

**Wildlife Justice**  
Commission

FEBRUARY 2020

# Scaling up: The Rapid Growth in the Industrial Scale Trafficking of Pangolin Scales

2016-2019





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**16 January 2019**

**8.3 tons of pangolin scales and 2.1 tons of ivory seized in Hong Kong. The scanner image shows the concealment of the contraband under a shipment of frozen beef<sup>1</sup>.**

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# Executive Summary

**Pangolins have become** a highly prized commodity, illegally trapped, killed and trafficked by organised crime networks between Africa and Asia. Analysis of seizure data of smuggled pangolin scales in the last four years shows a significant and rapid increase in the volume being trafficked.

**The findings and conclusions** from the Wildlife Justice Commission (WJC)'s Intelligence Development Unit clearly point to organised crime networks operating on an industrial scale, which is expanding year on year, putting an entire species at risk.

**Between 2016-2019**, an estimated 206.4 tonnes of pangolin scales were intercepted and confiscated from 52 seizures. The WJC believes this is only a fraction of the total being trafficked, as it is likely that a significant proportion of smuggling is not detected.

**Analysis of the seizure data** over the four-year period shows an increase in trafficking at unprecedented levels. Nearly two-thirds of the tonnage seized – 132.1 tonnes – was detected in the last two years (2018-2019). In 2019, the average weight of a single pangolin scale shipment was 6.2 tonnes, compared with 2.2 tonnes three years earlier.

**All eight species of pangolins** have Appendix I designation under the Convention on International Trade

in Endangered Species (CITES) – the highest level of protection, prohibiting any international trade. Despite that and national laws offering them protection in range states in Africa and Asia, populations of Asian pangolins have been so depleted by illegal trade, that African pangolins are now being increasingly targeted by traffickers to supply demand in Asia. Four of the eight pangolin species are found in Africa with three of these species found in Central African forests: the tree-dwelling white-bellied, black-bellied pangolins, and the ground-dwelling giant pangolin. Concerningly, deforestation across west and central African countries has reduced their habitat, making them even more vulnerable to poaching.<sup>2</sup>

**While the scale of trafficking** is vast and still growing, understanding the dynamics of the criminal networks and their operations remains limited.

**Combining analysis** of reported seizure data and the WJC's investigative findings, the WJC Intelligence Development Unit has built a comprehensive understanding of the key countries, smuggling routes, shipping methods, destinations and pricing of pangolin scales. New trends have also been identified which outline the need for this problem to be tackled as a transnational organised crime with the same urgency and methodology used to address other serious crimes.

## Geography of Crime

**Six of the 27 identified** countries and territories disproportionately involved in the trafficking of pangolin scales were found to be linked to 94% (193.2 tonnes) of all seized contraband (206.4 tonnes) during the period analysed in this report. Detection rates (the proportion of seizures detected in-country, compared to shipments that have originated, transited or were destined for certain countries) in these six identified countries varies as follows: China (50%), Democratic Republic of Congo (DRC) (0%), Hong Kong SAR (100%), Nigeria (16.7%), Singapore (33.3%) and Vietnam (40%).

**Nigeria and Vietnam** play prominent roles in the supply chain. Between 2016 – 2019, they were linked to almost 70% of pangolin scale seizures, which amounted to 143.6 tonnes. Furthermore, during 2018-2019 this prevalence increased; as 84% of all detected shipments involved one or both countries. The Nigeria - (Singapore) - Vietnam smuggling route has also been identified as a significant transportation route for the smuggling of scales on their own or in combination with ivory.

**A direct trafficking route** between Nigeria to Vietnam is relatively new, having only been documented since May 2018. Its emergence possibly reflects the

strengthening relationship between traffickers operating in these countries or an emergence of new trafficking networks in Nigeria.

**African countries now represent** the majority of locations of origin for seized scales trafficked to Asia. Analysis has identified Nigeria, DRC and Cameroon as being the biggest players, however, intelligence gaps regarding the sourcing and harvesting of scales still exist.

**Nigeria appears to be one** of the biggest consumers of pangolin meat, especially among the wealthy middle class<sup>3</sup> and within the large Chinese community in Nigeria<sup>4</sup>. It is also the country most heavily implicated in the supply chain of pangolin scales, especially in the years 2018-2019.

**It is suggested that the bodies** of the poached pangolins may be fueling the bushmeat market in Africa as no bodies or skins were recovered amongst the seized scales discussed in this report.

**Nigeria has become a global** export hub, linked to 55% (n=113.1 tonnes) of scales seized between 2016 and 2019. The rise of Nigeria as a prominent actor in the supply chain of the trafficking of pangolin scales may be made possible because of weak law enforcement interventions at ports, compounded by the assistance of corrupt officials that facilitate shipments to



pass undetected. Corruption and wildlife crime are inextricably linked. In 2018, Nigeria scored 27/100 (with 0 being the most corrupt) by the Corruption Perception Index, highlighting its prevalence<sup>5</sup>.



*Image 1 - 20 July 2018, 7.1 tonnes of pangolin scales seized from a container at Tsing Yi Cargo Examination Compound, Hong Kong SAR originating from Nigeria<sup>6</sup>.*

## The Presence of Organised Crime

**The number**, size and location of detected shipments gives some insight into the scale of pangolin trafficking and the reach of the criminal networks behind it. However, additional intelligence and evidence gathered by WJC investigators leave no doubt that significant quantities of pangolin scales are being successfully smuggled into the market, undetected.

**To illustrate**, in Vietnam during the past three years (2017-2019), the WJC has been made aware of the

wholesale stockpiling of more than 16 tonnes of pangolin scales which have been offered for sale to WJC investigators. In one case, in September 2018, the WJC provided evidence to the Vietnamese Environmental Police that led to the seizure of 780 kg of pangolin scales - the largest batch ever seized by authorities in Vietnam outside a port - and the arrest of a significant broker.

**WJC investigators** have also gathered information from brokers who have access to stockpiles in Vietnam but who have been unable to smuggle them over the border into China, due to a fear of detection. In December 2019, one major trafficker reported to the WJC that transportation is problematic and only a small proportion of scales have been successfully smuggled into China from Vietnam by his network.

**Organised crime** is not species specific and criminal networks will shift to other commodities if more profit can be made. To illustrate, investigations by the WJC indicate that criminals previously involved in the ivory trade are now also intricately involved in the trafficking of pangolin scales. The smuggling of ivory combined with pangolin scales is rapidly increasing, doubling in number and tripling in volume between 2017 and 2018. Increasingly, combined shipments have a greater proportion of pangolin scales than ivory, which suggests that there has been a change in commodity type by the criminal networks.

**Price data collected** through WJC investigations over the past three years has yielded additional in-



sight into this trade related to the street value of pangolin scales and demonstrates the variation in prices. Almost all prices obtained relate to the wholesale value of products. Collected price data indicates that the value for scales in Africa are, as expected, much lower than in Asia. During 2018, the price per kilogram (kg) in Nigeria was USD 52. While, in Asia the prices were much higher and sold for USD 226 in Indonesia and USD 283 in Vietnam. The highest retail price was recorded in Lao PDR where it reached USD 739 per kg. No price data for 2019 is available for Africa but in 2019 the retail price in Asia increased and sold for USD 350 in Malaysia, USD 355 in China, and USD 149 per kg in Vietnam. More data is needed to understand pricing trends in relation to the street value of pangolin scales.

## Smuggling Dynamics

**Trafficking by sea**, remains the preferred method for moving large quantities of pangolin scales, accounting for 53.8% (n= 28 of 52) of the seizures throughout the reviewed period. Seizures of pangolin scales at international seaports are increasing, but it is also likely that a significant proportion of smuggling by sea still passes undetected<sup>7</sup>.

Trafficking by air has seen a sharp decrease during 2018-2019. This may be because air cargo cannot accommodate such vast quantities, but also presents a higher risk of detection due to more rigorous air-freight procedural checks.

*Image 2 - 1 July 2017, 11.9 tonnes of pangolin scales discovered in a container at Yantian port, China<sup>8</sup>.*



## Markets and Values

**In China**, even though the poaching, selling and trade in pangolins are illegal<sup>9</sup>, pharmaceutical companies are permitted to produce traditional medicine that contain pangolin parts which are sold to certain hospitals, as part of Traditional Chinese Medicine (TCM)<sup>10</sup>.

**Several large pharmaceutical companies** are using pangolin products in medicine, it was that in 2016, there were purportedly 209 pharmaceutical companies that were licensed to produce 66 types of medication that contained pangolin scales as well as 700 hospitals licensed to sell them<sup>11</sup>.

**One popular Chinese retail website** selling unprocessed pangolin scales disguised the true content

of the products by labelling them as 'resin' or 'emulation'<sup>12</sup>. TCM websites openly advertise pangolin scales as well as meat or live pangolins for captive/breeding purposes<sup>13</sup>.

**It is clear** that traders illegally selling pangolin parts can easily conceal their activities on unlicensed websites, and effectively launder the products through legitimate platforms such as licensed TCM websites. Exceptions also extend beyond China's borders, with medicine markets in Vietnam, Thailand, Lao PDR and Myanmar, legally selling TCM remedies containing pangolin scales<sup>14</sup>.

**It is unclear** from where pharmaceutical producers source the "legal" pangolin scales for their products. The international ban on importing pangolin scales which has existed since 2017, coupled with the high demand within China<sup>15</sup> and the lack of captive

breeding facilities for pangolins, suggests that producers are using illegally imported wild pangolin scales as their main supply.

**Although the scale** of pangolin trafficking is far greater than reported data suggests, there have been some notable breakthroughs during the past 12 months.

**A potential change in market** demand may be realised, following the announcement in China that from January 2020, its national insurance will no longer cover medicines containing pangolin products.

**This policy change** does not only affect pangolins but also a number of other species, which may create a shift away from traditional cultural beliefs toward an acceptance that there is no medicinal value in products derived from animal parts<sup>17</sup>.

**Although the volume of scales** being trafficked is increasing, so too are detection rates. The WJC investigators believe greater use of controlled delivery operations, where shipments are tracked through the entire supply chain, will yield much needed intelligence on the operations of the criminal networks and also act as a deterrent in some cases. A year-long investigation and arrest of 18 suspects in China reported in December 2019<sup>18</sup> to address trafficking across an entire network is a highly successful example of how such approaches could and should work.



*Image 3 - 10 December 2016, 3.1 tons of pangolin scales discovered in timber shipment in Shanghai, China<sup>16</sup>.*



The trafficking of pangolin scales continues on an industrial scale. The coordination and infrastructure required to facilitate the harvesting, production, storage and transportation of this volume of pangolin scales is vast. A coordinated transnational approach to investigations, intelligence gathering and the use of law enforcement tools applied to other major crimes, such as controlled deliveries, are required to tackle it and bring high-level perpetrators to justice.

**This report aims to bridge some of the intelligence gaps in the understanding of the architecture of pangolin trafficking, by identifying key trends and dynamics. However, more intelligence is needed to fully map the networks behind the criminal activity and to identify opportunities to meaningfully disrupt and dismantle the trafficking networks.**



## Background

**Commonly referred** to as the most trafficked mammal in the world<sup>19</sup>, there are eight separate species of pangolin. All are found in either Asia or Africa and all are at risk of extinction as a result of habitat loss and illegal trade. Even though international trade in all eight species is effectively banned under The Convention on International Trade in Endangered Species (CITES) Appendix I, significant smuggling operations continue.

**Pangolin scales** and parts are sought after in Africa and Asia, most especially in China and Vietnam. They are displayed and consumed as symbols of status and wealth, as well as for dubious medical applications and spiritual practices.

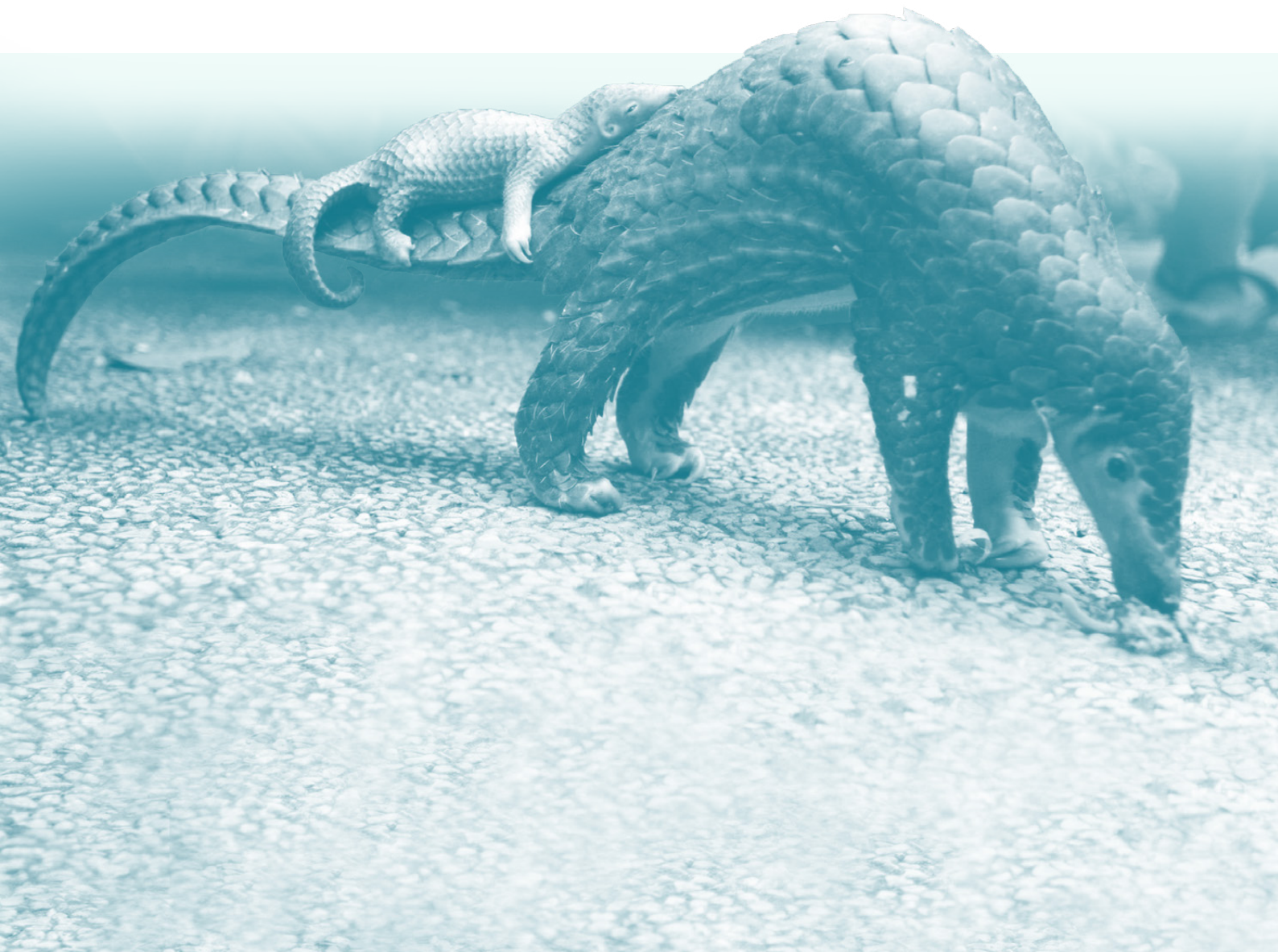


Image 4 - 3 April 2019, Samples of the 12.9-tonnes pangolin scales shipment seized in Singapore in route to Vietnam, indicating the composition of the shipments containing different species of pangolins<sup>20</sup>.



