree No 82/2006/NĐ-CP; Decree 157/2013/NĐ-CP on Administrative fines in Forest protection and Development.</p> <p>The illegal trade in non-native species listed in the CITES Appendices are treated as illegal trafficking of prohibited goods cross-border pursuant to the Penal Code if Appendix I, and following Decree 157 on Administrative violations if Appendix II.</p>
Zambia	<p>Wildlife Act No. 12 (1998). The pangolin is treated as a protected species and is not available on harvest quota due to inadequate information about the population status.</p>

Native pangolin species only

Bangladesh	Wildlife (Conservation and Security Act) 2012 (Schedule I)
Benin	Law 2002-16 (of 18 October 2004) and Decree 2011-394 (of 28 May 2011) lay down the modalities for the conservation, development and sustainable management of wildlife and its habitats in the Republic of Benin.
Cambodia	Forestry Law (2002): Chapter 10 and sub-decree No. 53 (2006) on international trade in endangered wild animal and plant species.
Côte d'Ivoire	Under the Wildlife Protection and Hunting Act (1965; as amended in 1994) <i>M. gigantea</i> is fully protected and <i>M. tricuspis</i> and <i>M. tetradactyla</i> are partially protected.
Cameroon	Forest Act (1994). Giant pangolin is Totally Protected. White-bellied and Black-bellied pangolins are Partially Protected- can be hunted with a hunting permit/collection permit.
Gabon	<p>Decree 0164/PR/ME (Annex 1) (of 19 January 2011) includes the Giant pangolins as an integrally protected species. This legislation regulates the classification and slaughter of animal species.</p> <p>Law 016/2001 (of 31 December 2001) on the Forest Code in the Gabonese Republic (Article 275) outlines penalties for offenses against fully protected species.</p> <p>Decree 0164/PR/MEF (Article 3)(of 19 January 2011) regulating the classification and slaughter of animal species(Hunting, capture, possession, marketing and transport of fully protected species are prohibited except Derogation granted by order of the Minister for Water and Forests to the holder of a scientific license for hunting or catching).</p>
Lao PDR	Wildlife and Aquatic Act 2007. <i>M. pentadactyla</i> and <i>M. javanica</i> are listed in the first prohibition category. This act prohibits the unlicensed extraction and/or possession of pangolins or their parts.

Liberia	Legislation regulates international trade in <i>M. gigantea</i> and <i>M. tetradactyla</i> but no further details were provided.
Nigeria	Endangered Species Act, CAP, E9, LFN (2004) <ul style="list-style-type: none"> - Pertains to <i>M. gigantea</i>, <i>M. tetradactyla</i>, <i>M. tricuspis</i> and <i>M. temminckii</i>. This act is enforced through agencies including the National Environmental Standard Regulatory Enforcement Agency.
Senegal	Hunting and Wildlife Protection Code (Law No. 86-04 of January 2004). <ul style="list-style-type: none"> - Pertains to <i>M. gigantea</i>, <i>M. tetradactyla</i>, <i>M. tricuspis</i> and <i>M. temminckii</i>. - All African pangolin species are fully protected.
South Africa	The National Environmental Management: Biodiversity Act (10 of 2004) and its Threatened or Protected Species (TOPS) Regulations regulates internal trade as well as CITES Regulations for international trade. Western Cape and Mpumalanga Provinces do not implement the TOPS Regulations and they regulate provincial species under their provincial Ordinance/legislation.
Zimbabwe	Parks and Wildlife Act; Chapter 20:14 (1996) as amended in 2001. Statutory Instrument 56 of 2012 (Payment for Hunting of Animals and Fish). Statutory Instrument 93 of 2009 (Payment for Trapping of Wildlife). General Laws Amendment No 5 of 2011.
	Other legislation governing conservation and trade of Pangolin are: Environmental Management Act; Chapter 20:27. Forest Act; Chapter 19:05. Statutory Instrument 362 of 1990: Parks and Wildlife (General) Regulations, 1990. Statutory Instrument 76 of 1998: Import and Export of Wildlife Products. Statutory Instrument 40 of 1994: Parks and Wildlife Act (General) Amendments. Statutory Instrument 26 of 1998: Parks & Wildlife Act (General) Amendments. Trapping of Animals Control Act 20.16

Non-native pangolin species only

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom (EU member States)	All <i>Manis</i> spp. are covered by the EC Council Regulation 338/97 on the Protection of Species of Wild Fauna and Flora in trade.
--	--

Georgia	Law on Licences and Permits; Governmental Decree #18 (February, 2007) on rules and procedures of CITES permits issuance.
Japan	Foreign Exchange and Foreign Trade Act - Pertains to all <i>Manis</i> spp.
Monaco	See EU member States above
United Arab Emirates (UAE)	Federal Law No. 11 (2002) regarding CITES. Ministerial Decision No. 346 (2012) regarding the import of wild animals, which prohibits the importation of wildlife species not bred in captivity for personal and commercial purposes unless it was for authorized agencies such as zoos and breeding centers that are included in Appendix (a) of the decision. Pangolins are included in Appendix (a).
USA	For all pangolin species: - Code of Federal Regulations (50), part 23. For Temminck's ground pangolin: - US Endangered Species Act. - Code of Federal Regulations (50), part 17 and 23.

*Chad confirmed by email that all pangolins are protected.

Table 2. Parties that regulate domestic use of pangolin specimens and available information on permitted and forbidden uses of specimens based on responses to Notifications to the Parties 2017/035 and 2014/059. It was beyond the scope of this report to include a full and comprehensive list of relevant legislation from all 183 Parties to the Convention.

Party	Information on how domestic use is regulated and available information on permitted/forbidden uses
ASIAN RANGE STATES	
Bangladesh	As a Schedule I species (Wildlife (Conservation and Security Act) 2012 (Schedule I)) all kinds of trade and domestic use is prohibited.
Bhutan	Wildlife in any form is prohibited for domestic use. This is inclusive of not allowing to keep wild animals as pet.
Cambodia	Forestry Law (2002) - Domestic use of pangolins <i>M. javanica</i> is only permitted for customary use. Domestic trade in this species is forbidden.
China	Since 2007, acquisition and utilization of Chinese pangolin from the wild in any form were forbidden. Since 2008 provisions have been issued to strictly control and regulate the stockpiles of all pangolin scales. The stockpiles of pangolin scales were catalogued and registered and the use is labelled.
India	Both <i>M. pentadactyla</i> and <i>M. crassicaudata</i> are covered under schedule I of the Wild Life (Protection) Act1972. As per section 9 of the Wild Life (Protection) Act1972 hunting of these species is prohibited. The definition of hunting as per section 2(16) includes (i) killing or poisoning of any wild animals or captive animal and every attempt to do so; (ii) capturing, coursing, snaring, trapping, driving or baiting any wild or captive animal and every attempt to do so; (iii) injuring or destroying or taking any part of the body of any such animal. As per Section 40(2) of WLPA 1972 “ No person shall, after the commencement of this Act, acquire, receive, keep in his control, custody or possession, sell, offer for sale, or otherwise transfer or transport any animal specified in Sch. 1 or Part 11 of Sch. 11, any uncured trophy or meat derived from such animal, or the salted or dried skin of such animal or the musk of a deer or the horn of a rhinoceros, except with the previous permission in writing of the Chief Wildlife Warden or the authorized officer.” As per Section 49B of WLPA 1972 “ Prohibition of dealing in trophies, animal articles etc. derived from Scheduled animals.- (1) Subject to the other provisions of this section, on and after the specified date, no person shall (a) Commence or carry on the business as (i) a manufacturer of, or dealer, in scheduled animal articles; or (ii) a taxidermist with respect to any schedule animals or any parts of such animals; or

(iii) a dealer in trophy or uncured trophy derived from any scheduled animal; or (iv) a dealer in any captive animal being scheduled animal; or (v) a dealer in meat derived from any scheduled animal⁵; or (b) cook or serve meat derived from any scheduled animal in any eating-house.”

