

Nijman, V, Zhang, M and Shepherd, C

Pangolin trade in the Mong La wildlife market and the role of Myanmar in the smuggling of pangolins into China.

Nijman, V, Zhang, M and Shepherd, C (2016) Pangolin trade in the Mong La wildlife market and the role of Myanmar in the smuggling of pangolins into China. *Global Ecology and Conservation*, 5 . pp. 118-126.

doi: 10.1016/j.gecco.2015.12.003

This version is available: <https://radar.brookes.ac.uk/radar/items/2114f8b4-eec8-4db3-bbf0-f30834d86247/1/>

Available on RADAR: August 2016

Copyright © and Moral Rights are retained by the author(s) and/ or other copyright owners. A copy can be downloaded for personal non-commercial research or study, without prior permission or charge. This item cannot be reproduced or quoted extensively from without first obtaining permission in writing from the copyright holder(s). The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the copyright holders.

This document is the published version of the journal article.



## Original research article

## Pangolin trade in the Mong La wildlife market and the role of Myanmar in the smuggling of pangolins into China

Vincent Nijman<sup>a</sup>, Ming Xia Zhang<sup>b</sup>, Chris R. Shepherd<sup>c,\*</sup><sup>a</sup> Oxford Wildlife Trade Research Group, Oxford Brookes University, Oxford, UK<sup>b</sup> Xishuangbanna Tropical Botanical Gardens, Chinese Academy of Sciences, Mengla, China<sup>c</sup> TRAFFIC, Petaling Jaya, Malaysia

## ARTICLE INFO

## Article history:

Received 7 November 2015

Received in revised form 18 December 2015

Accepted 18 December 2015

Available online 29 December 2015

## Keywords:

Burma

CITES

Conservation

Manis

Wildlife trade

## ABSTRACT

We report on the illegal trade in live pangolins, their meat, and their scales in the Special Development Zone of Mong La, Shan State, Myanmar, on the border with China, and present an analysis of the role of Myanmar in the trade of pangolins into China. Mong La caters exclusively for the Chinese market and is best described as a Chinese enclave in Myanmar. We surveyed the morning market, wildlife trophy shops and wild meat restaurants during four visits in 2006, 2009, 2013–2014, and 2015. We observed 42 bags of scales, 32 whole skins, 16 fetuses or pangolin parts in wine, and 27 whole pangolins for sale. Our observations suggest Mong La has emerged as a significant hub of the pangolin trade. The origin of the pangolins is unclear but it seems to comprise a mixture of pangolins from Myanmar and neighbouring countries, and potentially African countries. Myanmar, on the basis of its geographic position, size and weak government, has emerged as an important transit country for the smuggling of pangolins to China. Data from 29 seizures from Myanmar and 23 from neighbouring countries (Thailand, India, China) implicating Myanmar as a source of pangolins or as a transit point for pangolins sourced in other countries, in the period 2010–2014, illustrate the magnitude of this trade. Combined these seizures amount to 4339 kg of scales and 518 whole pangolins, with a retail value in Myanmar of US\$3.09 million. Trade in pangolins, their parts or their derivatives is illegal in Myanmar and CITES II listing with a zero-quota preclude international trade in them. We urge the Myanmar government to liaise with regional authorities to curb the trade in pangolins and recommend that the Myanmar and Chinese CITES authorities in particular come together urgently as to resolve the illicit trade of pangolins and their parts across their borders.

© 2015 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Trade in pangolins is seen as a major impediment for their conservation, especially so for the four Asian species but increasingly for the four African species as well. The primary threat is poaching for international trade, which is largely driven by demand in China, and to a lesser extent Vietnam, and involves live animals, their meat and scales (Pantel and Chin, 2009; Shepherd, 2009). In China and Vietnam increasing wealth appears to have led to significant rise in the exploitation of pangolins across Asia (Challender and Hywood, 2011; Pantel and Chin, 2009) and, more recently, Africa (Challender and

\* Correspondence to: TRAFFIC Southeast Asia, Unit 3-2, 1st Floor, Jalan SS23/11, Taman SEA, 47400 Petaling Jaya, Selangor, Malaysia.  
E-mail address: [chris.shepherd@traffic.org](mailto:chris.shepherd@traffic.org) (C.R. Shepherd).

Hywood, 2012; Baker, 2014). Pangolin meat is consumed as a luxury dish and scales are used in traditional Asian medicine, purportedly curing a range of ailments.

Sharing a 2185 km long and often porous border with China, having strong economic ties to China and high levels of corruption, Myanmar is a gateway for a wide variety of illegally transported wildlife into China (Oswell, 2010; Nijman and Shepherd, 2014; Sharma, 2014; Nijman and Shepherd, 2015). We focused on the town of Mong La, in the eastern part of the country on the border with China, and a well known centre for wildlife trade (Davies, 2005; Peterson, 2007; Shepherd and Nijman, 2007; Oswell, 2010; Felbab-Brown, 2011; Nijman and Shepherd, 2014, 2015), to assess the trade in pangolins and their parts.

There are three species of pangolin native to Myanmar. In eastern Myanmar two species of pangolin are present, i.e. the Sunda pangolin *Manis javanica* and the Chinese pangolin *M. pentadactyla*, and some 1000 km to the west, the Indian pangolin *M. crassicaudata* can be found. Both the Sunda and the Chinese pangolin are listed as Critically Endangered (Challender et al., 2014a,b) and the Indian pangolin is listed as Endangered (Baillie et al., 2014). All are primarily threatened by over-exploitation.