**In some cultures**, it is believed that pangolins possess healing powers and for this reason, the scales are regularly used as an ingredient in traditional medicine or carved for decoration and jewelry. The meat is served as a delicacy; pangolin parts or infant pangolin carcasses are bottled with rice wine to make a popular drink that is regarded as a status symbol consumed by the wealthy upper class<sup>21</sup>.

**Pangolin-derived curatives** are claimed to treat a range of conditions and the high demand for pangolin scales within traditional medicine, mostly in Southeast Asian countries, is leading to their extinction<sup>22</sup>.



# Current Use of Pangolin Scales

## Africa

Across Africa pangolin scales from all four of the endemic species are used in traditional medicine; as part of spiritual and superstitious practices; for bushmeat and overseas export.

### Traditional Medicines and Spiritual Use

**Research suggests** that there is a higher usage for spiritual purposes than for traditional medicine, including protection from witchcraft; as amulets for fending off bad luck; as protectors from evil forces; for financial rituals; and to ward off or summon rain<sup>23</sup>. Pangolin fat is believed to protect individuals against bad luck and evil, while the noses are used to protect homesteads.

**Pangolin parts** including the scales, bones, head, thorax or even the whole animal, are widely used by traditional African healers to “treat” many different health conditions like stomach disorders, gonorrhea, stroke, rheumatism, cuts and wounds as well as high blood pressure<sup>24</sup>.

### Food

**Pangolin meat** is considered a delicacy in many African countries. It is sold in local markets and restaurants in Nigeria, Botswana, Ghana, Sierra Leone, Zimbabwe and Mozambique<sup>25</sup>, with Nigeria’s wealthy middle class and Chinese communities the largest market. Traditionally, only the meat was consumed in regular households and the scales were discarded but, since communities became aware of the lucrative market, scales are instead being retained and sold (Images 5 to 7).



Image 5 - Pangolin soup in Africa (unknown location) – on/ before 17 Feb 2018<sup>26</sup>.



*Image 6 - Pangolin meat in stew, Ayos, Cameroon 24/07/2015<sup>27</sup>.*



*Image 7 - Skinned pangolins being grilled in Africa (unknown location) – on/before 29 Jul 2014<sup>28</sup>.*

## Legality & Protection

The legal status of the pangolin varies across Africa. Some countries have declared them a protected species, as hunting, capturing, killing or trading them domestically is illegal. In others, capturing is permitted for scientific purposes or with a special permit. Where protective legislation is in place, it is not always enforced effectively and, given the current scale of commercial trafficking of pangolins and parts out of Africa, the deterrents are insufficient to curb what has become an international trade.





## Asia

**Populations of all four of the Asian pangolin species have crashed over the last decade, driven by a global wildlife black market which has been feeding the increasing appetite of the booming Chinese middle and upper class for jewelry, artwork, traditional medicine and exotic food. With local supplies running out, the wildlife traffickers are now supplying the demand with African pangolin species<sup>29</sup>.**

### Traditional Medicines and Spiritual Use

**The use of pangolin parts** for religious practices in Asia appears to be historic and there is no informa-

tion to suggest scales are used for spiritual purposes. Within Traditional Chinese Medicine (TCM), pangolin scales are purported to cure various conditions including hangovers, liver conditions, lactation intolerances and arthritis<sup>30</sup>. Scales are commonly dried and processed into powder or pills<sup>31</sup>. As a powder, scales may be inhaled, mixed with other medicines or turned into a paste which allegedly cures skin diseases, detoxification, palsy relief or some types of cancer<sup>32</sup>. Various non-scientific sources state that scales can be taken orally or mixed with herbs to treat an absence of menstruation, joint pains, breast milk stoppage and tuberculosis<sup>33</sup>.

**Pangolin scales** are also used as an ingredient for incense sticks made in Bhutan and Tibet, with online sales and websites promoting their use<sup>34</sup> to help relieve stress, depression and improve energy. Pangolin parts and blood or infant pangolin carcasses with rice wine are consumed with the belief that it will improve skin diseases and breathing problems<sup>35</sup>.

**Remedies containing pangolin scales** can be found at medicinal markets throughout Asia including China, Vietnam, Thailand, Lao PDR, and Myanmar<sup>36</sup>. While curatives identified in 2009 had changed little in presentational style by 2016, it was noted that some were now also alluding to fertility benefits and claims to be “armadillo pills” (Images 8 and 9).



Image 8 – Medicines containing pangolin scales in Asia (possibly China) before Oct 2009<sup>37</sup>.



Image 9 – Medicines containing pangolin scales (Indonesia) before September 2016<sup>38</sup>.

## Food

**Pangolin meat and products** are considered a luxury throughout Asia - especially in China and Vietnam. In Hanoi, restaurant managers claim that dishes containing pangolin parts are the highlight of the menu especially among high-ranking officials. It is also the most expensive meat on offer and is often consumed in order to demonstrate socioeconomic status<sup>39</sup>.

**In both Vietnamese and Chinese** restaurants, it is claimed that the pangolins are cut in front of the customers, potentially to demonstrate the freshness of the products, but it is not only the mature animal meat that is eaten. In Hanoi and Hai Phong, pangolin parts were included in blood soup, fried gut, pangolin soups or stews. Documentation from Liuzhou city in Guanxi province, China, and Lao PDR also showed dishes containing pangolin meat and bones<sup>40</sup> (Images 10-12).

**Bones are cooked** with herbs or turned into pudding. Pangolin fetuses are consumed in soups – as they are believed to boost fertility<sup>41</sup> (Images 13-14).

**The scales do not appear** to be as popular as the meat, although it is understood that they can be served roasted with sand in a hot pan and deep fried<sup>42</sup>.



*Image 10 – Social media post by the “Pangolin Princess” after sharing images of stews she consumed made with the meat of several protected animals, including pangolin<sup>43</sup>.*



*Image 11 – Rice wine with a small pangolin immersed, Hanoi, Vietnam<sup>44</sup>.*





Image 12 – Pangolin listed in a restaurant menu, Vietnam<sup>45</sup>.



Image 13 – Pangolin blood drained in container in Asia<sup>46</sup>.



Image 14 – Pangolin fetuses in Asia<sup>47</sup>.



Image 15 – Pangolin fetus cooked in soup in Asia<sup>47</sup>.



## Further uses

**Pangolin scales** are also used for decorative purposes. Multiple sources stated that scales are used as fashion accessories and jewelry<sup>48</sup>. A WJC field mission also found carved pangolin scales being sold as jewelry (Image 16).

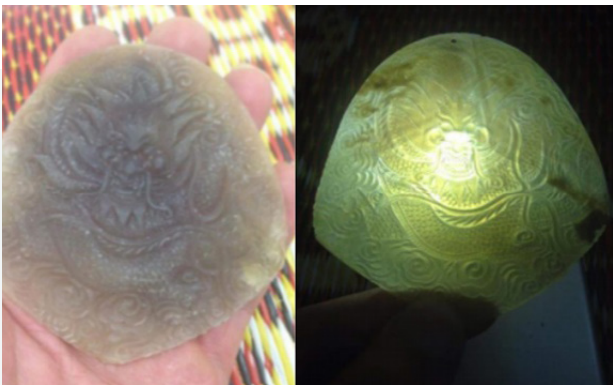


Image 16 – Carved pangolin scale in Vietnam taken from WJC investigations files.

## Traditional Chinese Medicine

**International trade** in all eight species of pangolins (African and Asian) has been banned since 2017<sup>49</sup>. However, some trading is legally permitted in Asia.

**In China**, even though the poaching, selling and trade in unprocessed pangolins is illegal<sup>50</sup>, pharmaceutical companies are allowed to produce traditional medicine containing pangolin parts for sale to certain hospitals, as a TCM<sup>51</sup>. Several large pharmaceutical companies are using pangolin products in medicine, including *Kangmei Pharmaceutical*, *Tong Ren Tang* and *China Traditional Medicine Holdings*<sup>52</sup>. In 2016, there were reported to be 209 pharmaceutical companies licensed to produce 66 types of medication that contained pangolin scales, as well as 700 hospitals who are licensed to sell them<sup>53</sup>.

**Information provided** by The Pangolin Reports indicates a licensed TCM company of medium size requires a yearly supply of several tonnes of scales per year to produce medicines with this ingredient<sup>54</sup>. Using this estimation, it is suggested that these 209 licenced pharmaceutical companies would require over 400 tonnes of scales to operate. If only 10% of these licensed manufacturers were actively producing medicines containing pangolin scales, the legal supply could not match demand. This strongly supports the possibility of the illegal stocks being integrated into the legal market through TCM.

**Through the TCM** exemptions in China, products containing pangolin scales are also legally sold in Vietnam, Thailand, Lao PDR and Myanmar at medicine markets<sup>55</sup>. The TCM system enables online sellers to legally trade in pangolin products in China and other parts of Asia, but it is apparent that the system is being abused. While it is unclear how scales are being smuggled from Vietnam to China, it is suggested that the scales smuggled into China are then processed into TCM products and distributed to other markets in the region, effectively laundering the supplies and enabling wildlife traffickers to continue to abuse the system.

**While the production** and sale of medicines containing pangolin products are legal in China, the trading or poaching of pangolins is not<sup>56</sup>. It is unclear how pharmaceutical companies continue to acquire the amount of pangolin scales used in medicinal products. It is possible that the source of pan-

golin scales used to make TCM are the stockpiles of scales that were imported to China before 2016 even though there is no data available to support this<sup>57</sup> but it is unlikely that the stockpiles were sufficient to have met the current consumption levels. Moreover, it is also unlikely that captive bred pangolins are the providing a source of scales as breeding efforts have not been successful<sup>58</sup>.

**The high demand** for pangolin scales and the numerous scale seizures destined for China<sup>59</sup>, suggests that the main source of scales used by medicine producers are illegal imports from Africa.

**However**, in August 2019, China announced that from January 2020 its national insurance will no longer cover medicine containing pangolin products<sup>60</sup>. This intervention will directly impact upon a user's ability to claim insurance, while it is too soon to measure the effectiveness of this policy change.



*Image 17 - 23 May 2019, 5.26 tonnes of pangolin scales discovered in a container at Cai Mep port, Vietnam. The origin of the shipment was Nigeria<sup>61</sup>.*



**A further possibility** is that smuggled pangolin scales are mixed with previously acquired legitimate stock. In 2015 and 2016, thus before the ban on international trading, *Luoding Chengshan Trade Co. Ltd* legally imported 500 kg from DRC and 1000 kg from Uganda<sup>62</sup>.

**It is suggested** that pharmaceutical companies may have, in the past, mixed legally imported scales from Africa, with illegally sourced stock in order to maintain supply and even relying entirely on trafficked pangolins and parts.

**DNA forensics can identify** the geographic origin of the seized pangolin parts, including scales<sup>63</sup>, however, it cannot distinguish between whether scales have been legally imported and those that have not. The labelling and description of products can provide clues to the legality of the content. Medicine that illegally contain pangolin parts will not specify ingredients such as 'pangolin scales' but instead refer to 'animal-based medicinal treatment'<sup>64</sup>. Legal pangolin scale products are required to be packaged with an official logo of a deer head<sup>65</sup> to indicate a product in compliance with Chinese Wildlife Protection laws<sup>66</sup> (Image 18).



Image 18 – Official logo on complying Chinese medicine products<sup>67</sup>.



Image 19 – Legally sold package without deer head, containing pangolin scales of 10 gr, valued at CNY 180 (USD 27) sold by Tong Ren Tang branch<sup>68</sup>.





# Data & Analysis

**To highlight** the alarming volume of pangolin products being trafficked from Africa to Asia, this analysis will focus only on the global trafficking of pangolin scales as it presents the greatest current threat to the survival of the species.

**CITES states** that evidence of organised crime in wildlife trafficking is indicated when illegal shipments are larger than 500 kg<sup>69</sup>. In order to maintain the same measure of criminality, the seizures examined for this report were all greater than 500 kg. Data from 52 reported pangolin scale seizures taken from open source media reported between January 2016 and December 2019 were analysed to form the basis of this report.

## Results

**The smuggling** of pangolin scales between 2016 and 2019 has reached alarming levels, with significant increases in the number of specimens being seized annually and include record-breaking seizures in 2019.