The other non-native species are not included in the said Act.

Indonesia

The use of protected species is regulated under Government Regulation No. 8 (1999) and Ministry of Forestry Decree No. 447 (2003).

Captive-breeding of protected species is regulated under the Ministry of Forestry regulation No. 19/Menhut-II/2005, revised through Ministry of Forestry Regulation No. 69 (2013).

Malaysia (Sabah)

Wildlife Conservation Enactment (1997)

- *M. javanica* is listed in Part I of Schedule II.
- Under Section 26(1) a special licence may be obtained to hunt *M. javanica* in limited numbers for the purpose of research and zoological collections. This would be issued by the Director of Sabah Wildlife Department with notice given in the government gazette.

However, no licenses to hunt or trade pangolins from the wild, or captive-breeding programmes are currently permitted.

Myanmar

Manis pentadactyla and *Manis javanica* are categorized as completely protected wildlife under the Protection of Wildlife and Protected Areas Law (1994) and the use of these species is regulated as follows: Article 16. The Director General may, with the approval of the Minister:- (a) permit the capture and possession of completely protected wildlife species by stipulating conditions to Government Department, Government Organization or non-Government Organization to conduct scientific research on the species.

Nepal

Any form of use of pangolin specimens is not allowed in Nepal.

Pakistan

Manis crassicaudata is protected in Pakistan (see Table 3). This means it cannot be hunted, killed or captured.

Philippines

Different uses or utilization of pangolin specimens are regulated through the issuance of necessary permits such as follows:

- For research purposes, a Gratuitous Permit must be secured
- For local transport, provided that the collection/possession is legal, a Local Transport Permit must be secured
- For conservation breeding purposes, a Wildlife Collector's Permit and Wildlife Farm Permit must be secured
- For commercial breeding provided that the technology has been established and proven already, a Wildlife Collector's Permit and Wildlife Farm Permit must be secured

All uses enumerated above are forbidden/prohibited if the necessary permits are not secured.

Singapore	Domestic use of pre-Convention pangolin scales for local sale are allowed in Singapore. AVA may also consider allowing the use of pangolins and its parts/products for zoological or research purposes. No new imports and exports of wild-caught Asian pangolins and its parts/products are permitted.
Thailand	Domestic use of <i>M. pentadactyla</i> and <i>M. javanica</i> is permitted only for non-commercial purposes, i.e. scientific research, protection, breeding zoological purposes, with permission from the Director-General of the Ministry of Natural Resources and Environment and Department of National Parks, Wildlife and Plant Conservation.
Viet Nam	The domestic use of pangolin parts and derivatives is prohibited by Law (Decree 160/2012). Furthermore in May 2015 the Ministry of Health removed Pangolin scales from the list of treatments covered by State medical insurance. There is no legal source of pangolins for commercial purpose in Viet Nam.

AFRICAN RANGE STATES

Benin	Pangolins are fully protected species under Law 2002-16 (of 18 October 2004) and Decree 2011-394 (of 28 May 2011). Pangolin species may be re-exported on presentation of the original originating certificate issued by the country from which the animal was exported for the first time.
Botswana	Under the Wildlife Conservation and National Parks Act no. 28 of 1992 (Section 17) no use is allowed for protected species including the pangolin.
Cameroon	Game farming and game ranching are the captive exploitation frameworks for animals in Cameroon. They are governed by the forestry law of 1994. However, this type of exploitation does not yet exist in Cameroon.
Central African Republic	All species of pangolins are classified in class A of fully protected species. Art. 99 of this document stipulates: the possession or transfer of the remains or trophies of fully protected animals brought to Class A of this Code is prohibited.
Chad	Decree No. 380/PR/PM/MAE/2014 (of 5 June 2014) details rules for fauna and classifies all species of pangolin on list A of fully protected species.
Côte d'Ivoire	Act No. 94-442 (1994) on the Protection of Wildlife and Hunting <ul style="list-style-type: none"> - Lists <i>M. gigantea</i> in Annex I (Strictly Protected Species). This prohibits the capture and hunting of <i>M. gigantea</i>, including of juveniles, except to holders of scientific licenses/permits. - Lists <i>M. tetradactyla</i> and <i>M. tricuspis</i> in Annex II (Partially Protected) meaning hunting and capture are permitted to holders of sport hunting licenses or within limits set out by permit. Order No. 003/SEPN/CAB (1974)

- Prohibits hunting across the national territory of Côte d'Ivoire

This act therefore prohibits the hunting and capture of all species of pangolin.

Gabon	<p>The giant pangolin is a fully protected species in Gabon (Annex 1 of Decree 0164/PR/MEF (of 19 January 2011)). Hunting, capture, detention, marketing and transport of fully protected species are prohibited throughout the country (Article 3 of the Decree). Consequently, according to this Decree the Black-bellied and White-bellied pangolins can be caught and hunted.</p> <p>Article 8 stipulates that only the hunting of unprotected or partially protected adult male animals may be subject to the issuance of a hunting license. Article 9 states that the hunting of more than two animals of the same species or of four different species on the same day and by the same hunter is prohibited.</p>
Ghana	<p>Protected under Legislative instrument (LI) 685 as wholly protected species. Animals that are wholly protected means that no person shall at any time hunt capture or destroy any of the species.</p>
Kenya	<p>Wildlife Conservation and Management Act (2013)</p> <ul style="list-style-type: none"> - Domestic use of pangolin products and/or derivatives is prohibited by law.
Namibia	<p>No domestic trade in pangolins is permitted in Namibia. Any person wanting to possess a Controlled Wildlife Product must apply to the Ministry of Environment and Tourism (MET) for a possession permit. All manufacturers and dealers of Controlled Wildlife Products must ensure all items in their possession are certified by MET before being displayed for sale.</p>
Nigeria	<p>Non-commercial uses are permitted outside protected areas. Hunters are restricted from any illegal hunting of pangolins in the reserved areas.</p>
Senegal	<p>All species of pangolin are fully protected in Senegal, with the exception of for scientific reasons, through the Code of Hunting and Wildlife Protection, Law No. 8604 of 24.01.1986, Decree No. 86.844 of 14.07.1986.</p>
South Africa	<p>All restricted activities in terms of the Threatened or Protected Species Regulations are applicable to Temminck's ground pangolin (<i>Manis temminckii</i>) and a permit is needed to perform any of the restricted activities while the National CITES Regulations regulates international trade. These Regulations were published under the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004). Definition of "restricted activity" "restricted activity":</p> <p>(a) in relation to a specimen of a listed threatened or protected species, means-</p>

(i): hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen;

(ii) gathering, collecting or plucking any specimen of a listed threatened or protected species;

(iii) picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species;

(iv) importing into the Republic, including introducing from the sea, any specimen of a listed threatened or protected species;

(v) exporting from the Republic, including re-exporting from the Republic, any specimen of a listed threatened or protected species;

(vi) having in possession or exercising physical control over any specimen of a listed threatened or protected species;

(vii) growing, breeding or in any other way propagating any specimen of a listed threatened or protected species, or causing it to multiply;

(viii) conveying, moving or otherwise translocating any specimen of a listed threatened or protected species;

(ix) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of a listed threatened or protected species; or

(x) any other prescribed activity which involves a specimen of a listed Threatened or Protected Species”.