Pangolins are a totally protected animal under Myanmar's Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law of 1994. Killing, possessing, selling, transporting or transferring (including exporting) totally protected wildlife, or any part thereof, without permission, is punishable with imprisonment for up to seven years and/or a fine of up to MMK 50,000 (USD 8183) (Naing, 2009). In China, pangolins (both native and non-native species) are listed as Class II Protected Wildlife Species under the Wildlife Protection Law; the hunting and trade of pangolins within China are managed by provincial forestry bureau. In 2008 the Chinese government issued a regulation pertaining to the sale of pangolin scales in stock: these scales need to be registered and marked individually, and can only be sold in accredited hospitals, and thus are of little relevance to the trade as observed on the China–Myanmar border, as pangolin products in Mong La are clearly not part of this regulated system. Trading pangolins or their parts is considered a criminal offence in China: penalties depend on the seriousness of the offence and the value of the parts. For instance an offender smuggling up to eight pangolins or parts valued between RMB 100,000 and 200,000 (USD 16,250–32,500) shall be liable to fixed-term imprisonment of not less than five years and concurrently to a fine. Smuggling parts valued over RMB 200,000 is considered an 'especially serious offence' carrying a penalty of life imprisonment or death (Zang, 2009). All species of pangolin are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), meaning that all international trade is subject to the provisions provided by the Convention. However, since 2000 a zero annual export quota has been established for the four Asian species for specimens removed from the wild and traded for primarily commercial purposes. All range countries of pangolins, including Myanmar and China, are Party to CITES, and in principle the adoption of a zero-quota should have led to a non-existent international trade in Asian pangolins.

The only study thus far about pangolin trade in Myanmar in recent years appears to be Naing (2009), who reported that the Myanmar authorities had made five seizures in 2006 and 2007 (mostly in Mandalay) totalling 233 skins and one live individual. Studies from neighbouring China and India suggest a more prominent role of Myanmar but this has yet to be quantified. Zhou et al. (2014) reported on seizures of pangolins made in China's Yunnan province in the period 2010–2013 (i.e. 2592 kg scales, 259 whole pangolins). The province of Yunnan shares its border with Myanmar, Lao PDR and Vietnam, and an unknown proportion of the pangolins seized in Yunnan may have been derived from Myanmar or may have passed through Myanmar. Mohapatra et al. (2015) recently gave an overview of the pangolin trade in India from the period 2009–2014, again largely based on seizure data, and presented strong evidence of trade links between India and Myanmar and India, Myanmar and China.

## 2. Methods

### 2.1. Study area

Mong La is situated in one of 24 Special Development Zones ('Special Region 4'), designated in 2001 as part of an overall plan to reduce poverty, raise the standard of living, and narrow the gap between urban and rural areas (ADB, 2006). Special Region 4 is controlled by the Sai Leung (Chinese name Lin Min Xiang) and policed by the 3000 strong National Democratic Alliance Army of the Eastern Shan State (Oswell, 2010); the Myanmar central government have limited authority in Mong La. Mong La's position on the border with China's Yunnan Province allows for cross-border trade with China. Starting in June 1989, when Special Region 4 was granted virtual autonomy, the town was developed by Chinese investors and focuses on the entertainment industry, with numerous nightclubs, karaoke lounges, exotic meat restaurants and 24-hour casinos (Davies, 2005; Nijman and Shepherd, 2014); several venues in Mong La offer sex services, as well as gaming and alcohol. A prominent gay establishment with live sex shows at the outskirts of the town (Beyrer, 2001) has closed down. The surrounding countryside has seen an increase in cash crop production (with large stands of rubber and bananas) as to supply the Chinese market. While Mong La is situated within Myanmar its outlook is firmly directed to China. About 80% of the people working and living in the area are Chinese. Chinese (Mandarin/Putonghua) is spoken widely in Mong La, all signs are in Chinese characters, the mobile phone network and electricity providers are Chinese, and the Chinese Yuan Renminbi (RMB), and not the Myanmar Kyat, is the currency of daily use. Local time follows Beijing Standard Time and is 1.5 h ahead of the rest of Myanmar.

## 2.2. Data acquisition and analysis

We visited Mong La on four occasions, 6–7 February 2006 (VN and CSR plus an obligatory guide from Mong La), 26–28 February 2009 (CSR with Adam Oswell plus guide from Tachilek District), 31 December 2013 and 1–2 January 2014 (VN and CSR plus guide from Tachilek District), and 6 March 2015 (VN and MXZ, plus guide from Mong La). We surveyed the wildlife morning market in the centre of town, specialised wildlife shops selling trophies and skins, and wild meat restaurants (not in 2009 or 2015). In 2013–2014 we additionally visited the casinos that are situated some 10 km west of the main town. Photos were taken opportunistically, especially in the open market but photography was not permitted in the specialised shops or the casinos.