**While the number** of reported seizures over 500 kg decreased in 2019 compared to 2018, the average size of the shipments increased by 138% over the previous year, from 2.6 tonnes in 2018 to 6.2 tonnes in 2019 (Table 1).

|                          | 2016 | 2017 | 2018 | 2019 | Total |
|--------------------------|------|------|------|------|-------|
| Seizure records          | 11   | 9    | 19   | 13   | 52    |
| Total weight             | 25.1 | 49.1 | 51.1 | 81.1 | 206.4 |
| Mean weight per shipment | 2.2  | 5.4  | 2.6  | 6.2  |       |

Table 1 – Pangolin seizure records by total and mean weight in tonnes (2016-2019).



Image 20 - 8 April 2019, 12.7 tonnes of pangolin scales declared as cas-sia seeds and smuggled from Nigeria to Vietnam via Singapore, where they were discovered<sup>70</sup>.



**The volume** of smuggled pangolin scales that has been documented leads to the question of how many animals this criminality equates to. However, due to the number of species that this trafficking comprises it is impossible to give an accurate assessment of its impact upon conservation efforts.

**After scales** have been removed from an animal and processed a mix of different pangolin species is then packed together into containers before being shipped. This renders converting shipments weights into estimated number of specific species problematic. Using the parameters adapted by Challenger (2015) and Tiki Hywood Trust (2013)<sup>71</sup>, the large variance inherent in trying to make the calculation can be illustrated.

**Basing the calculation** on the fact that the majority of the seizures originated from Central African countries, two calculations were made, comprising of the two most common species in Central and Western Africa namely *Phataginus*

*Tricuspis* and *Smutsia Gigantea*. Their respective scale weights were measured against the total tonnage of scales seized. (Table 2).

| Species   | Scales per specimen (kg) | Number of animals |
|---|--------------------------|-------------------|
| <i>Phataginus Tricuspis</i><br>(African forest pangolins) | 0.36                     | 573,119           |
| <i>Smutsia Gigantea</i><br>(Giant Pangolin)               | 3.60                     | 57,311            |

Table 2 – Total number of specimens represented by total weight seized by species (2016-2019).



**There is a substantial variation** in the weight of the two species. Without knowing the respective weights of the different species in each shipment, it is not possible to translate the size of the shipments into a number of animals, therefore estimates of the number of pangolins the illegal trade represents have not been included in this report.

### **Countries/territories linked to pangolin trafficking**

**The seizure data analysis** identified several countries that feature in the trafficking of pangolin scales, either as a source country, a transit hub or final destination in the smuggling route. The method<sup>72</sup> allows for the identification of the amount of contraband flowing through each country, regardless of where the seizure took place, and how this has changed over time.

**Nigeria, Vietnam, China, Singapore and Hong Kong SAR** are linked to the highest volume of contraband seized. Nigeria, Vietnam and Singapore's total weights were significantly higher during 2019. Prior to 2019, Singapore barely featured as an important location in the supply chain. However several high-volume shipments were detected in 2019, including the discovery of two containers, five days apart, containing a combined total of 25.6 tonnes of pangolin scales and a third seizure in July 2019 of 11.9 tonnes of pangolin scales and 8.8 tonnes of ivory.

**The total weight** attributed to Hong Kong SAR remained relatively constant throughout 2016-2019, indicating it continues to play a persistent role in this trafficking (Table 3).

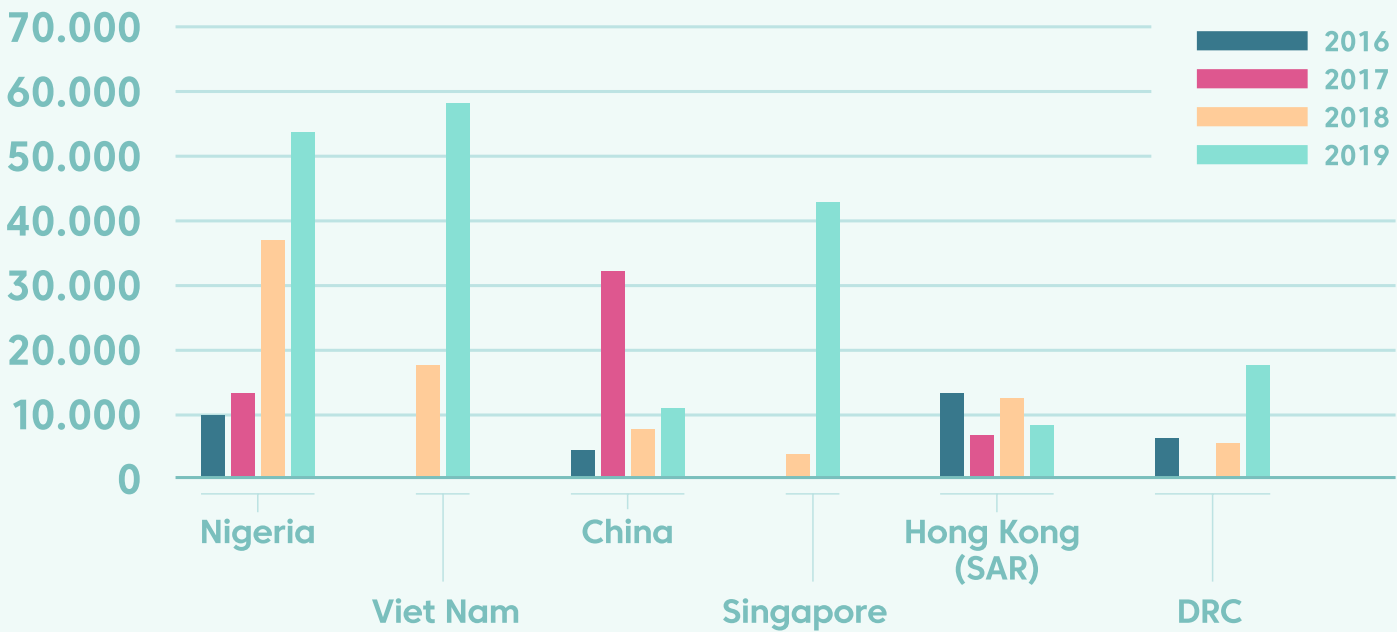
| Country/Territories | 2016      | 2017        | 2018      | 2019      | Total and %         |
|---------------------|-----------|-------------|-----------|-----------|---------------------|
| Nigeria             | 10,400 kg | 13,250 kg   | 36,557 kg | 52,923 kg | 113,130 kg (54.8%)  |
| Vietnam             | -         | -           | 17,411 kg | 57,873 kg | 75,284 kg (36.4%)   |
| China               | 4,700 kg  | 31,858.5 kg | 7,260 kg  | 10,650 kg | 54,468.5 kg (26.4%) |
| Singapore           | -         | -           | 3,800 kg  | 41,513 kg | 45,313 kg (21.9%)   |
| Hong Kong SAR       | 13,400 kg | 7,200 kg    | 12,330 kg | 8,300 kg  | 41,230 kg (20%)     |
| DRC                 | 2,900 kg  | 6,000 kg    | 5,600 kg  | 17,100 kg | 31,600 kg (15.3%)   |
| Cameroon            | 4,670 kg  | 6,450 kg    | 2,518 kg  | 3,100 kg  | 16,738 kg (8.1%)    |
| Malaysia            | 670 kg    | 13,058.5 kg | -         | -         | 13,728.5 kg (6.6%)  |
| South Korea         | -         | -           | -         | 10,650 kg | 10,650 kg (5.1%)    |
| Lao PDR             | 6,300 kg  | -           | -         | -         | 6,300 kg (3%)       |
| Uganda              | -         | 6,000 kg    | -         | -         | 6,000 kg (2.9%)     |
| Tanzania            | -         | 6,000 kg    | -         | -         | 6,000 kg (2.9%)     |
| Thailand            | 5,800 kg  | -           | -         | -         | 5,800 kg (2.8%)     |
| Congo               | 2,900 kg  | -           | 1,800 kg  | -         | 4,700 kg (2.3%)     |
| Turkey              | 2,900 kg  | -           | -         | 1,200 kg  | 4,100 kg (2%)       |
| Cote d'Ivoire       | -         | 3,000 kg    | 600 kg    | -         | 3,600 kg (1.7%)     |
| Cambodia            | -         | -           | 3,300 kg  | -         | 3,300 kg (1.6%)     |
| Burkina Faso        | -         | 3,000 kg    | -         | -         | 3,000 kg (1.4%)     |
| Liberia             | -         | 3,000 kg    | -         | -         | 3,000 kg (1.4%)     |
| Ghana               | 2,100 kg  | -           | -         | -         | 2,100 kg (1%)       |
| Romania             | -         | -           | -         | 1,200 kg  | 1,200 kg (0.6%)     |
| Angola              | -         | -           | 895 kg    | -         | 895 kg (0.4%)       |
| CAR                 | -         | -           | 718 kg    | -         | 718 kg (0.3%)       |
| Indonesia           | -         | -           | 630 kg    | -         | 630 kg (0.3%)       |
| Benin               | -         | -           | 513 kg    | -         | 513 kg (0.2%)       |
| Kenya               | 500 kg    | -           | -         | -         | 500 kg (0.2%)       |
| Guinea              | 500 kg    | -           | -         | -         | 500 kg (0.2%)       |

Table 3 – Countries/territories and highest weight linked regardless of the role, per year (2016-2019)



Six of the 27 countries/territories identified in pangolin trafficking were found to be linked to 94% (193.2 tonnes) of all seized contraband, illustrating the Pareto principle which states that 80% of the effects comes from 20% of the causes. The six identified countries/territories are Nigeria, Vietnam, China, Singapore, Hong Kong SAR and DRC (Chart 1).

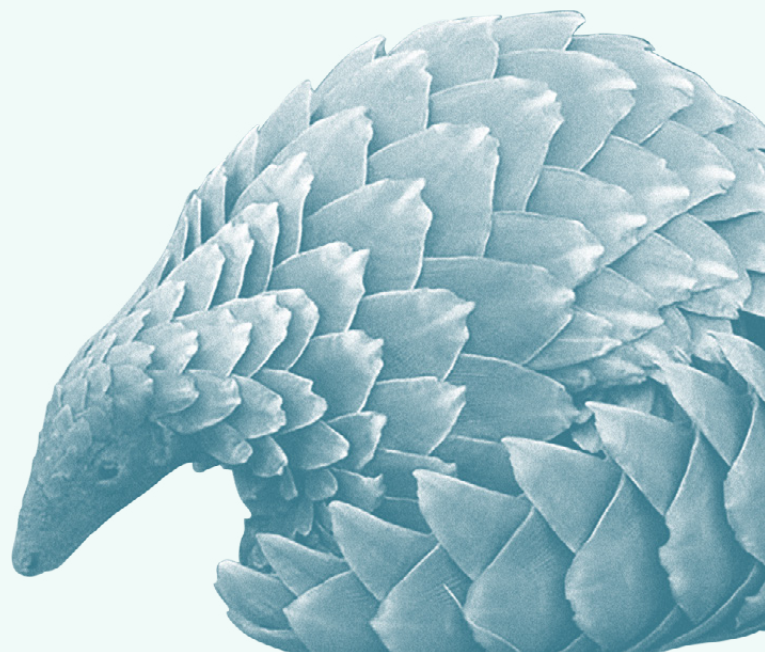
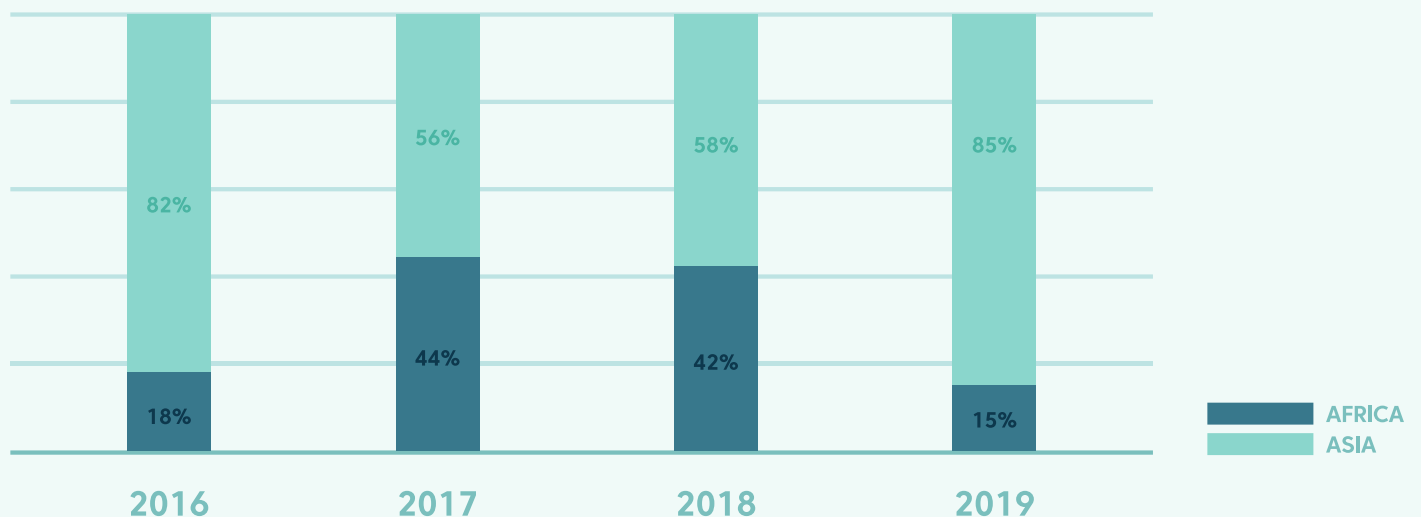
Chart 1 – Top six countries/territories and linked contraband weight (kg) (2016-2019).



## Detection rates

**In the period analysed** for this report, the majority of reported pangolin scale seizures were made in Asia. From 2016 - 2018 there was a notable increase in seizures in Africa, which may have been due to an increase in shipments from Africa, although the number dropped again during 2019, down to only one detected shipment (Chart 2).