Togo

According to Ordinance No.4 of 16/01/1968 and Law No. 2008-009 of 19 June 2008, pangolins are partially protected species and by ricochet cannot be captured and hunting only on obtaining a special license of capture and hunting but only as a unit as a trophy or collector's item.

Uganda

The existing law provides regulatory mechanisms for utilizing all species, including pangolins.

Pangolins are ‘not to be hunted or captured throughout Uganda except under special permit’, [under 1st Schedule Part A of the repealed Game Preservations Act (but the schedule was saved by Wildlife Act 2000), the same Wildlife Act provides for utilization of all wildlife species under ‘ a wildlife use right’, the equivalent of a ‘special permit’.

Under section 30, any person or community may apply for any type of wildlife use rights which are spelt under Section 29(1) of the Act, including: (a) hunting; (b) farming; (c) ranching; (d) trading in wildlife and wildlife products; (e) using wildlife for educational or scientific purposes including medical experiments and development; and, (f) general extraction.

Under Section 32(1)(b), it is provided that on receiving an application for one or more wildlife use rights from a person, community or lead agency under Section 31(1), the Authority should send a copy of the application to the district council having

jurisdiction in the area of the application, requesting the district council to comment on the application within twenty-one days of receiving the application. Under subsection (7) thereof, the wildlife use right may be granted subject to conditions concerning persons within a community or organisation who may exercise the wildlife use right.

The Act treats wildlife use rights (provided under Section 29) as property rights and are deeply entrenched as such. This is for instance, clear from their mode of transfer, under Section 41(1) of the Act. It provides for the transferability of wildlife use rights, in the following terms: (a) a class A and class E wildlife use right shall be transferable only with the permission of the authority; (b) a class B, class C, class D and class F wildlife use right shall be transferable as a private property right subject to [the] Act; (c) other classes of wildlife use rights created by regulations made by the Minister under [the] Act are transferable to the extent and in accordance with procedures prescribed in those regulations.

Under Section 23(a) of the Act, the Executive Director of the Authority is empowered to issue a permit to any person intending to harvest a resource within a wildlife protected area. Under subsection (3), private ownership under license is allowed, where any protected species is lawfully taken under a permit or a license issued or wildlife use right granted or issued under the Act.

The wildlife use right grant can be varied (as provided under Section 38) or revoked (as provided under Section 39). The use right can also be suspended if terms and conditions are violated. In recognition of importance of wildlife to the Ugandan cultural values, the act under section 3(7) provides that the Minister may, on the advice of the board, by regulations prescribe measures for the registration and management of the specimens used for cultural purposes by any community.

In Practice, whereas Uganda does not authorize trade in pangolin and their products without a license, it is common for people in villages across the country to collect pangolin scales from dead animals and sell to local medicine men who believe the scales have medicinal values. It is illegal and outside the above legal framework. The use of pangolin scales, though in small quantities per person, is so wide under traditional medicine in almost all cultures in Uganda. As earlier mentioned in this questionnaire, it's estimated that over 10,000kg of pangolin scales is exposed for sale illegally in local markets in Uganda.

There are two companies that have been licensed under the above regulatory framework.

1. Olsen East Africa International Investment Company Limited (OEAIICL) was granted farming use right (captive breeding) in April 2014). The company has teamed up with Chinese pangolin breeding specialist, and is in advanced stage of preparing the holding ground. The use right grant is subjected to various conditions including the return of pangolins back to the wild after successful captive breeding. The company also has a wildlife use right for trade, meaning it can transact the sale and purchase of pangolin scales and products in the country. The Breeding Program is however yet commence.

2. Smico Skin Crafts Industries Limited that was granted use right for trade, and was granted a permit to collect the pangolin scales

held by communities across the country in 2013 and 2014, generating 70Kg and 7179Kg respectively. Of this, 3,211Kg has been exported and the balance is still held by the company. Note that no permit has been granted for live animal harvest or hunting. Though not forbidden by law, the government is not intending to give such permits.

United Republic of Tanzania	Domestic use of pangolins is regulated. Permitted uses include for wildlife ranching, farming, breeding, zoo, orphanage centres and sanctuaries.
Zambia	The permit and licensing regulations allows ranching facilities to have pangolins, however, consumptive use is forbidden. Most confiscated pangolins are linked to traditional doctors and witch finders.
Zimbabwe	The cultural observance in the country was that pangolins should only be presented to a traditional leader (Chief) or person of high authority such as President who then had the discretion of what to do with the animal. This is no longer allowed. Under the current laws in Zimbabwe, pangolins are a protected species and possession is regulated through a Permit system administered by the Zimbabwe Parks and Wildlife Management Authority.

NON-RANGE STATES

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom	All <i>Manis</i> spp. are covered by the EU Wildlife Trade Regulations (EU Council Regulation 338/97) which regulated the buying and selling of wildlife in the European Union.
Switzerland	Under the Federal Law on CITES Switzerland, the legal origin of CITES specimens must be proven otherwise specimens can be confiscated.
Georgia	Domestic use is allowed if imported legally. However, Georgia has never recorded trade in pangolins, legal or illegal.
Japan	Transfer, delivery or receiving of individuals or products thereof, which maintain the entire form of individual, are regulated under the Law for the Conservation of Endangered Species of Wild Fauna and Flora (LCES).
United Arab Emirates (UAE)	Under Federal Law No. 11) (2002) concerning CITES. Also, Ministerial Decision No. 346 (2012) regarding the import of wild animals, which prohibits the importation of wild species “not-bred in captivity” for personal and commercial purposes unless it was for authorized agencies such zoos and breeding centers that are

included in Appendix (a) of the decision. Pangolins are included in Appendix (a).

United States

Manis temminckii is classified as endangered under the United States Endangered Species Act. This listing generally prohibits import, export, and interstate and foreign commerce of *M. temminckii*, including parts and products without an ESA permit. For all pangolin species, our “use-after-import” regulations at 50 CFR 23.55 specify that Appendix-I specimens may be used, including a transfer, donation, or exchange, only for non-commercial purposes, with certain limited exceptions.

Table 3. Minimum and maximum penalties imposed in national legislation upon conviction for poaching, illegal trade, illegal possession or other illegal activities concerning pangolins based on responses to Notifications to the Parties 2017/035 and 2014/059. It was beyond the scope of this report to include a full and comprehensive list of relevant legislation from all 183 Parties to the Convention.