Sunda, Chinese and Indian pangolin can be distinguished by the size of their ear pinna, the scaling pattern on the tip of the tail, the number of scale rows, the presence or absence of pads on the soles of their feet, and, to a lesser extent, their overall body size (Smith and Xie, 2008; Shepherd and Shepherd, 2012). While the largest scales of an Indian and Chinese pangolin are always larger than the largest scales of a Sunda pangolin, there is considerable overlap between all but the largest scales. In the markets, when scales are displayed individually, or more commonly in plastic bags, we found it difficult to reliably distinguish between species. Live individuals were almost invariably caged thus not allowing us to inspect them morphologically. As such we did not distinguish between the different species.

In order to estimate the number of pangolins in trade, for each trip we estimated the minimal number of pangolins on display. Whole skins were counted as the equivalent of one pangolin; a foetus was counted as one; and for bags of pangolin scales we assumed that these contained the scales of between one and three pangolins each (i.e. with an estimated 0.5–1.5 kg of scales per bag). Following data from a wide range of sources presented by Challender et al. (2015) we assume that Chinese and Sunda pangolins have an average mass of 5.0 kg (of which 0.5 kg scales) and Indian pangolins have an average mass of 6.5 kg (of which 1.0 kg scales).

In June 2015 we searched the CITES trade database for records of cross-border trade of pangolins between Myanmar and China, for the period 1975–2013 (no data were yet available for 2014 or 2015). Seizure data can give a good indication of the trade flows of pangolins (e.g. Nijman, 2015) and thus we conducted a systematic search, using TRAFFIC's seizure database and online searches, for pangolin seizures (post-2010) in Myanmar or in neighbouring countries (India, Thailand, China) where Myanmar was explicitly implicated as a source, a destination or a transit country. Finally, seizure data was requested from the Myanmar Forestry Department.

Attaching a monetary value to the trade in pangolins in Myanmar is fraught with difficulties. While the price of scales and skins can be reliably extrapolated to larger volumes, this is more complicated for the trade in live pangolins, pangolin meat or pangolin wine. Live pangolins in Mong La, and indeed other wildlife trade centres in Myanmar, are mostly displayed in front of restaurants or casinos and are purchased not whole but as part of a dish. Likewise, pangolin wine is purchased by the glass or by the bottle, and the price holds little relationship with the number of pangolins emerged in the wine. Based on information collected during surveys in 2014–2015, we used a retail price of RMB 2000 (USD 326) for a whole skin, RMB 3000 (USD 489) for a kg of scales, and 11,500 (USD 1875) for a whole pangolin (that is RMB 10,000 for the meat and RMB 1500 for 0.5 kg of scales) for the trade in, from and to Myanmar. Prices in China are considerably higher (Zhou et al., 2014; Challender et al., 2015) and we take it that wholesale prices (when for instance scales are purchased in bulk) can be considerably lower.

## 3. Results

### 3.1. Trade in pangolins in Mong La

We recorded 42 bags of pangolin scales, 25 whole skins, and one single detached pangolin head. With respect to whole pangolins we recorded 27 live pangolins, and 16 pangolin carcasses, including foetuses, emerged in wine. Spatially the trade in whole pangolins was largely separated from the trade in skins and scales, with the trade in scales taking place almost exclusively in the central market, the trade in whole skins in the central market and the specialised wildlife shops, and the trade in whole live pangolins in front of the restaurants and the casinos outside town (see Table 1 and Fig. 1). The retail value of the pangolins observed in trade in Mong La amounts to RMB 750,000 or some USD 122,000.

For the period 1975–2013, China (excluding Hong Kong SAR, Macao SAR or Taiwan PoC) or exporting countries reported a moderate amount of trade in pangolins to the CITES Secretariat. In 2000, Malaysia reported the export of 50 Sunda pangolins to China (none were reported as being imported by China) and between 1994 and 2012 Singapore and Hong Kong SAR reported the re-export of 10,400 kg of Sunda pangolin scales originating from Malaysia to China (8300 kg was reported by China as being imported). Between 1999 and 2002 China reported the import of 2160 pangolin skins from Singapore, Hong Kong and Japan (only Japan reported the export of 10 kg of pangolin skins to China), with 93% of them being identified as Sunda pangolins from Malaysia. China appears to have never reported the import (or seizure) of pangolins from Myanmar to the CITES Secretariat, and likewise, Myanmar has never reported the export of pangolins to China (or indeed any other country in the world).

**Table 1**

Trade in pangolins in Mong La, Myanmar. The central wet market, wildlife shops and wild meat restaurants are all situated in the town proper, whereas casinos refer to a series of casinos and gambling dens situated some 10 km west of the town and not to the ones in town.

Location	Item	2006	2009	2013–2014	2015	Total
Central market	Bags of scales	4	5	15	18	42
	Whole skins	1	1	10	13	25
	Live	3	0	1	0	4
	Head	1	0	0	0	1
Wildlife shops	Whole skins	0	0	5	3	8
	Carcass in wine (incl. foetuses)	0	0	3	10	13
Restaurants	Live	n/a	n/a	10	n/a	10
	Carcass in wine (incl. foetuses)	n/a	n/a	3	n/a	3
Casinos	Live	n/a	n/a	13	n/a	13