Chart 2 – Proportion of shipments detected within Africa and Asia (2016-2019)





**Where known**, a further breakdown of the data clearly shows the differing roles and seizures in each country (Table 4). This analysis indicates Nigeria was

the most prominent country of origin, linked to a total of 17 shipments. Six out of nine shipments discovered in Hong Kong SAR had originated from Nigeria.

| Country/<br>Territories | Destination | Discovered | Origin | Transit | Total | Detection Rate |
|-------------------------|-------------|------------|--------|---------|-------|----------------|
| Vietnam                 | 14          | 10         | -      | 1       | 25    | 40%            |
| Nigeria                 | 2           | 4          | 17     | 1       | 24    | 16.7%          |
| China                   | 6           | 6          | -      | -       | 12    | 50%            |
| Hong Kong SAR           | -           | 9          | -      | -       | 9     | 100%           |
| Singapore               | -           | 3          | -      | 6       | 9     | 33.3%          |
| DRC                     | -           | -          | 9      | -       | 9     | 0%             |
| Cameroon                | -           | 6          | 1      | 2       | 9     | 66.7%          |
| Thailand                | -           | 4          |        | 4       | 8     | 50%            |
| Lao PDR                 | 5           | -          | -      | -       | 5     | 0%             |
| Turkey                  | -           | 1          | -      | 4       | 5     | 20%            |

Table 4 – Top ten most involved country/territories by role with detection rates<sup>73</sup> (2016-2019).

**Despite being** historically implicated as smuggling routes on numerous occasions, countries still often fail to detect illegal products going through their country. Calculations based on the data indicate Nigeria (16.7%) and Singapore (33.3%) have scored the lowest detection rates of almost all involved countries, while none of the nine shipments originating from DRC were detected.

**In the case of Singapore**, the low rate is most likely due to traffickers taking advantage of the fact that

transshipment hubs do not have the capacity to inspect every container<sup>74</sup>. Corruption may also be a factor in low detection rates, particularly in the case of Nigeria<sup>75</sup>.

**Conversely**, Hong Kong SAR has seized 100% of shipments going through the port. However, successful prosecutions remain low, as only one fifth of pangolin smuggling cases reported there since 2014 resulted in a conviction<sup>76</sup>.

## The supply chain

**Information suggests** that within the Asian market, scales are indicated to be in much higher demand as they are a crucial part of TCM products. As species of Asian pangolins gradually declined traffickers switched to Africa in order to meet the continuous demand<sup>77</sup>. This is despite the increased costs and risks inherent in extending the supply chain, yet demand is sufficiently high that trafficking from Africa to Asia remains profitable. Reported seizures analysed for this report confirm the involvement of Asian nationals in the trafficking of scales from Africa to Asia.

## Origin of shipments

**The majority of seizures** made in Asia were consignments of scales that originated from African countries, with 47% (n=97.3 tonnes) of the total weight seized reported to have originated from Nigeria. The next greatest attributor is DRC, representing 15% (n=31.6 tonnes) of all seized scales (Table 5).

| Country                  | 2016          | 2017          | 2018          | 2019          | Total          |
|--------------------------|---------------|---------------|---------------|---------------|----------------|
| Nigeria                  | 2 (10,400 kg) | 2 (12,200 kg) | 6 (21,805 kg) | 7 (52,923 kg) | 17 (97,328 kg) |
| DRC                      | 3 (2,900 kg)  | 1 (6,000 kg)  | 2 (5,600 kg)  | 3 (17,100 kg) | 8 (31,600 kg)  |
| Uganda                   | -             | 1 (6,000 kg)  | -             | -             | 1 (6,000 kg)   |
| Cameroon                 | 1 (4,670 kg)  | -             | -             | -             | 1 (4,670 kg)   |
| Liberia                  | -             | 1 (3,000 kg)  | -             | -             | 1 (3,000 kg)   |
| Burkina Faso             | -             | 1 (3,000 kg)  | -             | -             | 1 (3,000 kg)   |
| Cote d'Ivoire            | -             | 1 (3,000 kg)  | -             | -             | 1 (3,000 kg)   |
| Congo                    | 1 (2,900 kg)  | -             | -             | -             | 1 (2,900 kg)   |
| Ghana                    | 1 (2,100 kg)  | -             | -             | -             | 1 (2,100 kg)   |
| Central African Republic | -             | -             | 1 (718 kg)    | -             | 1 (718 kg)     |
| Indonesia                | -             | -             | 1 (630 kg)    | -             | 1 (630 kg)     |
| Guinea                   | 1 (500 kg)    | -             | -             | -             | 1 (500 kg)     |

Table 5 – Countries of origin and total attributed weight (2016-2019)

**Nigeria's growing role** as a country of origin is clearly illustrated by the data, which shows the weight of the consignments originating from Nigeria more than doubled in 2019 compared with 2018. It is also noted that only 12.2 tonnes of scales were seized in-country, while all other shipments left Nigeria undetected. The remaining 97.3 tonnes of scales origi-

nating from Nigeria were seized in Asia, with Hong Kong SAR seizing the most scales at 34.5 tonnes. The high contraband volumes and recurrent use of the route between Nigeria and Hong Kong SAR may reflect a strong relationship between traffickers operating in these countries/territories (Table 6).

| Country/<br>Territory | 2016      | 2017      | 2018      | 2019      | Total     |
|-----------------------|-----------|-----------|-----------|-----------|-----------|
| Hong Kong SAR         | 7,300 kg  | 7,200 kg  | 11,700 kg | 8,300 kg  | 34,500 kg |
| Singapore             | -         | -         | -         | 25,613 kg | 25,613 kg |
| China                 | 3,100 kg  | -         | -         | 10,650 kg | 13,750 kg |
| Vietnam               | -         | -         | 10,105 kg | 8,360 kg  | 18,465 kg |
| Malaysia              | -         | 5,000 kg  | -         | -         | 5,000 kg  |
| Total                 | 10,400 kg | 12,200 kg | 21,805 kg | 52,923 kg | 97,328 kg |

Table 6 – Weight of seized contraband originating from Nigeria (2016-2019)

## Transit countries

**Singapore has been identified** as the primary transit country in terms of volume of illegal pangolin shipments. The majority of shipments seized in Singapore originated from Nigeria.

Large volumes of contraband continue to flow through Vietnam and Hong Kong SAR which suggests both countries/territories are being used as transit points for scales en-route to China (Table 7).

| Country     | 2016         | 2017         | 2018         | 2019          | Total         |
|-------------|--------------|--------------|--------------|---------------|---------------|
| Singapore   | -            | -            | 1 (3,800 kg) | 4 (41,513 kg) | 5 (45,313 kg) |
| South Korea | -            | -            | -            | 1 (10,650 kg) | 1 (10,650 kg) |
| Uganda      | -            | 1 (6,000 kg) | -            | -             | 1 (6,000 kg)  |
| Thailand    | 4 (5,800 kg) | -            | -            | -             | 4 (5,800 kg)  |
| Malaysia    | -            | 1 (5,000 kg) | -            | -             | 1 (5,000 kg)  |
| Turkey      | 3 (2,900 kg) | -            | -            | 1 (1,200 kg)  | 4 (4,100 kg)  |
| Vietnam     | -            | -            | 1 (3,300 kg) | -             | 1 (3,300 kg)  |
| Cameroon    | -            | -            | 2 (2,518 kg) | -             | 2 (2,518 kg)  |
| Congo       | -            | -            | 1 (1,800 kg) | -             | 1 (1,800 kg)  |
| Nigeria     | -            | -            | 1 (718 kg)   | -             | 1 (718 kg)    |
| Kenya       | 1 (500 kg)   | -            | -            | -             | 1 (500 kg)    |

Table 7 – Transit countries and total attributed weight (2016-2019)

## Destinations

**In terms of volume**, the main destinations for pangolin scale shipments during the analysis period were China and Vietnam, with China the primary country until 2018, when Vietnam took the lead.

Pangolin scales were most commonly smuggled from either Nigeria or DRC and occasionally transited Singapore to Vietnam. Supplies to China most often came via Malaysia or Nigeria, with one notable exception via South Korea. (Table 8).

| Country  | 2016         | 2017          | 2018          | 2019          | Total          |
|----------|--------------|---------------|---------------|---------------|----------------|
| Vietnam  | -            | -             | 7 (13,331 kg) | 7 (49,873 kg) | 14 (63,204 kg) |
| China    | -            | 3 (18,458 kg) | 2 (14,360 kg) | 1 (10,650 kg) | 6 (43,468 kg)  |
| Lao PDR  | 5 (6,300 kg) | -             | -             | -             | 5 (6,300 kg)   |
| Cambodia | -            | -             | 1 (3,300 kg)  | -             | 1 (3,300 kg)   |
| Nigeria  | -            | 1 (1,050 kg)  | 1 (1,800 kg)  | -             | 2 (2,850 kg)   |
| Romania  | -            | -             | -             | 1 (1,200 kg)  | 1 (1,200 kg)   |
| Malaysia | 1 (670 kg)   | -             | -             | -             | 1 (670 kg)     |

Table 8 – Countries of destination and total attributed weight (2016-2019)



## Persistent smuggling routes

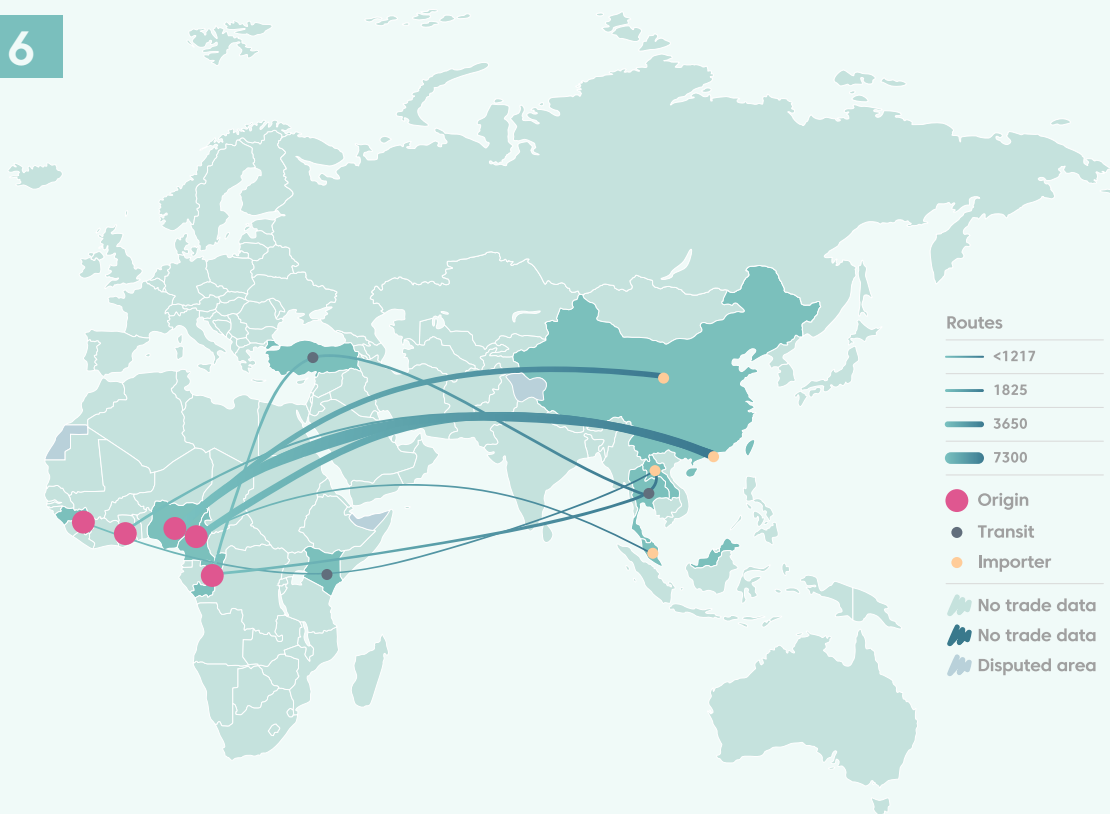
The top three most persistent smuggling routes connect the top six players in pangolin trafficking: Nigeria, Vietnam, China, Singapore, Hong Kong SAR

and DRC. While no meaningful pattern was identified, the routes appear to increasingly revolve around Nigeria and Vietnam or Hong Kong SAR, with Singapore emerging as the transit hub between them. (Table 9 and Map 1).