Party	Available information on minimum and maximum penalties
ASIAN RANGE STATES	
Bangladesh	Under the Wildlife (Conservation and Security) Act (2012), Article 34 (b) states that there is Max. 1 year imprisonment or Max. 50,000 BDT penalty, or both, and in case of second time offense: Max. 3 years imprisonment or Max. 200,000 BDT penalty, or both, for illegal possession of any wildlife, its body parts and for trade.
Bhutan	<p>The Indian Pangolin is included under Schedule I of Forest and Nature Conservation Act 1995 (FNCA 1995) and a fine Nu. 5,000 will be levied for unlawful killing or illegal possession of this species outside protected areas (PAs). If the offence is committed in the core zone of a PA, then, in addition to fine, the penalty will range from Nu. 60,000-200,000 (US\$1=Nu.63 approx.). In the case of Chinese Pangolin, this species does not appear in any of the listed schedules for now. The species listing/delisting for Schedule I&II is presently under consideration and this species will be included in the appropriate Schedule. Fines of this species for now will be handled under unlisted offence of FNCA 1995 whereby Nu.10,000 will be levied to any person for illegal possession or unlawful killing or trading, etc. in addition to other penalty based on the severity of offence</p> <p>As pangolins are completely protected wildlife under the Protection of Wildlife and Protected Areas Law (1994), the penalties concerned for wildlife crime regarding pangolins are as below: 37. Whoever commits any of the following acts shall, on conviction be punished with imprisonment for a term which may extend to 7 years or with fine which may extend to Kyats 50,000 or with both: (a) killing, hunting or wounding a completely protected wildlife species without permission; possessing, selling, transporting or transferring such wildlife or any part there of ; (b) exporting without the recommendation of the Director General a completely protected wildlife or protected wild plant species or any part thereof.</p>
Brunei Darussalam	Penalty for Section 47 (1) (a)/ 48 (1) (a) trade in specimen of any species listed in Appendix I without the appropriate permit or certificate / Possession of Specimen of any species listed in Appendix I. Imprisonment for a term not exceeding 5 years, a fine not exceeding \$100,000 or both (Individual). A fine not exceeding \$200,000 (Body Corporate).
Cambodia	Poaching, illegal trade, illegal possession – A transactional fine from the Forestry Administration for two (2) to three (3) times the market value of the pangolin and specimens shall be confiscated as state property. Plus, any individual who has committed class II forestry offenses shall be punished with one (1) to five (5) years in prison and /or court fines of ten (10) million to one hundred (100) million Riel, and confiscation of all evidence as State property (Class II Forestry Offenses: 10 - hunt, kill, trade, or export rare species). Any individual who has committed the following forestry offenses shall be subjected to a transactional fine from the Forestry Administration for

two (2) to three (3) times the market value of the pangolin and specimens (17 - possess, process, stock, transport or import rare wildlife species or specimens).

China

According to the Criminal Law, Law on the Protection of Wildlife and a Judicial Interpretation of the Supreme Judicial Court, criminals that poach, illegally transport or trade in any pangolins will be prosecuted for criminal responsibility. If the number of pangolins that are illegally hunted, transported or traded is less than 8 individuals, the offender shall be sentenced to fixed-term imprisonment of no more than five years. And if the circumstances are especially serious like the number of pangolins is more than 16 individuals, the offender shall be sentenced to life imprisonment, and concurrently be sentenced to confiscation of property. The exotic pangolins are treated as Chinese pangolin.

India

As per section 51 of the Wild Life (Protection) Act 1972 51. Penalties. (1) Any person who [contravenes any provisions of this Act [10 except Chapter VA and section 38J]] or any rule or order made there under or who commits a breach of any of the conditions of any licence or permit granted under this Act, shall be guilty of an offence against this Act, and shall, on conviction, be punishable with imprisonment for a term which may extend to [three years] or with fine which may extend to [twenty five thousand rupees] or with both. Provided that where the offence committed is in relation to any animal specified in Scheduled I or Part 11 of Sch. 11, or meat of any such animal, animal article, trophy, or uncurled trophy derived from such animal or where offence relates to hunting in, or altering the boundaries of a sanctuary or a National Park, such offence shall be punishable with imprisonment for a term which shall not be less than three years but may extend to seven years and also with fine which shall not be less than twenty five thousand rupees. Provided further that in the case of a second or subsequent offence of the nature mentioned in this sub-section, the term of imprisonment shall not be less than three years but may extend to seven years and also with fine which shall not be less than twenty five thousand rupees. (1A) Any person who contravenes any provisions of Chapter VA, shall be punishable with imprisonment for a term which shall not be less than [three years] but which may extend to seven years and also with fine which shall not be less than ten thousand rupees. [1C) Any person, who commits an offence in relation to the core area of a tiger reserve or where the offence relate to hunting in the tiger reserve or altering the boundaries of the tiger reserve, such offence shall be punishable on first conviction with imprisonment for a term which shall not be less than three years but may extend to seven years, and also with fine which shall not be less than fifty thousand rupees but may extend to two lakh rupees; and in the event of a second or subsequent conviction with imprisonment for a term of not less than seven years and also with fine which shall not be less than five lakh rupees but may extend to fifty lakh rupees.

Indonesia

Penalties for violations – A fine of up to IDR 50,000,000 and a maximum one year imprisonment.
Penalties for intentional crime – A fine of up to IDR 1,000,000 and a maximum of five years imprisonment.

Malaysia (Peninsular Malaysia)

According to the Wildlife Conservation 2010 (Act 716), any person who hunts or keeps any totally protected wildlife without a special permit commits

an offence and shall, on conviction, be liable to a fine not exceeding MYR100,000 or to imprisonment for a term not exceeding 3 years or to both.

Furthermore, according to Section 68(2)(a), specifically for *M. javanica* where the offence involves twenty animals or more, the culprit shall, on conviction, be punished with a fine of not less than MYR50,000 and not more than MYR100,000 or with imprisonment for a term not exceeding 3 years or both.

Malaysia (Sabah)

Manis javanica is currently listed Part I, Schedule II of the Wildlife Conservation Enactment (1997). However, as all eight species of pangolin are now listed in CITES Appendix I, *M. javanica* will be treated as a species listed in Part I, Schedule I. Poaching and possession of *M. javanica* therefore carries a penalty of not less than RM50,000 and not more than RM250,000 and jail for a term not less than 1 year and not more than 5 years.

In addition, bringing into the state of Sabah any protected species or other exotic animal products illegally (i.e: non-native pangolin spp. or pangolin scale or meat) carries a penalty of not less than RM50,000 and not more than RM250,000 and jail for a term not less than 1 year and not more than 5 years.

Malaysia (Sarawak)

Wildlife Protection Ordinance, 1998, Section 29 (2). Penalty of imprisonment for 1 year or a fine of RM10,000.

Myanmar

Pangolins are completely protected wildlife under the Protection of Wildlife and Protected Areas Law (1994). Penalties concerning pangolins are below:

37. Whoever commits any of the following acts shall, on conviction be punished with imprisonment for a term which may extend to 7 years or with fine which may extend to Kyats 50,000 or with both:-

(a) killing, hunting or wounding a completely protected wildlife species without permission; possessing, selling, transporting or transferring such wildlife or any part thereof ;

(b) exporting without the recommendation of the Director General a completely protected wildlife or protected wild plant species or any part thereof.