#### 4. Myanmar as a route of pangolins into China

Pangolins are regularly seized in Myanmar; we found 29 seizures for the period 2010–2015. Many are small, with the largest involving the confiscation of 47 live pangolins in Thahton some 120 km from the Myanmar–Thai border and 812 kg of scales in Theindi, Shan State some 100 km from the Myanmar–China border. The total number amounts to almost 1600 kg of scales and 220 whole pangolins (dead or alive). An equally large number of seizures linked to Myanmar were reported from India, all but one comprising pangolin scales, including some involving substantial volumes. While the largest seizure was made in Kolkata along the east Indian coast, the majority of seizures came from the states of Mizoram and Manipur, both bordering Myanmar. One seizure of 150 live pangolins, reportedly from Myanmar, was made in northern Thailand. Ten seizures were made in China, comprising scales, whole dead pangolins and live ones, mostly from Yunnan province, bordering Myanmar. Combining the seizure data over this 5 years period amounts to 4339 kg of pangolin scales and 518 whole individuals, for a combined total of some 7109 pangolins. The value of this trade when retailed in Myanmar amounts to some RMB 18.97 million or USD 3.09 million. These data from neighbouring countries suggest that Myanmar is a more important country in the smuggling and illegal trade in pangolins than seizure data from Myanmar itself suggests (Fig. 2).

When mapping all the locations where pangolins have been seized in Myanmar as well as the border regions of India, China and Thailand, the major trade routes and border crossings become apparent (Fig. 2). The Indian border town of Tamu appears to be an important gateway for the transfer of pangolins from the Indian Subcontinent into Myanmar, whereas the Three Pagoda Pass and the road linking Kawkaireik in Myanmar's Kayin State to Mae Sot in Thailand facilitate the transfer of pangolins from Myanmar into Thailand. Once in Thailand, the highway linking these western towns to Chiang Mai and further to the border crossing between Mae Sai and Tachilek in Myanmar's Shan State allows pangolins to be exported to China via Mong La. The bridge between the cities of Muse and Ruili is an important gateway for the pangolin trade into China.

#### 5. Discussion

##### 5.1. Origin

While we were not able to obtain firm data on the localities or even countries where the pangolins observed in Mong La were harvested, some inferences can be made on the basis of contextual data. The goods are displayed on mats or pieces of cardboard on the ground, and loose items (such as pangolin scales) are packed in regular plastic bags. There are no storage facilities or options to lock high-value items. In the morning market we have recorded over 50 different bird, mammal and reptile species for sale, and with the exception of two live Alligator snapping turtles *Macrochelys temminckii*, original from North America but now bred in large numbers in other parts of the world, all these species are native to Myanmar. We therefore consider it likely that the majority of pangolins, and their scales and skins for sale in Mong La's morning market are derived from within Myanmar.

The high-end trophy and wildlife shops in Mong La are distinctly different. Goods are displayed in large glass display cases or in cabinets; loose items are properly boxed, and there are facilities to securely lock expensive items. The shops mostly have metal shutters to secure them at night. While a large number of the wildlife for sale could have originated from Myanmar, others must have been imported from elsewhere. These items include elephant *Loxodonta* spp and hippopotamus *Hippopotamus amphibius* ivory from Africa (Nijman and Shepherd, 2014), taxidermied tiger *Panthera tigris* skins from India (Shepherd and Nijman (2008)), white rhino *Ceratotherium simum* horn from Africa, Tibetan antelope *Pantholops hodgsonii* and bhalar *Pseudois naysaur* from the Himalayas, helmeted hornbill *Rhinoplax vigil* casks and ivory from insular Southeast Asia. It is possible that at least some of the pangolin items we observed in these shops originated from outside Myanmar, i.e. most likely India or other parts of Southeast Asia or even parts of Africa.

Finally the wild meat restaurants and the casinos, the latter of which are outside the town proper. The number of pangolins needed on a daily basis for these commercial enterprises is higher than that in the morning market or in the wildlife trophy shops. Pangolins are delivered by small delivery vans in cages stacked on top of each other, and, according

**Table 2**

Selection of seizures of pangolins in Myanmar, or in India or Thailand where Myanmar has been implicated, in the period 2010–2015. TRAFFIC refers to seizure data stored in a database managed by TRAFFIC Southeast Asia, Petaling Jaya.