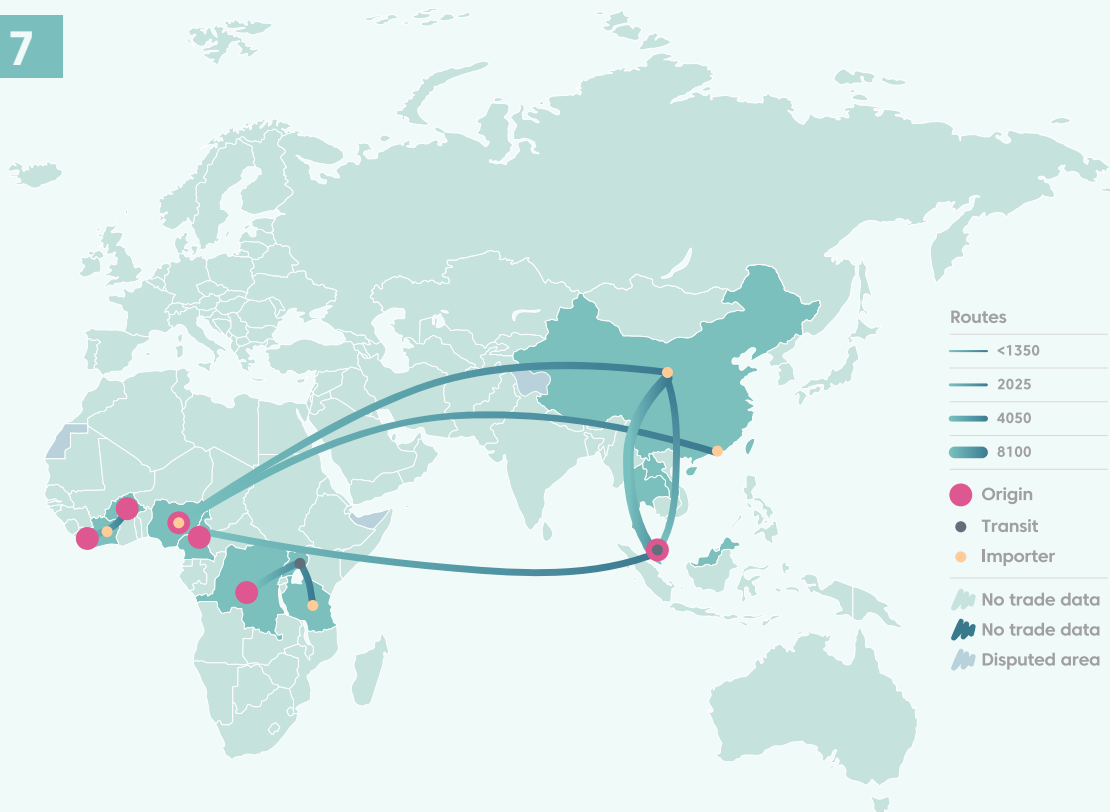
| 2016                                 | 2017                                    | 2018                                  | 2019   |
|--------------------------------------|---|---------------------------------------|--|
| Nigeria – Hong Kong SAR<br>7,300 kg  | Malaysia – China<br>13,058.5 kg         | Nigeria – Hong Kong SAR<br>11,700 kg  | Nigeria – (Singapore) – Vietnam<br>33,973 kg |
| Cameroon – Hong Kong SAR<br>4,000 kg | Nigeria – Hong Kong SAR<br>7,200 kg     | Nigeria – Vietnam<br>10,823 kg        | DRC – Singapore – Vietnam<br>15,900 kg       |
| Nigeria – China<br>3,100 kg          | -Nigeria – Malaysia - China<br>5,000 kg | DRC – Singapore – Vietnam<br>3,800 kg | Nigeria – Hong Kong SAR<br>8,300 kg          |

Table 9 – Smuggling routes linked to highest volume of scales (2016-2019)

2016



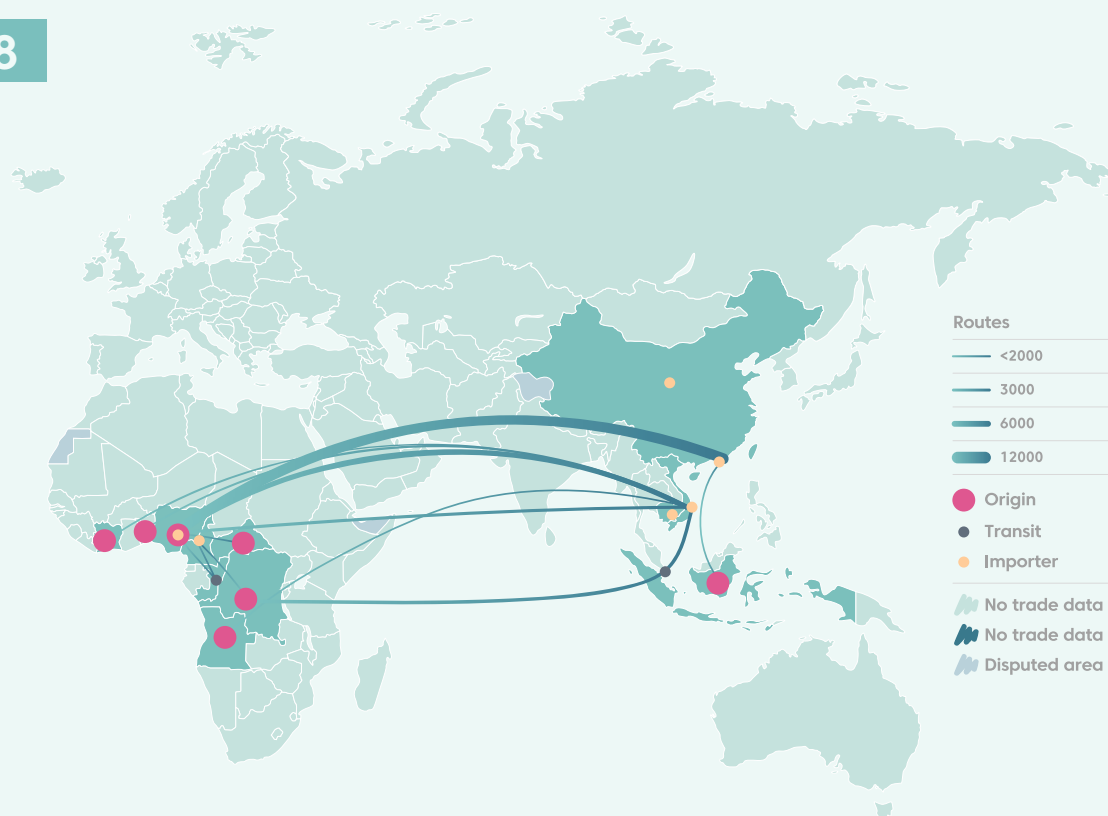
2017



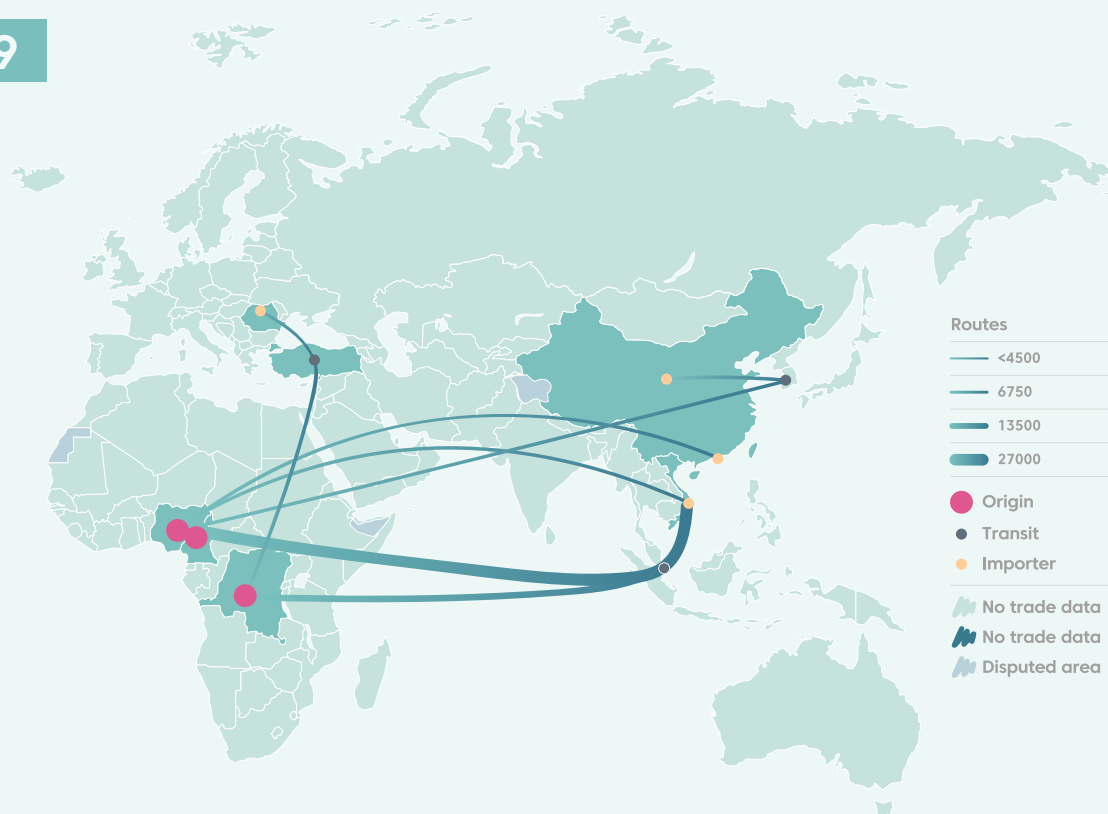
Map 1 – Smuggling routes, per period containing weight (kg), 2016-2017.



2018



2019



Map 1 – Smuggling routes, per period containing weight (kg), 2018-2019.



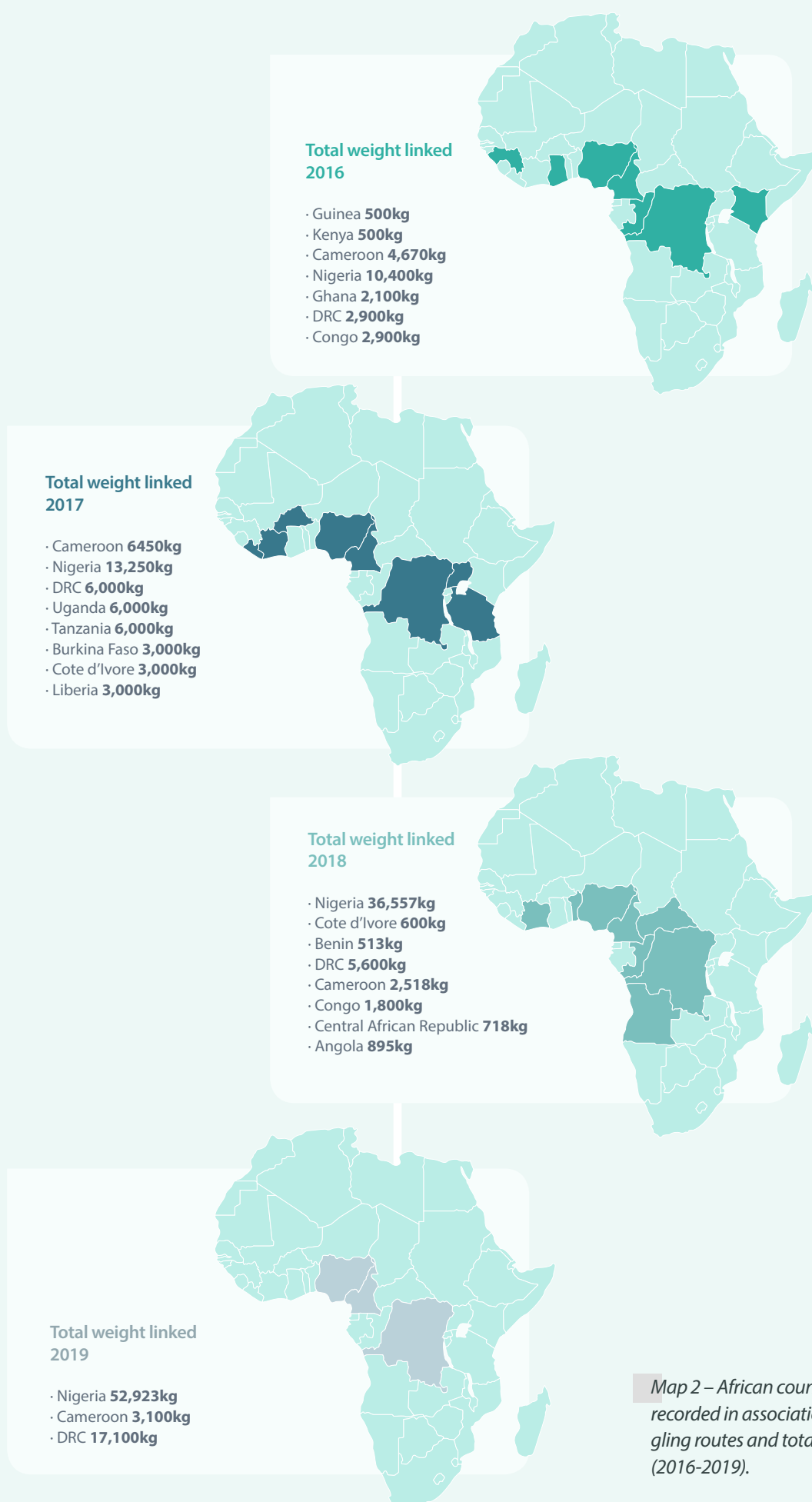
## Displacement

**In Africa**, a shift was observed in the smuggling routes, from eastern to western countries, specifically from Kenya, Tanzania and Uganda to Cote D'Ivoire but most notably to DRC. While both Nigeria and Cameroon were consistently present in smuggling routes throughout the period, Nigeria was linked to the highest volume of scales seized worldwide.

**Additional analysis** of the continental routes used to smuggle smaller volumes of contraband that were not included in this report could provide more insight of Nigeria's role not only as an exit point but as a consolidation point prior to export. (Table 10 and Map 2).

| Country       | 2016      | 2017      | 2018      | 2019      | Total              |
|---------------|-----------|-----------|-----------|-----------|--------------------|
| Nigeria       | 10,400 kg | 13,250 kg | 36,557 kg | 52,923 kg | 113,130 kg (54.8%) |
| DRC           | 2,900 kg  | 6,000 kg  | 5,600 kg  | 17,100 kg | 31,600 kg (15.3%)  |
| Cameroon      | 4,670 kg  | 6,450 kg  | 2,518 kg  | 3,100 kg  | 16,738 kg (8.1%)   |
| Uganda        | -         | 6,000 kg  | -         | -         | 6,000 kg (2.9%)    |
| Tanzania      | -         | 6,000 kg  | -         | -         | 6,000 kg (2.9%)    |
| Congo         | 2,900 kg  | -         | 1,800 kg  | -         | 4,700 kg (2.3%)    |
| Cote d'Ivoire | -         | 3,000 kg  | 600 kg    | -         | 3,600 kg (1.7%)    |
| Burkina Faso  | -         | 3,000 kg  | -         | -         | 3,000 kg (1.4%)    |
| Liberia       | -         | 3,000 kg  | -         | -         | 3,000 kg (1.4%)    |
| Ghana         | 2,100 kg  | -         | -         | -         | 2,100 kg (1%)      |
| Angola        | -         | -         | 895 kg    | -         | 895 kg (0.4%)      |
| CAR           | -         | -         | 718 kg    | -         | 718 kg (0.3%)      |
| Benin         | -         | -         | 513 kg    | -         | 513 kg (0.2%)      |
| Kenya         | 500 kg    | -         | -         | -         | 500 kg (0.2%)      |
| Guinea        | 500 kg    | -         | -         | -         | 500 kg (0.2%)      |

Table 10 - Displacement of activity in Africa: Total attributed weight (2016-2019)



Map 2 – African countries/territories recorded in association with smuggling routes and total weight (2016-2019).