Nepal

Any person who illegally kills or injures, sells, purchases or transfers or obtains, or keeps, purchases or sells trophies of protected wildlife (which includes *M. pentadactyla* and *M. crassicaudata*), shall be punished with a fine ranging from NPR 500,000-1,000,000 and imprisonment ranging from five years to 15 years or both.

In case any person who knowingly helps any person in committing any offense punishable under this Act, such accomplice shall be punished with half the punishment to be given to the principal offender.

Pakistan

Manis crassicaudata is protected under provincial wildlife laws. As an example penalties under the Khyber Pakhtunkhwa Wildlife and Biodiversity (Protection, Preservation, Conservation and Management) Act (2014) are: Minimum – A fine of PKR 10,000 or two weeks imprisonment, or both, plus the value of the wild animal or one month in lieu thereof.

Maximum – A fine of PKR 45,000 or two years imprisonment, or both, plus the value of property of two month's imprisonment in lieu thereof.

Under The Pakistan Trade Control of Wild Fauna and Flora Act 2012 (CITES law of Pakistan) any violation would result in: imprisonment for a term not less than one year or more than two years or a fine not less than 0.5 million rupees or more than 1 million rupees and confiscation or return of specimen unlawfully traded.

Philippines

Considering that all pangolins are CITES I-listed species effective 02 January 2017, they are categorized as Critically Endangered pursuant to DENR DAO 2004-15. As such, the minimum and maximum penalties would be as follows:

- Killing and destroying: imprisonment of 6 years and 1 day to 12 years and/or fine of one hundred thousand pesos (PhP 100,000.00) to one million pesos (PhP 1,000,000.00)
- Inflicting injury which cripples and/or impairs the reproductive system: imprisonment of 4 years and 1 day to 6 years and/or a fine of fifty thousand pesos (PhP50,000.00) to five hundred thousand pesos (PhP 500,000.00)
- Trading: imprisonment of 2 years and 1 day to 4 years and/or a fine of five thousand pesos (PhP5,000.00) to three hundred thousand pesos (PhP 300,000.00)
- Collecting, hunting or possessing wildlife (including *M. culionensis*), their by-products and derivatives: imprisonment of 2 years and 1 day to 4 years and a fine of thirty thousand pesos (PhP 30,000.00) to three hundred thousand pesos (PhP 300,000.00)
- Gathering or destroying active nests: imprisonment of 2 years and 1 day to 4 years and a fine of thirty thousand pesos (PhP 30,000.00) to three hundred thousand pesos (PhP 300,000.00)
- Maltreating and/or inflicting other injuries not covered by the above: imprisonment of 6 months and 1 day to 1 year and a fine of fifty thousand pesos (PhP 50,000.00) to one hundred thousand pesos (PhP 100,000.00)
- Transporting without the necessary permit/s: imprisonment of 6 months and 1 day to 1 year and a fine of fifty thousand pesos (PhP 50,000.00) to one hundred thousand pesos (PhP 100,000.00).

Singapore

Under the Endangered Species (Import and Export) Act 2006, any person found importing, exporting or re-exporting pangolins, its parts and products are liable on conviction to a fine of up to \$50,000 per scheduled species (not exceeding a total aggregate of \$500,000) and/or up to 2 years imprisonment. Under the Wild Animals and Birds Act, any person found poaching any wild animal or bird (including native pangolins) may be liable to a fine not exceeding \$1000 and to the forfeiture of the wild animal or bird.

Thailand

A maximum fine up to THB 40,000 and up to four years imprisonment based on the Wildlife Reservation and Protection Act, BE2535 (1992).

Viet Nam

Since May, 2015 individuals violating the law on illegal poaching, trading, and/or possessing native pangolins will receive the penalty of 3 months to 3 years imprisonment, and for non-native species a fine of up to 500 million VND (25.000 USD) depending on the scale of the trade.

The two native species of pangolin (Chinese and Sunda pangolin) are listed in Decree 160 – which means violations are criminal and covered in the Penal code. This stipulates maximum custodial sentences from 6 months to seven years and fines from \$2300-\$23,000.

AFRICAN RANGE STATES

Benin	Prison sentences of between 1 and 3 years and fines of 100,000 to 500,000 FCFA are for poaching.
Botswana	Under the Wildlife Conservation and National Parks Act no. 28 of 1992 (Section 17) perpetrators liable to a fine of P10, 000.00 and to imprisonment for 7 years.
Cameroon	Penalties are set by the 1994 forestry law. They vary according to whether the animal is class A, B or C. For Class A species including the giant pangolin, sentences range from a fine 500.000 to 3.000.000 FCFA and/or a jail sentence of between 1 to 3 years.
Central African Republic	<p>Art. 222 shall be punished with imprisonment of one (1) year to five (5) years and a fine of 500,000 to 15,000,000 FCFA or one of these two penalties only, whoever:</p> <ul style="list-style-type: none">- transforming illegally protected or illegally obtained animal material;- transform the material without verifying its legal origin;- manufacture prohibited products from animal material; and- operate facilities for processing animal material or without a permit. <p>Art. 227: A person who has been sentenced to imprisonment from one (1) year to five (5) years and a fine of between 1,000,000 and 5,000,000 CFA francs or one of these two penalties only,</p> <ul style="list-style-type: none">- sold any specimens or products of wild fauna (meat, bodies or trophies) illegally killed, harvested or illegally obtained;- transported, sold and offered for sale of any specimen listed in the CITES Appendices that has been imported, introduced from the sea or captured in the wild without the required permits;- marketed or transported illegally imported specimens;- engaged in trade contrary to trade restrictions or controls of a governmental nature. <p>In all cases, the remains and trophies will be confiscated for the benefit of the State.</p>
Chad	Intentionally shooting, capturing or injuring an animal, the hunting of which is prohibited, shall be punished with imprisonment of one year to three years and/or a fine of 100,000 FCFA without prejudice to their confiscation and possible damages.
Côte d'Ivoire	<p>Fine of between 3,000 and 300,000 CFA and imprisonment of between two and 12 months or one of these penalties only. Also, the confiscation of captured animals or their remains, or a conviction for payment of an amount equal to their value if they cannot be conveniently seized.</p> <p>These penalties are accompanied by the confiscation of weapons and other materials used for hunting.</p> <p>These penalties are doubled if one of the following conditions are met:</p> <ul style="list-style-type: none">- the offenses are committed in a national park of reserve;- the offenses are committed at night with illuminating equipment;- recidivism. <p>These penalties are tripled if two of the above conditions are fulfilled.</p>

Imprisonment shall be compulsory without suspension and without extenuating circumstances where the perpetrator of an offense committed the offense in a reserve of park and has already been convicted of similar offences.