Date	Volume	Where	Notes	Source
<b>Myanmar</b>				
1 ii 2010	812 kg scales	Theindi, Shan State		TRAFFIC
29 iii 2010	5 alive	Kyine Ton, Shan State		TRAFFIC
11 iv 2010	1 whole	KyunZu, Taninthayi Region		TRAFFIC
17 xii 2010	46.4 kg scales	Taunggot, Rakhin State		TRAFFIC
3 ix 2010	13 alive	Bahan, Yangon Region		TRAFFIC
17 ix 2010	2 alive	Myeik, Tanintharyi Region		Anon (2010a)
21 i 2011	7 alive	Phaung Taw, Bago Region		TRAFFIC
6 ii 2011	150 kg scales	Muse, Shan State		TRAFFIC
27 iii 2011	4 whole	Kun Hein, Shan State		TRAFFIC
30 iii 2011	4 alive	Kyine Ton, Shan State		TRAFFIC
6 vi 2011	4 whole	Ye, Mon State		TRAFFIC
26 xii 2011	75 kg bodies, 8 kg scales	Laishio, Shan State		TRAFFIC
25 ii 2012	149 kg scales	Muse, Shan State		TRAFFIC
12 vii 2012	14 alive	Kyine Ton, Shan State		TRAFFIC
11 viii 2012	274 kg scales	–, Chin State		TRAFFIC
30 xi 2012	34 alive	–, Kayin State		TRAFFIC
8 xii 2012	112 kg scales	Chaung Oo, Sagaing State		TRAFFIC
22 xii 2012	42 alive, 6 whole	–, Mon State		TRAFFIC
31 v 2013	8 kg scales	–, Chin State		TRAFFIC
24 viii 2013	11.2 kg scales	–, Chin State		TRAFFIC
24 viii 2013	47 alive	Thahton, Mon State		Anon (2012d)
18 vi 2013	11 kg scales	Teetain, Chin State		Anon (2013b)
17 x 2013	2 alive	Lashio, Shan State		Anon (2013a)
21 ii 2014	2 alive	Taungoo, Bago Region		Anon (2014a)
10 iv 2014	0.5 kg scales	Yangon	Airport	TRAFFIC
17 vi 2014	3.2 kg scales	–, Chin State		TRAFFIC
28 vii 2014	1 alive	Naypyitaw		TRAFFIC
9 viii 2014	17 alive	–, Shan State		TRAFFIC
25 ix 2014	14.4 kg scales	–, Sagaing Region		TRAFFIC
<b>India</b>				
16 vi 2010	555 kg	Guwahati, Assam		Sharma, 2014
xi 2010	650 kg scales	Kolkata, West Bengal	Bound for Moreh, bordering Myanmar	Sharma, 2014
21 x 2011	144 kg scales	Aizawl, Mizoram	Two Myanmar man arrested	Anon (2012a)
2 xi 2011	14 whole	Chandel, Manipur	Bound for China via Myanmar	Mohapatra et al., 2015
5 v 2012	12 kg scales	Chandel, Manipur	Bordering Myanmar	Anon (2012e)
5 v 2012	12 kg scales	Bongyang, Manipur	Bound for Moreh, bordering Myanmar	Anon (2012e)
1 ix 2012	5 kg scales	Thamnapokpi, Manipur	Bound for Myanmar	Anon (2012b)
3 ix 2012	63 kg scales	Aizawl, Mizoram	Bound for Myanmar	Anon (2012c)
7 ix 2012	390 kg scales	Tuirial, Mizoram	Bound for Myanmar	Anon (2012a)
18 vii 2013	85 kg scale	Guwahati, Assam	Bound for Myanmar	Anon (2013c)
28 viii 2013	148 kg scales	Vairengte, Mizoram	Bound for Myanmar	Sharma, 2014
viii 2013	25 kg scales	Davanagere, Karnataka	Bound for Myanmar	Sharma, 2014
<b>Thailand</b>				
20 ii 2015	150 alive	Chang Mai, Chang Mai	From Myanmar, bound for China	Anon (2015)
<b>China</b>				
16 xii 2010	11 whole	Houqiao, Yunnan	Entered via Kampaiti	Anon (2010b)
11 v 2011	340 kg scales	Kunming, Yunnan	Heading to Guangxi	Anon (2011a,b)
v 2011	11 alive	Houqiao, Yunnan	From Myanmar	Anon (2011a,b)
24 ix 2012	307 kg scales, 87 alive	Longchuan, Yunnan		Anon (2012f)
10 vii 2013	0.1 kg scales	Houqiao, Yunnan	From Myanmar	Anon (2013d)
26 xi 2013	6 whole	Longchuang		Anon (2013e)
16 ii 2014	2.7 kg scales	Houqiao, Yunnan	From Myanmar	Anon (2014b)
iii 2014	6 whole	Dehong		Anon (2014d)
2 ix 2014	4 alive	Tengchong, Yunnan		Anon (2014c)
20 xii 2014	7 alive, 2 dead	Houqiao, Yunnan	From Myanmar	

to informants, arrive most likely daily. As with the high-end trophy and wildlife shops we consider it likely that, in addition to locally or regionally sourced pangolins, this trade involves pangolins from further afield.

## 6. Value of the trade

We observe only small amounts of pangolin scales and pangolins for sale in 2006 but the volumes increased over time. The fact that pangolins appear to be available daily is of high concern. The largest volumes were observed in 2013–2014,



**Fig. 1.** Pangolin trade in Mong La showing clockwise from top left (a, b) bags of pangolin scales in the central wet market (c) bags of pangolin scale and whole pangolin skin in the central wet market, (d) live pangolin in a cage awaiting slaughter in front of the wild meat restaurants.