Between 2016 – 2019 the four Asian countries/territories featured most frequently in illegal shipment

routes were consistently Hong Kong SAR, China, Vietnam and Singapore (Map 3).

#### Total weight linked 2016

- China **4,700kg**
- Hong Kong SAR **13,400kg**
- Malaysia **670kg**
- Thailand **5,800kg**
- Turkey **2,900kg**

#### Total weight linked 2017

- China **31,858.5kg**
- Hong Kong SAR **7,200kg**
- Malaysia **13,058.5kg**

#### Total weight linked 2018

- Vietnam **17,411kg**
- China **7,260kg**
- Hong Kong SAR **12,330kg**
- Cambodia **3,300kg**
- Indonesia **630kg**

#### Total weight linked 2019

- Vietnam **57,873kg**
- China **10,650kg**
- Singapore **41,513kg**
- Hong Kong SAR **8,300kg**
- Republic of Korea **10,650kg**
- Turkey **1,200kg**

Map 3 – Asian countries/territories recorded in association with smuggling routes and total weight (2016-2019).

There are several parallels between pangolin trafficking and ivory smuggling over the same time period. For ivory – where Kenya and Tanzania were once prominent trafficking countries – there has

been a pronounced shift to Nigeria in the past two years. This mirrors the pattern of pangolin scale trafficking and points to the likelihood of the same syndicates being involved in both commodities.

# Shipping & Concealment methods

## Transportation

**Maritime routes** remain the preferred method for smuggling large quantities of pangolin scales. Over half of the seizures reported during 2016-2018 were

by sea, with the frequency significantly increasing to 76.9% in 2019. Airfreight seizures have decreased from 2016 onwards and this is likely to be attributed to the huge volumes of scales that are now being smuggled (Table 11).

| Transport Mode | 2016      | 2017      | 2018      | 2019       | Total |
|----------------|-----------|-----------|-----------|------------|-------|
| Sea            | 5 (45.5%) | 5 (55.6%) | 8 (42.1%) | 10 (76.9%) | 28    |
| Air            | 6 (54.5%) |           | 2 (10.5%) | 1 (7.7%)   | 10    |
| Premises       | -         | 1 (11.1%) | 6 (31.6%) | -          | 6     |
| Land vehicle   | -         | 2 (22.2%) | 1 (5.3%)  | 2 (15.4%)  | 5     |
| Unknown        | -         | 1 (11.1%) | 2 (10.5%) | -          | 3     |
| Total          | 11        | 9         | 19        | 13         | 52    |

Table 11 – Mode of transport recorded for pangolin scales shipments (2016-2019)

## Concealment

**A variety of commodities** were used to conceal pangolin scales shipments, with traffickers either mis-declaring them as legal goods or disguising them among legal goods. The most common five

commodities linked to the largest shipments were 1. Plastic waste (scrap intended for recycling), 2. Beans/nuts/seeds, 3. Frozen meat, 4. Timber, 5. Ginger. (Table 12).

| Misdeclared seizures | 2016      | 2017      | 2018      | 2019      | Total     | % of total |
|----------------------|-----------|-----------|-----------|-----------|-----------|------------|
| Plastic scrap        | 13,400 kg | -         | 15,530 kg | -         | 28,930 kg | 31%        |
| Beans/Nuts/Seeds     | -         | 5,000 kg  | 3,300 kg  | 17,960 kg | 26,260 kg | 14%        |
| Frozen meat          | -         | -         | -         | 21,200 kg | 21,200 kg | 12.7%      |
| Timber               | 3,100 kg  | -         | -         | 15,000 kg | 18,100 kg | 10.3%      |
| Ginger               | -         | -         | -         | 10,600 kg | 10,600 kg | 8.8%       |
| Animal shells        | -         | 8,058 kg  | -         | -         | 8,058 kg  | 5.1%       |
| Raw granite          | -         | -         | 7,260 kg  | -         | 7,260 kg  | 4%         |
| Charcoal             | -         | 7,200 kg  | -         | -         | 7,200 kg  | 3.5%       |
| Broken machines      | -         | 5,400     | -         | -         | 5,400 kg  | 3.5%       |
| Tar                  | -         | -         | -         | 4,000 kg  | 4,000 kg  | 2.6%       |
| Metal scraps         | -         | -         | 2,800 kg  | -         | 2,800 kg  | 1.9%       |
| Furniture            | -         | -         | -         | 1,200 kg  | 1,200 kg  | 1.4%       |
| Unknown/Unconcealed  | 8,570 kg  | 23,450 kg | 22,145 kg | 11,100 kg | 65,265 kg | 0.6%       |

Table 12 – Concealment methods used in pangolin scales smuggling and associated weight (2016-2019).





*Image 21 - 24 January 2019, 1.4 tonnes of pangolin scales and 100 kg of ivory concealed in timber were discovered by Vietnamese authorities at Hai Phong Port. The shipment had originated in Nigeria and transited Singapore<sup>78</sup>.*

**There is some consistency** in employed concealment products between 2018 and 2019 with multiple cashew/dried nut shipments being used in Nigeria and logs/timber being used in DRC. Although plastic scrap/waste was a common concealment commodity used in Nigeria in 2018, it was not used in 2019, which may suggest that the syndicate has changed their modus operandi.

**There are several possibilities** for the variety of shipments originating from Nigeria. It could be an indication that multiple syndicates are involved, with assistance from different connections at local consignee companies. Alternatively it could suggest one syndicate has established associations with multiple local companies willing to use their shipping histories and licenses to conceal the illegal product in their legitimate exports. A third possibility is that one syndicate has set up multiple companies (in a variety of fields) for the express purpose of shipping illegal goods. Analysis of available consignor information points to the second option as the most likely.

**The use of plastic waste** for concealment was more commonly associated with smuggling routes between western Africa – Nigeria, Ghana and Cameroon – and Hong Kong SAR as well as Vietnam (Table 13). In 2019, two shipments of scales, with a total weight of 21.2 tonnes, were found among ivory originating from Nigeria. The shipments were misdeclared as frozen beef, with one destined for Hong Kong SAR and the other for Vietnam. Scales concealed in charcoal, beans/nuts and timber were also associated with Nigeria, Cameroon, China, Hong Kong SAR, Vietnam and Singapore.

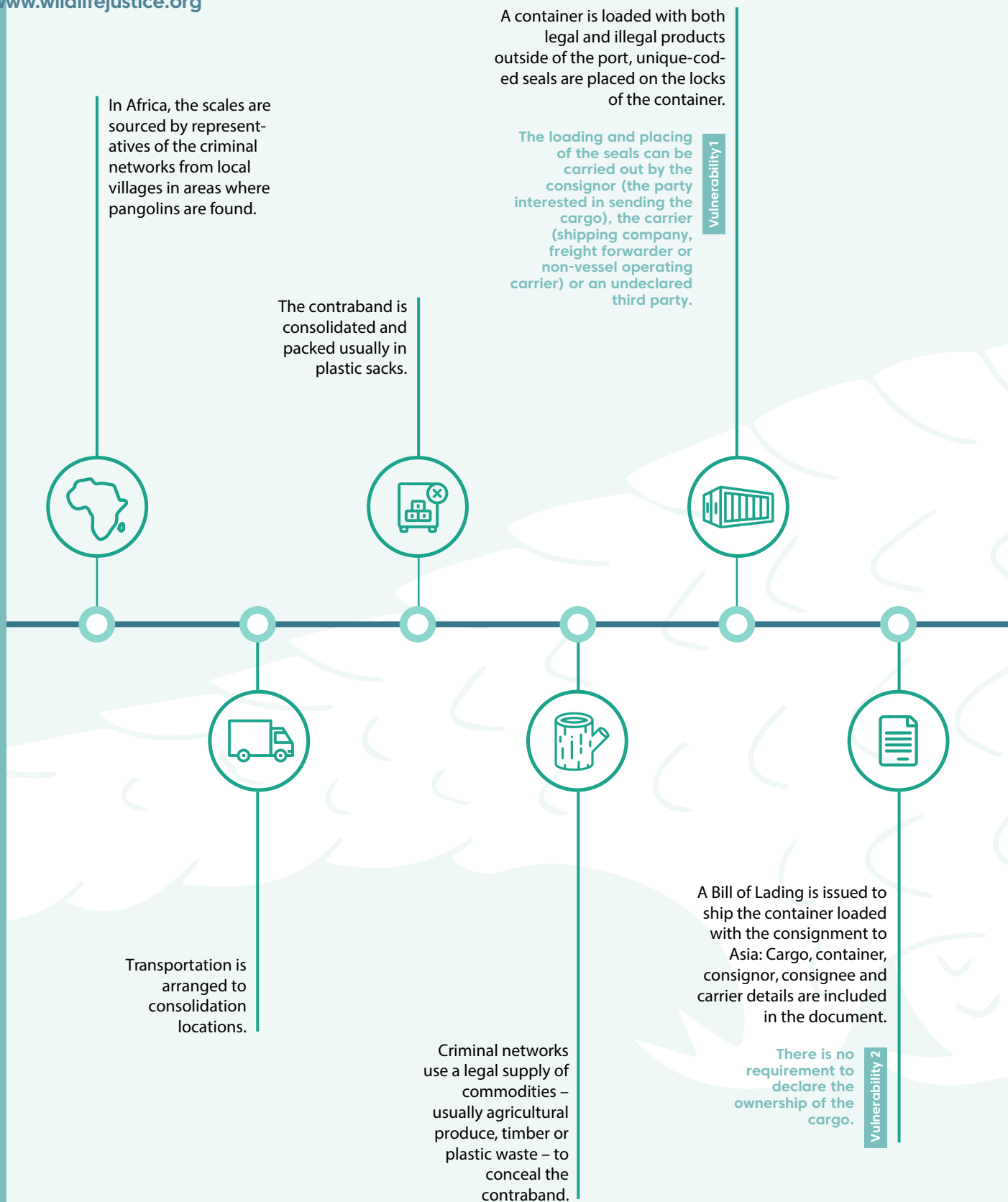
| Concealment               | 2016                     | 2017                       | 2018                         | 2019   |
|---------------------------|--------------------------|----------------------------|------------------------------|--|
| Animal shells (by sea)    | -                        | Malaysia - China           | -                            | -  |
| Charcoal (by sea)         | -                        | Nigeria – Hong Kong SAR    | -                            | -  |
| Frozen meat (by sea)      | -                        | -                          | -                            | Nigeria – Hong Kong SAR<br>Nigeria - Singapore – Vietnam     |
| Metal scrap (by sea)      | -                        | -                          | Nigeria - Hong Kong SAR      | -  |
| Nuts/seeds/beans (by sea) | -                        | Nigeria - Malaysia - China | Nigeria - Vietnam - Cambodia | Nigeria – Vietnam<br>Nigeria – Singapore – Vietnam           |
| Plastic scrap (by sea)    | Cameroon - Hong Kong SAR | -                          | Indonesia - Hong Kong SAR    | -  |
|                           | Ghana - Hong Kong SAR    |                            | Nigeria - Hong Kong SAR (2)  |  |
|                           | Nigeria - Hong Kong SAR  |                            | Nigeria – Vietnam            |  |
| Raw granite (by sea)      | -                        | -                          | China                        | -  |
| Tar (by sea)              | -                        | -                          | -                            | DRC - Singapore - Vietnam                                    |
| Timber (by sea)           | Nigeria - China          | -                          | -                            | Nigeria – (Singapore) - Vietnam<br>DRC – Singapore – Vietnam |
| Broken machines (by sea)  | -                        | Cameroon - China           | -                            | -  |
| Furniture (by air)        | -                        | -                          | -                            | DRC – Turkey - Romania                                       |
| Ginger                    | -                        | -                          | -                            | Nigeria - South Korea - China                                |

Table 13 – Concealment of pangolin scales linked to smuggling routes (2016-2019)



Image 22 - 3 April 2019, 12.9 tonnes of pangolin scales and 177 kg of ivory seized from a shipment of frozen beef in Singapore. The consignment was sent from Nigeria and on route to Vietnam<sup>79</sup>.