Gabon	The perpetrators of these offenses are punishable by imprisonment of three to six months and a fine of 100,000 to 10,000,000 CFA francs or one of these two penalties only.
Ghana	Fine equivalent to 200 US\$ minimum and 500 US\$ maximum or to imprisonment not exceeding 6 months or both.
Kenya	Fine of not less than 1 million Kenyan Shillings or imprisonment for a term of not less than five years, or both.
Liberia	Confiscation and fine of \$500.00 and/or or imprisonment of 6 months to 1 year.
Namibia	A person convicted for poaching, illegal trade or illegal possession of Controlled Wildlife Products can be liable to a fine of not exceeding N\$ 200,000.00 or to imprisonment for a period not exceeding 20 years, or to both.
Nigeria	Fine of 500,000 Nigerian naira or five years imprisonment (the minimum of N500,000 or five years imprisonment or both has been proposed in the amendment to the extant law).
Senegal	Sentences range from 1-5 years imprisonment
South Africa	(1) A person convicted of an offence in terms of section 101 of NEMBA is liable to a fine not exceeding R10 million, or an imprisonment for a period not exceeding ten years, or to both such a fine and such imprisonment. If a person is convicted of an offence involving a specimen of a listed threatened or protected species, a fine may be determined, either in terms of subsection (1) or equal to three times the commercial value of the specimen in respect of which the offence was committed, whichever is the greater.; and Notwithstanding anything to the contrary in any other law, a magistrate's court shall have jurisdiction to impose any penalty prescribed by this Act.
Togo	Any person who has poached, trafficked illegally or has committed other illegal activity in respect of specimens of pangolin species, is liable to penal sanctions with fines ranging from 50,000 CFA to 100,000 CFAF and/or imprisonment ranging from one month to one year.
Uganda	Poaching, illegal possession of any other illegal activity The Wildlife Act (section 75) provides that, any person who is convicted of an offence involving: (a) taking, hunting, molesting or reducing into possession any protected species (pangolin inclusive); (b) possession of, selling, buying, transferring or accepting in transfer specimen of protected species; is liable to a fine of not less than one million shillings [USD 35] or to imprisonment for a term of not more than five years or to both; and in any case, the fine shall not be less than the value of the specimen involved in the commission of the offence.

Illegal trade (in export or import): Section 76 of the Act provides, any person who is convicted of an offence [of illegal export or illegal import] is liable to a fine of not less than ten million shillings [USD 35,000] or to imprisonment for a term of not less than seven years, and in any case the fine shall not be less than the value of the specimen involved in the commission of the offence. The above penalties apply to both native and non-native pangolin species.

United Republic of Tanzania	Penalty for unlawful possession of trophies varies depending on the schedule in which the animal is included and the value of the trophy. For a pangolin trophy the penalty imprisonment for a term of not less than twenty years but not exceeding thirty years and the court may, in addition thereto, impose a fine not exceeding five million shillings or ten times the value of the trophy, whichever is larger amount.
Zambia	Sub regulation (2): Any person who contravenes sub-regulation (1) commits an offence and is liable, upon conviction to a fine not exceeding fifty thousand penalty units or to imprisonment for a term not exceeding five years or to both.
Zimbabwe	Minimum sentence is 9 years imprisonment. Monetary compensation according to Statutory Instrument 56 & 57 of 2012 of USD 5000.00 may also be enforced.

NON-RANGE STATES

Austria	Minimum penalties are always dependent upon the judge involved and is often well below what national legislation would foresee. Maximum 5 years imprisonment.
Bulgaria	<p>Article 127 of the Biodiversity Act describes the penalties relating to violation listed under Art. 16 (1) of Regulation 338/97 which also apply for the pangolins, as follows:</p> <p>(1) Any violation covered by Litterae "b", "c", "d" and "e" shall be punishable by a fine of BGN 700 or exceeding this amount but not exceeding BGN 4,000, in the case of natural persons, or by a pecuniary sanction of BGN 1,500 or exceeding this amount but not exceeding BGN 10,000, in the case of legal persons and sole traders.</p> <p>(2) Any violation covered by Litterae "k", "l", and "m" shall be punishable by a fine of BGN 1,000 or exceeding this amount but not exceeding BGN 6,000, in the case of natural persons, or by a pecuniary sanction of BGN 2,500 or exceeding this amount but not exceeding BGN 12,000, in the case of legal persons and sole traders.</p> <p>(3) Any activity falling under Litterae "a", "f", "g", "h", "i", and "j" shall be punishable by a fine of BGN 2,000 or exceeding this amount but not exceeding BGN 10,000, in the case of natural persons, or by a pecuniary sanction of BGN 5,000 or exceeding this amount but not exceeding BGN 30,000, in the case of legal persons and sole traders.</p> <p>Since 2011 Bulgarian Criminal Code provides that:</p> <ul style="list-style-type: none">- the destruction and trade in protected species is considered as a crime and is punishable by up to five years imprisonment and a fine of up to 20,000 BGN.- Anyone who illegally destroys, acquires, holds or appropriates a specimen of protected wild flora or fauna species, unless the act is negligible, shall be punishable by imprisonment of up to three years or probation, as well as a fine from 2,000 to 10,000 BGN.

- Anyone who trades in specimens of protected wild flora or fauna species or parts or derivatives thereof, unless the act is negligible, shall be punishable by imprisonment of up to five years and a fine from 2,000 to 20,000 BGN.
- When the act under results from negligence, the culpable party shall be punishable by probation and a fine from 1,000 to 5,000 BGN.
- Anyone who illegally destroys, acquires, holds or expropriates a specimen of Europe-wide or globally endangered wild vertebrates or a specimen of any species under Appendix 3 to the Biological Diversity Act bearing the symbol (*) shall be punishable by imprisonment of up to five years and a fine from 5,000 to 20,000 BGN.

Denmark

From a warning to a maximum of 1 year imprisonment

France

The Law for the Recovery of Biodiversity, Nature and Landscapes (2016) strengthens sanctions for illegal trade. According to Articles L415-3 and L415-6 of the Environment Code, trafficking in protected species is liable to a fine of € 150,000 and two years' imprisonment. These penalties may be increased to € 750,000 and seven years imprisonment for organised trafficking.

There is also a laundering offense (Article 3241 of the Criminal Code), for which punishments can be 5 years imprisonment and a fine of € 375,000 or a 10-year prison term and a fine of € 750,000 in the event of an aggravating circumstance.

The Customs Code also provides for additional sanctions (Articles 415 and 415-1 of the Customs Code). Trafficking in protected species shall be liable to imprisonment for a term of three years, confiscation of the object of fraud, means of transport, property and assets that are the direct or indirect proceeds of the infringement, and a fine of between one and two times the value of the object of fraud. The Customs Code also provides that when committed in an organized manner, imprisonment may be for up to ten years and a fine of up to ten times the value of the subject-matter of the fraud.

Georgia

Fine for illegal wildlife trade, including pangolin species, is 2000 GEL (around 800 USD). At the moment there is no range for different species though Georgia plans to set range of fines for different offences.

Greece

According to Greek legislation there are administrative sanctions and criminal penalties. The offenders are punished with a fine from 1.500 Euros up to 30.000 Euros and the illegal traded species are seized. Also anyone who trades illegally is facing 2 months up to 1 year imprisonment and 2 years imprisonment in case of relapse.

Italy

Illegal activities concerning specimen listed in Annex B of the Council Regulation 338/997 are punished according the law n. 150/1992, art. 2:

- financial penalty: from € 10.329,00 to € 103.291,00;
- detention from three to twelve months.

Japan

For illegal trade, any person who has exported or imported pangolin specimens without obtaining permission could be punished by imprisonment with labour for not more than 5 years or a fine of not more than 5 million yen, or both.

For any other illegal activity, any person who has illegally transferred, delivered or received individuals or products thereof, which maintain the entire form of individual, could be punished by imprisonment with labour for not more than 5 years or a fine of not more than 5 million yen, or both.