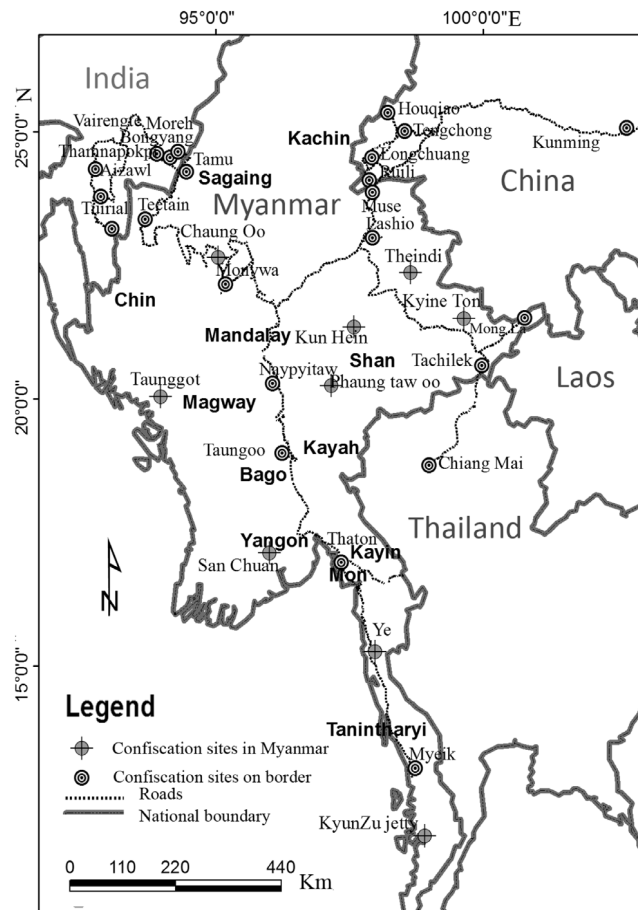
but given that the restaurants and casinos were not surveyed in 2015 volumes during the latest visit were equal or larger of that in 2013–2014. Given the prominence of the pangolins in trade during the later surveys it is highly unlikely that we would have missed significant quantities of pangolins during the first two surveys. This then suggests an increase in the prominence of pangolins in trade in Mong La, similar as observed for ivory (Nijman and Shepherd, 2014). All other reports of wildlife for sale from the period 2003 to 2005 (i.e. prior to our first visit) mention pangolins for sale but unfortunately none quantified volumes in trade (Davies, 2005; Felbab-Brown, 2011; Peterson, 2007). While the price of scales and skins can be reliably extrapolated to larger volumes, this is more complicated for the trade in live pangolins, pangolin meat or pangolin wine. Live pangolins in Mong La are mostly displayed in front of restaurants or casinos and are purchased not whole but as part of a dish. Likewise, pangolin wine is purchased by the glass or by the bottle, and the price holds little relationship with the number of pangolins emerged in the wine. Nevertheless, the combined retail value of the pangolins in Mong La makes the sale of pangolins an important economic contribution to the local economy, and certainly to those in control of the flow of pangolins.

We estimated the total value of the seized pangolins and their parts at over USD 3 million, or some USD 600,000 a year, when indeed retailed in Myanmar itself. This value will go up considerably once the pangolins have crossed over into China, where prices of pangolins and their parts have risen considerably over the last decade ((Challender et al., 2015).

### 6.1. Myanmar as a gateway of pangolins into China

The illicit trade in pangolins and pangolin scales flourishes in Mong La, perhaps in part as a reflection of the limited efforts by both the international community and the local authorities to tackle problems in the enforcement and compliance with existing laws and CITES regulations. However, the open availability of these easily recognisable totally protected animals or indeed their parts with apparent impunity may indicative of the lack of law enforcement in Mong La.

Law enforcement with respect to pangolins in Mong La seems to be extremely limited, if not totally absent. While Win Naing (2008) only lists five seizures for the years 2006 and 2007, three of which occur in Mandalay and only one (of a single pangolin) occurred at a border crossing, the data we managed to obtain on seizures in Myanmar suggests considerable more



**Fig. 2.** Myanmar as a transit country for the smuggling of pangolins to China. Shown are towns where pangolins have been confiscated and the main roads linking these towns.

Source: Data from Table 2 and Sharma (2014) and Win Naing (2008).

effort by the Myanmar enforcement agencies. Seizures of dozens of live pangolins as well as the seizure of considerable quantities of scales (often > 100 kg) suggest an ongoing trade within Myanmar. Unfortunately, despite these efforts, since joining CITES in 1997 Myanmar has never reported a single seizure of pangolins to the CITES secretariat. As such, on a global scale, Myanmar does not feature prominently in the international pangolin trade. Combining the Myanmar seizure data with those in India and China during the same time period, as depicted in Fig. 2, and inspection of the seizure reports (with Myanmar nationals linked to seizures in India and China and Chinese nationals involved in those made in Myanmar) strongly suggest that the majority of the trade of pangolins in Myanmar is to meet the demand for the Chinese market. This cross-border trade, by increasing vigilance at the borders and targeted enforcement efforts at times of increased trade (such as in the run up to Chinese New Year), does create opportunities for more efficient enforcement of both domestic and international legislation.

There are probably no easy solutions for curbing the trade in Mong La as multiple players are involved, each with their own agenda, reach and responsibilities. From a naive strictly legalistic viewpoint it is the central government in Myanmar that has the authority to deal with its internal wildlife markets, including Mong La. They furthermore have the responsibility to prevent any protected animal from leaving the country, whereas China has the moral and legal obligation not to allow it to enter its territory. In Mong La, however, for the last decades the central Myanmar government have little say in how it is ruled or governed. The local ruler Sai Leung, aided by the National Democratic Alliance Army of the Eastern Shan State, and other local rulers may have a greater influence, but it is unlikely they can operate without the (implicit or explicit) approval of China. Enforcement efforts need to be substantially increased, ideally with the backing of the Myanmar and Chinese central governments. We recommend that the Myanmar and Chinese CITES authorities come liaise urgently – joined if possibly by the local Mong La rulers – as to resolve the illicit trade of ivory and elephant parts across their borders.