# Supply chain of pangolin scales

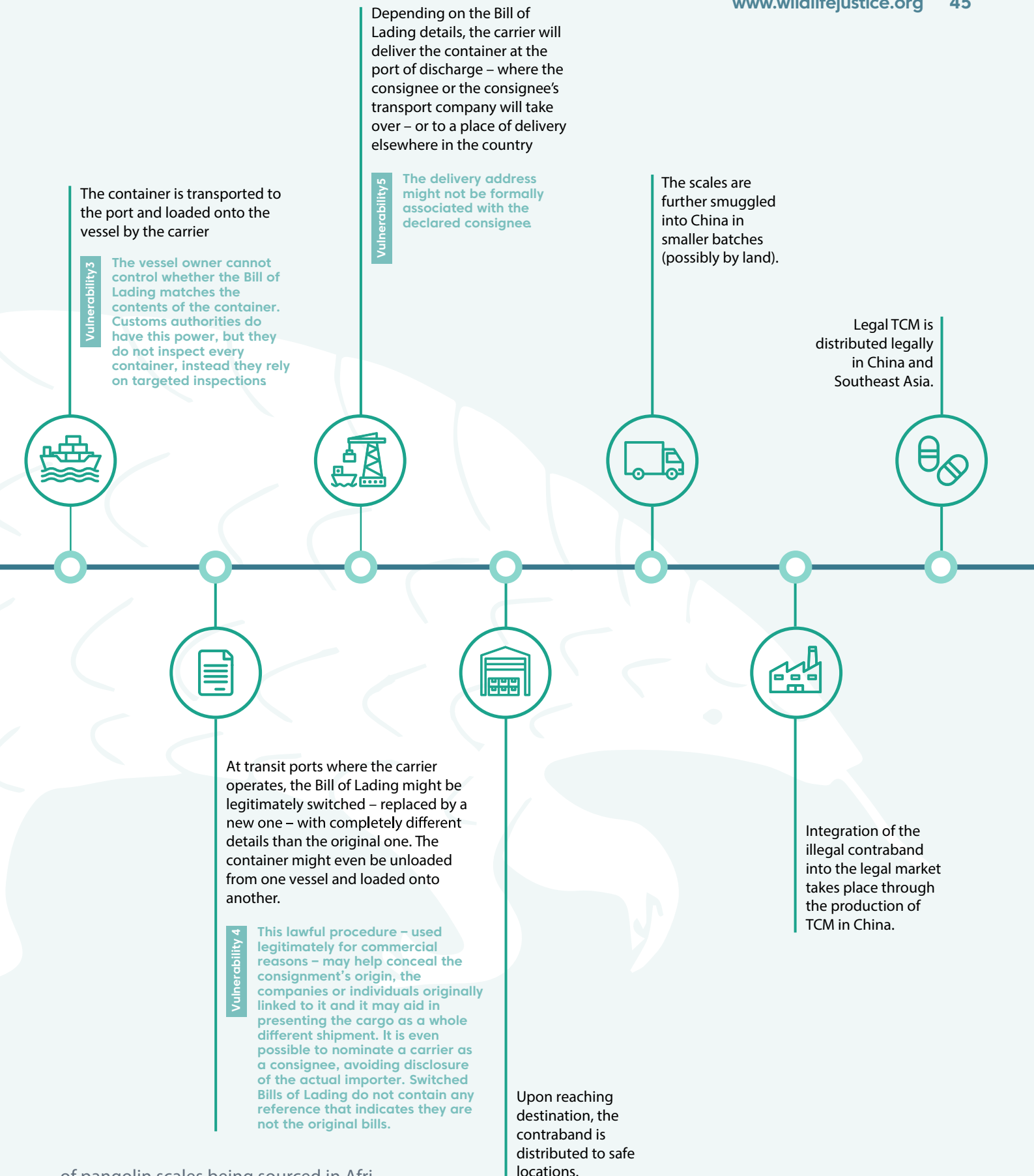


## Supply Chain

**Transnational wildlife trafficking** is a complex process and relies on a criminal network and supply chain which includes corrupt officials and workers at key ports, airports and border crossings.

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The networks also take advantage of intrinsic vulnerabilities in shipping processes, which enable them to hide or disguise the true nature of the shipment. The graphic illustrates the supply chain



of pangolin scales being sourced in Africa, ways in which they can be trafficked, and vulnerabilities exploited across multiple geographical boundaries in order to reach the final consumer.



## Factors affecting an increase in volume of smuggled scales

**It is clear that** trafficking of pangolin scales is increasing in volume, but the reasons for the increase are opaque, perhaps partly because of a lack of detailed understanding of demand in Asia. The harvesting and processing of scales at this level in Africa also remains an important intelligence gap.

**While it appears** that the most generalised use for pangolin scales is within TCM but it is not known if the illegal flow of scales is supplying legitimate TCM manufacturers. Or if, in addition to this, unlicensed TCM producers are supplying illegal trade. Equally, questions remain about whether demand for these products is actually increasing.

**The motivation of the traffickers** to continue smuggling increasing quantities of scales, despite im-

proved detection rates also merits further consideration and analysis. While it is possible that transportation costs are lowest when smuggling larger shipments by sea, the overall losses caused by the seizures do not appear to deter traffickers.

**One additional explanation** for the larger shipments could be the apparent substitution of ivory for pangolin scales in the trafficking of wildlife. WJC has observed that while the price of ivory has been decreasing following implementation of the domestic ivory ban in China in 2017, the price of pangolin scales has been on the rise<sup>80</sup> (Market Dynamics, Page 50). However, since ivory remains a more expensive commodity than scales, greater volumes of scales must be moved to compensate for the loss in the value per kg of ivory.



## Ivory and pangolin scales

An increase in the prevalence of ivory and pangolin scales being smuggled together in combined shipments was observed and reported by WJC in September 2019<sup>81</sup>. To better understand this evolving dynamic, additional analysis was undertaken of combined shipments consisting of 500 kg or more of either or both ivory and pangolin scales<sup>82</sup>.

*Image 23 - 16 January 2019 – 8.3 tonnes of pangolin scales and 2.1 tonnes of ivory seized from a container in Hong Kong SAR. The shipment had arrived from Nigeria and was declared as frozen beef<sup>83</sup>.*



Between 2016 and 2019, the number of detected combined shipments grew year on year. The weight of detected shipments increased even more substantially, from an average of 1.1 tonnes in 2016 to 6.9 tonnes during 2019.

A significant increase in the weight of the pangolin scales being smuggled alongside ivory was noted in 2019 – with a 316% increase in comparison with 2018 (Table 14).

The WJC has observed a sustained decrease in the wholesale price of ivory in Asia in the last four years<sup>84</sup>, which may explain the substitution of ivory for another product with a growing market. This level of substitution is so great in some cases that the amount of ivory included in some of the combined shipments appears to be an accessory, with pangolin scales now being the main contraband (Chart 3).

|      | Seizures | Scales total weight | Ivory total weight (kg) | Total weight (kg) |
|------|----------|---------------------|-------------------------|-------------------|
| 2016 | 2        | 407.6 kg            | 1,956.9 kg              | 2,364.5 kg        |
| 2017 | 3        | 6,846.2 kg          | 12,312 kg               | 19,158.2 kg       |
| 2018 | 6        | 11,304 kg           | 3,669 kg                | 14,973 kg         |
| 2019 | 9        | 43,723 kg           | 18,606 kg               | 62,329 kg         |

Table 14 – Seizures of combined contraband, pangolin scales and ivory (2016-2019)

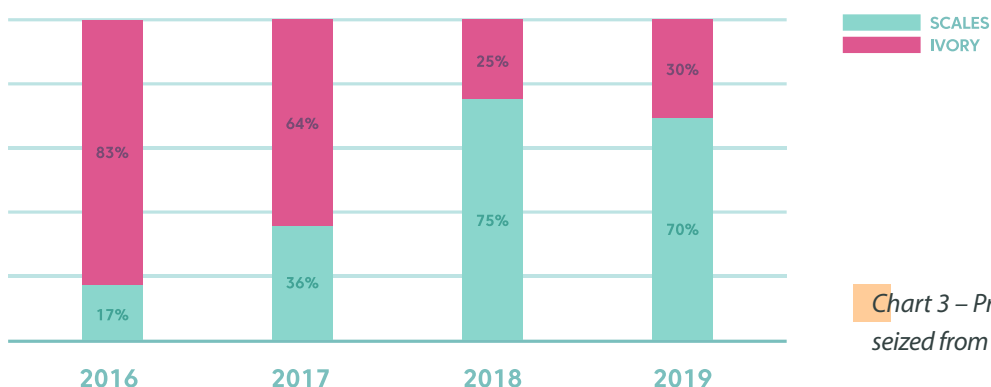


Chart 3 – Proportion of pangolin scales and ivory seized from combined shipments, 2016-2019 (%).

**This is also in keeping** with WJC investigations which have documented a notably decline in traffickers' interest to trade in ivory. Prominent ivory brokers have spoken of their desperation to offload huge stocks of ivory. In spite of this, traffickers continue to take risks even when the return on profit is smaller because the cost of service fees (transportation and fees/taxes for corrupt officials) has remained the same, leading to a situation where more products must be moved in order to maintain profit margins.

**The preferred mode** of transport for combined ivory/pangolin shipments is by sea (n=10 of 20 records), consistent with the method for shipments of pangolin scales. While timber as a commodity concealment method is less frequently used for pangolin scales smuggling, it has been used more frequently to smuggle combined shipments, particularly during 2019 (n=4 of 9). Conversely, the use of plastic scraps, the leading concealment method for pangolin scale, has only been recorded once in the combined shipments analysis.

**The shift in smuggling** pangolin scales from the east to the west coast of Africa is also reflected in the analysis of combined shipments which involves the same countries, with Nigeria, DRC and Cameroon most active.

### Corruption as a common factor

**Corruption is a recurring component** in wildlife trafficking. Four of the west African countries heavily implicated in pangolin trafficking during this period also score similarly on the Corruption Perception Index<sup>85</sup>. The Index rates countries from 0 to 100, where 0 is highly corrupt and 100 is very transparent. Nigeria has been rated as highly corrupt in 2018 and had a total average score of 27 out of 100, slightly more favourable than Central African Republic and Cameroon. DRC ranked most corrupt of all four. It is also important to note, that aside from Cameroon, Central African Republic, DRC and Nigeria scored low in terms of the number of shipments each country detected during the period under review (Table 15).

| Country                  | 2015 | 2016 | 2017 | 2018 | Detection Rate (2016-19) |
|--------------------------|------|------|------|------|--------------------------|
| Nigeria                  | 26   | 28   | 27   | 27   | 16.7%                    |
| Central African Republic | 24   | 20   | 23   | 26   | 0%                       |
| Cameroon                 | 27   | 26   | 25   | 25   | 66.7%                    |
| DRC                      | 22   | 21   | 21   | 20   | 0%                       |

Table 15 - Countries scores according to the Corruption Perception Index

## Market Dynamics

**WJC analysts have collated** insightful data sets to give a fuller picture of the pangolin trafficking market from 2016-2019, including both wholesale and retail prices. WJC undercover investigators negotiate with brokers to get the most accurate street value of the smuggled product and the delivery costs.

**In total**, 44 data points were collected during WJC investigations from six Asian countries, offering a regional perspective, albeit of a limited nature. Prices were also obtained from Nigeria.

**According to WJC investigations**, the market in Asia is primarily for pangolin scales rather than other parts of the animal. Many traders offered the possibility of delivery to China, with prices varying from the equivalent of USD 70 to USD 140 per kg. Based on an annual average calculation for each country, prices in Lao PDR are much higher than other Asian markets. A similar trend can be observed in the sale of illegal ivory, particularly when comparing the Laotian and Vietnamese markets. However, the disparity may also be because prices obtained for Vietnam are predominantly wholesale, whereas in Lao PDR prices were only obtained at a retail level.

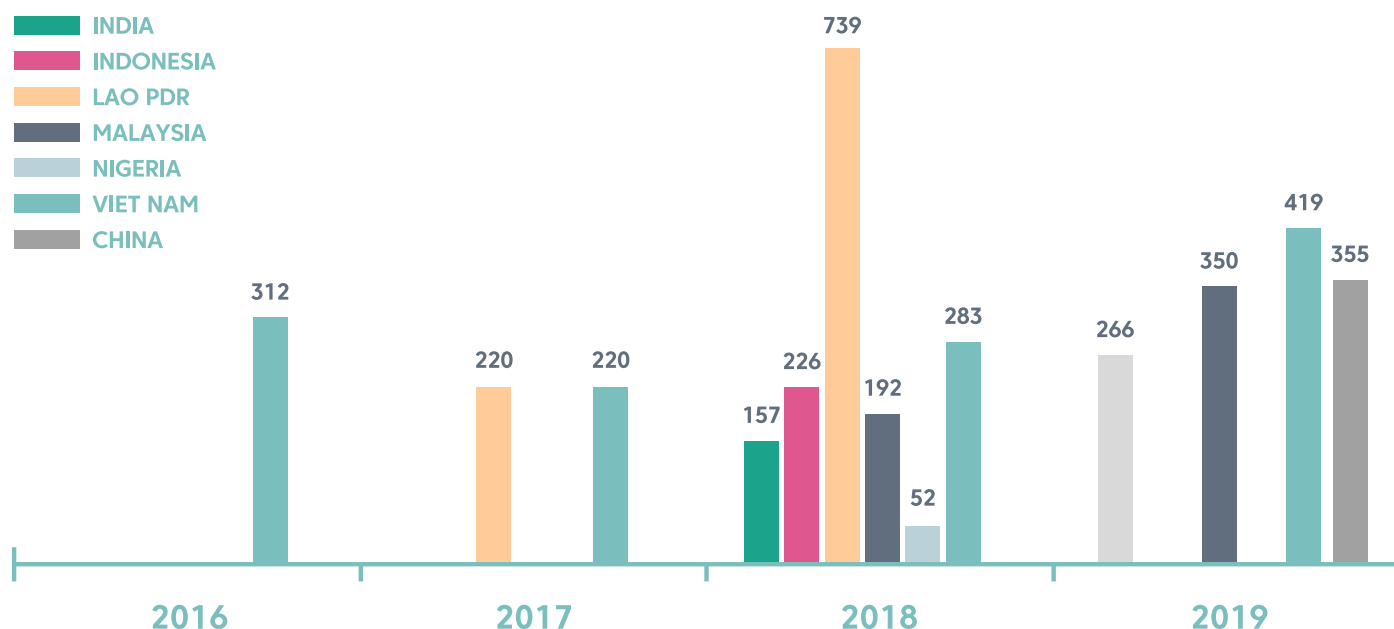


Chart 4 - Average price of scales by country per year (per kg / USD).

**As expected**, the prices observed in Africa and Asia differ significantly. In Africa, organised criminals responsible for transporting the scales have to make it worth their while and will send out large shipments to limit the marginal cost. Within the pangolin trade, just as in other illegal transnational trafficking, the product on offer will be more expensive along the chain towards the end user. As such, the price of scales (wholesale) in Nigeria is also much lower than in Asian consumer countries (Chart 4).

**Longer term trends** are currently only available for Vietnam and indicates an increase in the value of raw pangolin scales since 2016 (Chart 5).

**It is notable that** around 62% of prices provided by brokers and traders were given in Chinese RMB, rather than Vietnamese Dong, which highlights the role of the Chinese market in this trade. The biggest influence on price could be observed from the quantity of scales under negotiation with higher quantities resulting in a lower price being offered, as 80% of the prices obtained were defined as wholesale.