Latvia	National law and EU legislation foresees confiscation of all illegally acquired specimens of CITES species. Administrative fines in case of illegal trade in endangered species are in range from 70 to 700 Euro for private persons and from 140 to 1400 Euro for legal persons. In case particular illegal activity with endangered species (illegal trade, poaching and other forms) can be classified and proved as serious crime criminal liability is foreseen in criminal code.
Montenegro	Fine of €50-5,000 for physical persons, €5,000-50,000 for legal persons. This applied to all species, not pangolins specifically.
Netherlands	Minimum penalties are not applicable. The maximum penalties include: 6 years of detention or a fine of max. €82.000.
Slovakia	Penalties according to the Customs Act (trade with third countries): up to 99.581,75 € - for legal persons (companies, businessmen) up to 3.319,39 € - for natural persons The specimen can be sized and confiscated. Penalties according to the Act 15/2005 on the protection of species of wild fauna and flora by regulating trade therein (internal trade) 80 - 66.000 € - for legal persons (companies, businessmen) 16,59 - 19.916 € - for natural persons The specimen can be sized and confiscated. According to Criminal Act: imprisonment – up to 8 years.
Spain	Maximum penalties that may be imposed under the law of repression of contraband: The imposition of an administrative sanction of contraband implies the confiscation of the intervened specimens smuggled, a fine pecuniaria and the closing of the establishment where the contraband has been committed during a period of time. The following table summarizes both the fines and the duration of the closure of the establishment according to certain parameters: Value of the goods = less than 1000 € Classification of the infringement = LIGHT Fine = From 200 to 225% of the value of the genus Duration of the closure of the establishment where the infringement was committed = From 4 days to 3 months Value of the goods = From € 1000 to € 4,507.59 Classification of the infringement = GRAVE Fine = From 225 to 275% of the value of the genus Duration of the closure of the establishment where the infringement was committed = From 3 months and 1 day, to 9 months Value of the goods = From € 4,507.59 to € 12,000 Classification of the infringement = GRAVE Fine = From 225 to 275% of the value of the genus

Duration of the closure of the establishment where the infringement was committed = From 3 months and 1 day, to 9 months

Value of the goods = From € 12,000 to € 13,522.77

Classification of the infringement = VERY SERIOUS

Fine = From 275 to 350% of the value of the genus

Duration of the closure of the establishment where the infringement was committed = From 9 months and 1 day to 12 months

Value of the goods = From € 13,522.77 to € 18,030.36

Classification of the infringement = VERY SERIOUS

Fine = From 275 to 350% of the value of the genus

Duration of the closure of the establishment where the infringement was committed = From 9 months and 1 day to 12 months

Value of the goods = From € 18,030.36 to € 50,000

Classification of the infringement = VERY SERIOUS

Fine = From 275 to 350% of the value of the genus

Duration of the closure of the establishment where the infringement was committed = From 9 months and 1 day to 12 months

As far as smuggling offenses are concerned, penalties foresee the confiscation of the goods processed, imprisonment between 1 and 5 years, additional pecuniary fines between 100 and 600% of the intervention, and additionally suspension for a period of between 6 months and 2 years of import, export, or trade activities of the category of contraband goods.

In addition, article 332 of the current Criminal Code establishes a sentence of six months to two years imprisonment and a fine of eight to twenty-four months and special disqualification for a profession or trade for a period of six months to two years for those who traffic with protected plant species wild.

Moreover, article 334 of the current Penal Code establishes a sentence of six months to two years imprisonment and a fine of eight to twenty-four months and special disqualification for profession or trade and disqualification from hunting for a period of two to four years for whom Traffic with protected species of wildlife.

Sweden	4 years imprisonment
Switzerland	Under the Federal CITES Law, the maximum penalty is CHF 40,000 or up to three years imprisonment.
Tunisia	Where a person is convicted of poaching, illegal trade, illegal possession or any other illegal activity involving specimens of CITES-listed species, they shall be punished by imprisonment for between 16 days and 6 months and receive a fine between 500 to 5000 dinars.
United Arab Emirates (UAE)	Since pangolins are listed in App. II, the penalty is imprisonment for not more than 3 months and a financial fine of minimum 5,000 AED and maximum 30,000 AED or one of these two penalties.
United States	The United States Endangered Species act currently lists <i>Manis temminckii</i> as Endangered. This listing prohibits import, export, and interstate and foreign commerce of <i>M. temminckii</i> , including parts and products without an ESA permit for any person under the jurisdiction of the United States.

Endangered Species Act, including CITES, and Supporting CFR

- Civil penalty (strict liability, any person who violates)
 - \$500 civil penalty
- Civil penalty (any person who knowingly violates)
 - Fines up to \$25,000 for endangered species
 - Fines up to \$12,000 for threatened species
- Criminal misdemeanor (specific intent, knowingly, no ESA Felonies)
 - Endangered: Maximum 1 year in prison
- Fines up to \$100,000 for individuals
- Fines up to \$200,000 for businesses
 - Threatened: Maximum six months in prison
- Fines up to \$25,000
- Forfeiture
 - Civil: Fish, wildlife and plants subject to forfeiture.
 - Criminal: Fish, wildlife, plants, vehicles, aircraft, equipment, etc., subject to forfeiture.

Lacey Act

- Criminal felony – up to 5 years of imprisonment
 - Fines up to \$250,000 for individuals
 - Fines up to \$500,000 for organizations
- Criminal misdemeanor – up to 1 year of imprisonment
 - Fines up to \$100,000 for individuals
 - Fines up to \$200,000 for businesses
- Civil penalty
 - \$10,000 or maximum of predicated law
 - \$250 for marking violations
- Forfeiture

Fish, wildlife, plants, weapons, vehicles, aircrafts, etc. subject to forfeiture.

Table 4. Regulations for managing, storing and disposing of confiscated pangolin specimens based on responses to Notifications to the Parties No. 2017/035 and 2014/059. It was beyond the scope of this report to include a full and comprehensive list of relevant legislation from all 183 Parties to the Convention.

Party	Description of regulation/standard operating procedure
ASIAN RANGE STATES	
China	China reported in its response to Notification to the Parties No. 2014/059 that it has established regulations but didn't provide further details (though see Table 2 in this Annex regarding regulation on the storage and use of scales).
India	<p>The Wild Life (Protection) Act, 1972 has provisions for disposal of confiscated meat, and uncured trophies can be disposed of by the authorized officer in the prescribed manner. It also has provisions for captive animals in respect of which an offence is found to have been committed will stand forfeited to the government.</p> <p>Indian zoos can acquire or transfer Pangolin only with the previous permission of the CZA and no zoo can acquire, sell or transfer any wild or captive animal except from or to a recognised zoo. Every animal which dies in a zoo is required to be subjected to a detailed post mortem examination by a registered veterinarian to determine the cause of death. Every zoo is required to maintain record of the births, acquisitions, deaths and disposals of animals of each species in its collection in the manner and in the format determined by the CZA. The inventory for each financial year is required to be submitted to the CZA by 30th April of the ensuing year in the prescribed form.</p>
Indonesia	Standard operating procedures are in place for confiscations of all wildlife (as opposed to pangolin specific). There are various regulations, including the Ministry of Forestry Decree No. 4 (2010) on Handling Forestry Crime Evidence which covers wildlife crime and the scope of the regulation includes classification of evidence and procedures for evidence management. The regulation 'Director-General of Forest Protection and Nature Conservation No. 11 (2014) on Destruction of Findings, Confiscated and Spoils Evidences' includes a focus on management of evidence, destruction of evidence, and finances.
Malaysia (Peninsular)	Live pangolins are released as soon as possible. Pangolin products are kept in a safe room/vault.
Malaysia (Sarawak)	Live pangolins are kept at Wildlife Centres while trophies/products are disposed of after any court cases are settled.
Myanmar	Though there are no comprehensive regulations or standard operating procedures for managing, storing, and disposing of confiscated pangolin specimens, according to the Protection of Wildlife and Protected Areas Rules (2002). However, Myanmar has some rules for confiscated specimens including pangolins as follows: 68 - The Court, on finding guilty with respect to any offence prosecuted under this Law, shall, in addition to the penalty prescribed for the relevant offence, - (a) pass the order to cause payment of compensation to the Forest Department for the value of the loss of property of the Forest Department caused by the offender. (b) confiscate the wild