The fact that Myanmar is clearly playing the role of a significant source country and transit point for pangolins being smuggled into China is of utmost importance. Efforts to curb the cross border trade, especially by Chinese border authorities, given the lack of regulation along much of the border from the Myanmar side, are absolutely essential. While China is clearly taking steps to crack down on the illegal pangolin trade, as illustrated by the significant penalties imposed on



smugglers, closing down the cross-border trade is key to choking off the black market trade within China, and ultimately to aid international efforts to save these species from extinction.

## Acknowledgements

We thank our guides, who have to remain anonymous, for their assistance, Adam Oswell for participation in the 2009 survey. Funding was received from the British Council and Xishuangbanna Tropical Botanical Gardens (VN, MXZ) and the Department of Social Sciences, Oxford Brookes University (VN) and Wildlife Reserves Singapore, Singapore. We thank TRAFFIC staff Sarah Stoner, Tiau Kiu Hwa and Guo Yanyan for providing us with seizure data and Tiau Kiu Hwa again for assistance with translations. We also thank TRAFFIC staff Richard Thomas, Xu Ling, Roland Melisch and Yannick Kuehl for useful comments on an earlier draft of this paper.

## References

- ADB (Asian Development Bank), 2006. Asian Development Bank and Myanmar, fact sheet. [www.adb.org/Documents/Fact\\_Sheets/MYA.asp](http://www.adb.org/Documents/Fact_Sheets/MYA.asp) (Viewed 09.06.09).
- Anonymous, 2010a. Myanmar and Thailand Authorities Rescue Wildlife from Illegal Trade. <http://www.asean-wen.org/index.php/news-law-enforcement-actions/253-myanmar-and-thailand-authorities-rescue-wildlife-from-illegal-trade>.
- Anonymous, 2010b. 走私穿山甲 11 夫妻双双被判刑. <http://www.chinacourt.org/article/detail/2011/05/id/450227.shtml>.
- Anonymous, 2011a. Pangolin smugglers jailed in China. <http://www.traffic.org/seizures-journal-legacy/2011/5/18/pangolin-smugglers-jailed-in-china.html>.
- Anonymous, 2011b. 穿山甲片藏进药材被识破. [http://ccwb.yunnan.cn/html/2011-05/26/content\\_358046.htm](http://ccwb.yunnan.cn/html/2011-05/26/content_358046.htm).
- Anonymous, 2012a. Pangolin scales worth Rs. 2.3 crore seized. News Track India, 7 September 2012. <http://www.newstrackindia.com/newsdetails/2012/09/07/213-Pangolin-scales-worth-Rs-2-3-crore-seized-.html>.
- Anonymous, 2012b. CDO Thoubal arrest traffickers, recovers huge amount of drugs. Kangla Online 31 August 2012. <http://kanglaonline.com/2012/08/cdo-thoubal-arrest-traffickers-recovers-huge-amount-of-drugs/>.
- Anonymous, 2012c. 63 kg of pangolin scales seized. Business Standard 3 September 2012. [http://www.business-standard.com/article/pti-stories/63-kg-of-pangolin-scales-seized-112090300231\\_1.html](http://www.business-standard.com/article/pti-stories/63-kg-of-pangolin-scales-seized-112090300231_1.html).
- Anonymous, 2012d. Myanmar Strengthens Its Efforts Against Illegal Wildlife Trafficking and Illegal Logging. <http://www.asean-wen.org/index.php/news-law-enforcement-actions/390-myanmar-strengthens-its-efforts-against-illegal-wildlife-trafficking-and-illegal-logging>.
- Anonymous, 2012e. Assam Rifles seizes pangolin shells, drugs. The Times of India 5 May 2012 <http://timesofindia.indiatimes.com/city/guwahati/Assam-Rifles-seizes-pangolin-shells-drugs/articleshow/13012897.cms?referral=PM>.
- Anonymous, 2012f. 87 只穿山甲 也坐了一回飞车. <http://news.hexun.com/2012-09-28/146348940.html>.
- Anonymous, 2013a. Myanmar: Combating Illegal Wildlife Trafficking and Illegal Logging (October–November 2013). <http://www.asean-wen.org/index.php/news-law-enforcement-actions/392-myanmar-combating-illegal-wildlife-trafficking-and-illegal-logging-oct-nov-2013>.
- Anonymous, 2013b. News Round-up, 13–26 July 2013. <http://www.asean-wen.org/index.php/news-in-the-news/389-news-round-up-13-26-july-2013>.
- Anonymous, 2013c. Pangolin scales, pseudoephedrine tablets seized in Guwahati. Business Standard 18 July 2013. [http://www.business-standard.com/article/pti-stories/pangolin-scales-pseudoephedrine-tablets-seized-in-guwahati-113071800685\\_1.html](http://www.business-standard.com/article/pti-stories/pangolin-scales-pseudoephedrine-tablets-seized-in-guwahati-113071800685_1.html).
- Anonymous, 2013d. Kunming customs seized 16 smuggled black bear gall in Kunming. <http://careforchineseanimals.net/2013/07/20/kunming-customs-seized-16-smuggled-black-bear-gall-in-kunming/>.
- Anonymous, 2013e. <http://www.susong51.com/cpws/paperView.htm?id=992d46e0f840f158d587ab6937a18082>.
- Anonymous, 2014a. Myanmar: Combating Illegal Wildlife Trafficking and Illegal Logging (February 2014). <http://www.asean-wen.org/index.php/news-law-enforcement-actions/399-myanmar-combating-illegal-wildlife-trafficking-and-illegal-logging-feb-2014>.
- Anonymous, 2014b. 昆明海关查获今年首起走私珍贵动物制品案. [http://news.ifeng.com/gundong/detail\\_2014\\_02/20/34023223\\_0.shtml](http://news.ifeng.com/gundong/detail_2014_02/20/34023223_0.shtml).
- Anonymous, 2014c. 昆明海关查获走私活体穿山甲. <http://www.customs.gov.cn/publish/portal0/tab65602/info717528.htm>.
- Anonymous, 2014d. 云南德宏查获 421 公斤走私大象皮. [http://www.legaldaily.com.cn/index/content/2014-03/18/content\\_5372986.htm?node=20908](http://www.legaldaily.com.cn/index/content/2014-03/18/content_5372986.htm?node=20908).
- Anonymous, 2015. Thai authorities rescue 150 Pangolins destined for traditional medicine. Wildlife Extra. <http://www.wildlifeextra.com/go/news/pangolins-seized-thailand.html#cr>.
- Baillie, J., Challender, D., Kaspal, P., Khatiwada, A., Mohapatra, R., Nash, H., 2014. *Manis crassicaudata*. IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org) (downloaded on 12 March 2015).
- Baker, F., 2014. Assessing the Asian industry link in the intercontinental trade of African pangolins, Gabon (M.Sc. thesis), University College, London.
- Beyrer, C., 2001. Shan women and girls and the sex industry in Southeast Asia; political causes and human rights implications. Soc. Sci. Med. 53, 543–550.
- Challender, D., Baillie, J., Ades, G., Kaspal, P., Chan, B., Khatiwada, A., Xu, L., Chin, S., Nash, H., Hsieh, H., 2014a. *Manis pentadactyla*. IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org) (downloaded on 12 March 2015).
- Challender, D.W.S., Harrop, S.R., MacMillan, D.C., 2015. Understanding markets to conserve trade-threatened species in CITES. Biol. Cons. 187, 249–259.
- Challender, D.W.S., Hywood, L., 2011. Asian pangolins: Increasing affluence driving hunting pressure. TRAFFIC Bull. 23, 92–93.
- Challender, D.W.S., Hywood, L., 2012. African pangolins under increased pressure from poaching and intercontinental trade. TRAFFIC Bull. 24, 53–55.
- Challender, D., Nguyen Van, T., Shepherd, C.R., 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*. IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org) (downloaded on 12 March 2015).
- Davies, B., 2005. Black Market: Inside the Endangered Species Trade in Asia. Earth Aware Editions, San Rafael.
- Felbab-Brown, V., 2011. The disappearing act—the illicit trade in wildlife in Asia. Brookings Institution, Washington.
- Mohapatra, R.K., Panda, S., Acharyjo, L.N., Nair, M.V., Challender, D.W., 2015. A note on the illegal trade and use of pangolin body parts in India. TRAFFIC Bull. 27, 33–40.
- Naing, W., 2009. Pangolin conservation in Myanmar. In: Pantel, S., Chin, S.Y. (Eds.), 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.
- Nijman, V., 2015. Pangolins trade gauged from seizure data reported in Indonesian media. TRAFFIC Bull. 27, 44–46.
- Nijman, V., Shepherd, C.R., 2014. Emergence of Mong La on the Myanmar–China border as a global hub for the international trade in ivory and elephant parts. Biol. Cons. 179, 17–22.
- Nijman, V., Shepherd, C.R., 2015. Trade in tigers and other wild cats in Mong La and Tachilek, Myanmar—a tale of two border towns. Biol. Cons. 182, 1–7.
- Oswell, A.H., 2010. The Big Cat Trade in Myanmar and Thailand. TRAFFIC Southeast Asia, Petaling Jaya.
- Pantel, S., Chin, S.Y., 2009. Proceedings of a Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia. TRAFFIC South East Asia, Petaling Jaya.
- Peterson, D., 2007. Dark appetites. Asian Geogr. 6, 44–55.