animals, natural plants and parts thereof involved in the commission of the offence and shall hand them over to Forest Department. (c) pass an order to confiscate the vehicles, animals and other properties and implements involved, in the commission of the offence. 69. The Forest Officer or the Administrator shall accept protected wild animals and parts thereof and protected natural plants and parts thereof that are handed over after confiscation by the Court. 70. The State/ Divisional Forest Officer has the authority to sell the protected wild animals and parts thereof and the protected natural plants parts thereof that are handed over after confiscation by the Court in accordance with the stipulation.

Nepal	The government of Nepal has implemented the Wildlife Stockpiles Management Procedure (2072) to manage wildlife stockpiles which includes the provision to manage pangolin parts and derivatives.
Pakistan	Under the law, live specimens of any wildlife are usually released in nature for rehabilitation or shifted to zoos depending upon feasibility. The confiscated parts/products are disposed of under relevant provincial wildlife legislation depending upon nature of specimens, and on decision by the court.
Philippines	For live specimens the following guidelines are followed: DENR Administrative Order 97-17 of April 29, 1997 - Establishing the Disposition Program for Confiscated and Donated Wildlife in the Custody of DENR Wildlife Rescue Centers and Similar DENR Facilities and Providing Guidelines. For dead specimens: tissue samples are collected for DNA analysis through wet preservation (in formaldehyde) or disposal through burying.
Singapore	All confiscated live wildlife (including pangolins) are sent to Wildlife Reserves Singapore for temporary custody pending further investigations. For parts and products, the specimens will be confiscated under AVA's custody. Upon conclusion of investigations, specimens confiscated will be disposed in accordance to CITES Res. Conf. 10.7 and Res. Conf. 9.10.
Thailand	Regulation on the management of wild animals carcasses is entrusted to the State in Regulation B.E. 2540
Viet Nam	Decision 90/2008/BNN sets out procedures for managing, storing, and disposing for all endangered wild animal confiscated from illegal trade.

AFRICAN RANGE STATES

Benin	Species in category A of wildlife legislation are seized and sent research centers like the botanical garden of the University of Abomey or are released in their habitats in reserves.
Cameroon	Seized pangolin scales are kept in a store provided for this purpose in Yaoundé.
Gabon	Article 278 of Law 016/2001 of 31 December 2001 on the Forestry Code of the Gabonese Republic stipulates that seizures of game animals taken from anti-poaching missions are destroyed after sanitary control in a laboratory

approved by the State Or deposited in public establishments, at the end of each operation, in the presence of judicial police officers.

In the absence of a quality analysis structure and in the interest of food security, the seizures are systematically destroyed and legal proceedings are instituted against the offenders.

The scope of decree 0163/PR/MEF of 19 January 2011 on the conditions for the possession, transport and marketing of wild animal species, trophies and products of hunting covers the species of pangolins present on the national territory. Accordingly, Articles 3 to 9 deal specifically with the possession and transport of hunting products prohibited for species that are fully protected and subject to authorization for partially protected species. Since 2014, scales have been stored and used for training dogs in the Canine Conservation Support Unit (UCAC) of the National Agency of National Parks (ANPN).

Kenya	Live pangolins would be relocated back to their wild habitat upon certification by the vet department of Kenya Wildlife Service regarding zoonotic diseases. Products and/or derivatives are destroyed upon stringent approval by various agencies of the government of Kenya.
Namibia	All confiscated wildlife products are taken to the Ministry of Environment and Tourism head office for safe keeping. All seized live pangolins are released in National Parks.
Nigeria	Live animals are taken to rescue centres. Pangolin scales are held by the National Environmental Standard Regulatory Enforcement Agency (NESREA).
Senegal	Regulations and laws are outlined in the hunting code.
Zambia	Confiscated live pangolins, just like other live specimens are as practicable as possible taken to court for official disposal. Once formalities are concluded, the animal is taken to a suitable location, in most cases; the animal is taken back to the wild.

NON-RANGE STATES

Bulgaria	Standard Operating Procedures are outlined in national legislation. No particular amendments for pangolins have been approved.
Italy	According to the Italian legislation, as for all other species, stockpiles of pangolin products and parts are managed by Corpo forestale dello Stato, in charge of their keeping and conservation. Live animals are disposed by CITES Management Authority according to Scientific Authority advise.
Japan	If CITES-listed animals, including pangolins, are confiscated by Japan Customs, the CITES Management Authority of Japan consults with the exporting country about returning these animals. If the exporting country declines to accept the animals, they are treated based on the domestic law of Japan.
Latvia	There is no specific procedure established for managing, storing and disposing of confiscated pangolin specimens but standard procedure is established for all CITES species. This procedure foresees that all confiscated live specimens of CITES listed animal species are kept in

national zoological garden but processed specimens can be used for public education purposes or disposed.

Netherlands	Seized items are stored by the government at authorised keepers.
Slovakia	<p>According to Article 26 of the Act No 15/2005 on the protection of species of wild fauna and flora by regulating trade therein all confiscated specimens (not only pangolin specimens) are property of the state.</p> <p>Specimens in the state ownership may be</p> <ul style="list-style-type: none">a) returned to the wild, if it is possible and effective,b) returned to the State from which they have been imported into the territory of the Slovak Republic in contradiction to this Act or Regulation³ after consultation with a management authority of the State of export,c) after consultation with a management authority of another Member State of the Community returned to this state if they have been moved from this state in contradiction to this Act or Regulation³,d) placed in a rescue centre⁴⁵,e) used for the tasks resulted from an adopted programme of conservation of a given species,f) used for research aimed at the protection and conservation of a given species,g) used for collecting and educational activities of museums, scientific institutions and universities,h) used for educational purposes of the state administration authorities,i) transferred to another natural person or legal entity. The provision of paragraph 5 is not affected thereby,j) liquidated, if dead specimens cannot be utilised otherwise,k) used in another means according to a decision of the Ministry.
Spain	Regulation applicable to seized specimens are general are detailed in Royal Decree 1333/2006.
United Arab Emirates (UAE)	The procedure varies depending on whether a live pangolin or products is seized. No further information was provided.
United States	Detailed in Code of Federal Regulations (50) 12, Seizure and Forfeiture Procedures, which applies to live specimens and parts and products.