- Sharma, B.K., 2014. Pangolins in trouble. Sanctuary Asia, June 2014. <http://www.sanctuaryasia.com/magazines/features/9749-pangolins-in-trouble.html>.
- Shepherd, C.R., 2009. Overview of pangolin trade in Southeast Asia. In: Pantel, S., Chin, S.Y. (Eds.), *Proceedings of a Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia*. TRAFFIC South East Asia, Petaling Jaya, pp. 6–9.
- Shepherd, C.R., Nijman, V., 2007. An assessment of wildlife trade at Mong La market on the Myanmar–China border. *TRAFFIC Bull.* 21, 85–88.
- Shepherd, C.R., Shepherd, L.A., 2012. *Mammals of Southeast Asia*. John Beaufoy Publishing, London.
- Smith, A.T., Xie, Y., 2008. *A Guide to the Mammals of China*. Princeton University Press, Princeton.
- Zang, Y., 2009. Conservation and trade control of Pangolins in China. In: Pantel, S., Chin, S.Y. (Eds.), *Proceedings of a Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia*. TRAFFIC South East Asia, Petaling Jaya, pp. 66–74.
- Zhou, Z.M., Zhou, Y., Newman, C., Macdonald, D.W., 2014. Scaling up pangolin protection in China. *Front. Ecol. Environ.* 12, 97–98.