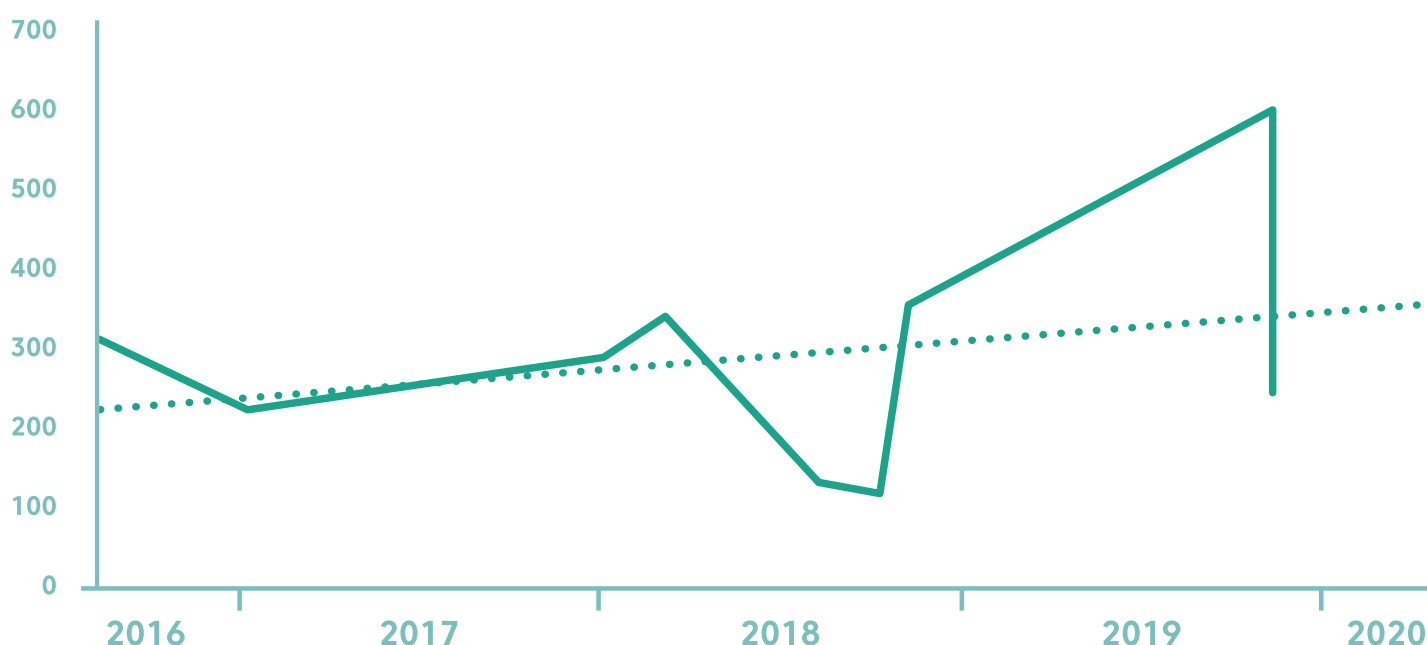


Chart 5 - Average values of scales in Vietnam (2016-2019, per kg / USD).



## Undetected Scales in Illegal Trade

The rate and scope of organised pangolin scales trafficking has been quantified in this report based on detected shipments and reported seizures only.

However, during the same time frame, there is evidence that in addition to this, dozens of tonnes of pangolin scales are being successfully smuggled into illegal trade. This is also underscored by the poor detection rates many of the most prolifically involved countries score, such as Nigeria and DRC and is further compounded by the generally accepted rule that most illegal shipments go undetected.



Image 24: Part of the 10,65 tonnes of scales seized in China<sup>86</sup>.

This was illustrated most recently in October 2019 after Chinese authorities seized a shipment containing 10.65 tonnes of pangolin scales concealed with sliced ginger and subsequently arrested 18 suspects. Authorities established that since November 2018 the network had also smuggled two additional shipments equating to 12.56 tonnes, bringing the total amount smuggled by one network to 23.21 tonnes. Authorities reported that a target in Nigeria hired a smuggling network to ship the pangolin scales from Nigeria to Busan in South Korea and used a different Chinese smuggling network to transport the shipment from Busan to China.

WJC investigations have further documented tonnes of illegal pangolin scales that were successfully smuggled into Vietnam, available for sale. A number of examples show that despite the overall improvement in detection and reporting rates, traffickers continue to successfully smuggle large quantities of pangolin scales across multiple borders.

## March

The WJC had contact with a Vietnamese person of interest regarding the sale of pangolin scales. The target stated he had access to two tonnes of pangolin scales for sale in Hanoi at 2,350 RMB per kg. (Images 25, 26).



*Image 25 and 26: Batches of pangolin scales offered for sale in Hanoi.*

## September

The WJC worked closely with the Environmental Police in Vietnam to target and arrest one male and seize 780 kg of pangolin scales. The WJC had negotiated a deal with the subject by which he agreed to sell one tonne of pangolin scales at 900 RMB per kg<sup>87</sup>.

The suspect also stated to WJC undercover operatives that although there were only 750 kg of scales available at the visited premises (where the seizure of 780 kg subsequently took place), there were four to five tonnes of scales being kept in a warehouse, some 500 m away from where the sighting took place.



*Image 27 and 28: Pangolin scales shown to WJC operatives during sighting.*



2018

## October

The WJC had contact with a Vietnamese person of interest regarding the sale of pangolin scales. The WJC continued to engage the target after he offered 70 kg of scales at 1,800 RMB per kg and during 2018 he stated he had access to an additional six tonnes of scales for sale in Hanoi at 900 RMB per kg (Images 29-31).



Image 29, 30 and 31: Scales as part of a six-tonne batch.



2019

## December

The WJC received intelligence concerning stockpiles of scales that paralleled previous stockpiling of significant batches of ivory trade within Vietnam (Images 32-34), due to difficulties in smuggling it over the border into China. Evidence from one Vietnamese person of interest, with connections to Nigeria, stated that he had access to more than two tonnes of pangolin scales in Vietnam, but had only managed to smuggle a small percentage of it over the border into China.



*Image 32, 33 and 34: Batches of pangolin scales being held in Vietnam.*



**The trafficking of pangolin scales** is significantly growing year on year to what has now become an industrial scale transnational crime, which threatens the existence of an entire species. Concerningly, analysis finds the volume being trafficked is rapidly escalating. With populations of the four Asian species seemingly too depleted to still be considered a profitable prospect, criminal networks are now targeting its African counterparts.

**Analysis by the WJC** Intelligence Development Unit sought to understand the problem by assessing how pangolin scales as a raw commodity are being trafficked and which countries/territories are vulnerable to this organised criminality. Direct connections and clear parallels between the trafficking patterns for pangolin scales and ivory points to the likelihood of the same syndicates being involved in the trafficking of both commodities. The marked increase in mixed shipments demonstrates the fluidity of the organised crime networks to adapt to changes in the market as the price for ivory decreases and the price for pangolin scales increases.

**However**, much more needs to be learned about the commercial-scale operations to harvest and process pangolins in Africa which primarily centre on Nigeria

after a significant proportion of trafficking is attributed to the country. The analysis prepared for this report shows a shift from the ports in Africa from east to west and it is suggested this is due to syndicates operating in that space. It also highlights the same destination/territories countries in Asia – namely China, Vietnam and Hong Kong SAR – as the recurring entry points into Asia to supply the end use market in China.

**While there have been** some notable successes in the detection and confiscation of smuggled pangolin scales, there is also clear evidence that large volumes of pangolin scales are smuggled without being detected. The consistent increase in the volume of shipments demonstrates the trafficker's confidence in their connections at the ports. It also demonstrates an ability of the syndicates to weather the financial hits taken when such significant consignments are seized by authorities.

**Available reports on arrests** linked to seizures indicate that the majority were made in origin countries, and only a few took place in destination countries. Details are very scarce about the arrested suspects; however, they appear to be low level criminals predominantly of Chinese and Nigerian nationalities.



**The on-going smuggling activities** despite large-scale seizures warrants closer consideration. The transportation of commodities is likely to be cheaper when it occurs in greater volume but still does not negate the overall financial loss when shipments are confiscated. Such enforcement action therefore does not sufficiently deter traffickers from continuing these criminal actions. Instead the targeting and prosecution of the high-level traffickers and organisers profiting from this criminality is likely to be more effective. Financial forfeiture following such investigations is also crucial.

**The WJC** believes more in-depth, long-term investigations are needed to better understand the linkages between and across operations of the criminal networks. It believes greater use of controlled deliveries can provide an effective evidence-gathering tool.

**Controlled deliveries** have long been a tool for investigating other types of organised crime, but their use in wildlife smuggling remains limited. As observed with previous interceptions, early arrests may only bring low level criminals or couriers before the courts. In order to better understand the complexity and reach of smuggling networks and ultimately arrest and convict high-level organisers, contraband

must be allowed to travel its entire intended route, in a controlled, monitored manner to enable authorities to gather evidence at each point along the illegal supply chain.

**The success** of this type of long-term investigation has already been demonstrated in China. In October 2019, Chinese authorities confiscated 10.65 tonnes of pangolin scales smuggled from Nigeria, following a year-long investigation that had all the markings of a controlled delivery operation. The scales, mixed with ginger, were bought in Nigeria, shipped to South Korea, and subsequently transferred to their final destination in China. Eighteen suspects were arrested and included high-level organisers<sup>88</sup>.

**Both the amount** of contraband seized, and the number of arrests made in China highlights what can be achieved through lengthy and well-coordinated transnational investigations. The regular use of this enforcement technique could yield remarkable results and the WJC believes that the trafficking of pangolin scales as a raw but high-value commodity is now so serious that investigations at this level are the only solution to bring the organisers of wildlife crime to justice.

<sup>1</sup> <https://www.nytimes.com/2019/02/12/science/hong-kong-wildlife-trafficking.html>

<sup>2</sup> <https://forestsnews.cifor.org/50886/pangolins-under-pressure?fnl=en>

<sup>3</sup> <https://www.pangolinreports.com/nigeria/>

<sup>4</sup> <https://oxpeckers.org/2019/05/africas-pangolins/>

<sup>5</sup> <https://www.transparency.org/country/NGA>

<sup>6</sup> [https://www.customs.gov.hk/en/publication\\_press/press/index\\_id\\_2239.html](https://www.customs.gov.hk/en/publication_press/press/index_id_2239.html)

<sup>7</sup> According to INTERPOL, only 10 to 15 percent of illegal wildlife trade transiting Europe is detected. INTERPOL: Global Wildlife Enforcement: Strengthening Law Enforcement Cooperation Against Wildlife Crime, 2018, p. 10. 11 European [https://www.interpol.int/content/download/5179/file/WEB\\_Wildlife%20Prospectus-March2019.pdf](https://www.interpol.int/content/download/5179/file/WEB_Wildlife%20Prospectus-March2019.pdf)

<sup>8</sup> <http://www.ecns.cn/2017/11-30/282682.shtml>

<sup>9</sup> <https://www.pangolinreports.com/china/>

<sup>10</sup> <https://eia-international.org/blog/wildlife-week-china-must-declare-the-use-of-pangolin-scales-in-traditional-medicine-illegal/>

<sup>11</sup> [http://www.trafficchina.org/sites/default/files/briefing\\_paper\\_of\\_pangolin\\_trade.pdf](http://www.trafficchina.org/sites/default/files/briefing_paper_of_pangolin_trade.pdf)

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<sup>13</sup> Ibid.

<sup>14</sup> <https://www.nationalgeographic.com/magazine/2019/06/pangolins-poached-for-scales-used-in-chinese-medicine/>

<sup>15</sup> <https://www.nationalgeographic.com/magazine/2019/06/pangolins-poached-for-scales-used-in-chinese-medicine/>

<sup>16</sup> <https://archive.shine.cn/metro/society/Customs-finds-3-tons-of-pangolin-scales/shdaily.shtml> ; <https://www.scmp.com/news/china/society/article/2057626/tonnes-endangered-pangolins-scales-seized-shanghai>

<sup>17</sup> <https://www.insurancebusinessmag.com/asia/news/breaking-news/chinese-insurers-to-stop-covering-pangolinbased-medicines-176735.aspx>

<sup>18</sup> <https://www.chinadaily.com.cn/a/201912/12/WS5df-17ba2a310cf3e3557d8f2.html>

<sup>19</sup> <https://www.bbc.com/news/science-environment-47200816>

<sup>20</sup> <https://www.channelnewsasia.com/news/singapore/pangolin-scales-elephant-ivory-largest-seizure-singapore-11412138>

<sup>21</sup> [https://www.bbc.com/zhongwen/simp/fooc/2015/01/150128\\_fooc\\_vietnam\\_pangolin](https://www.bbc.com/zhongwen/simp/fooc/2015/01/150128_fooc_vietnam_pangolin); <http://www.martinanthonyfletcher.com/pangolins-in-peril>; <https://wildaid.org/wp-content/uploads/2017/09/WildAid-Pangolins-on-the-Brink.pdf>

<sup>22</sup> <https://www.pangolinreports.com/avoid-pangolins-tcm/>

<sup>23</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2797502/>; <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0117199&type=printable>; <https://pdfs.semanticscholar.org/14e7/8e4c9c968d1320b05e0db55dacc5f9f4dd1.pdf>

<sup>24</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2797502/>; <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0117199&type=printable>; <https://pdfs.semanticscholar.org/14e7/8e4c9c968d1320b05e0db55dacc5f9f4dd1.pdf>; <https://ethnobiomed.biomedcentral.com/track/pdf/10.1186/1746-4269-10-76>

<sup>25</sup> Pangolins on the brink as Africa-China trafficking persists unabated, 2018: <https://news.mongabay.com/2018/05/pangolins-on-the-brink-as-africa-china-trafficking-persists-unabated/>

<sup>26</sup> [https://www.fws.gov/international/images/mentor-pop/WorldPangolinDay2017\\_trifold\\_final.pdf?utm\\_source=IA%20Website&utm\\_campaign=Downloaded%20Pangolin%20Trifold%20Brochure%20\(Print%20Version\)&utm\\_medium=Website](https://www.fws.gov/international/images/mentor-pop/WorldPangolinDay2017_trifold_final.pdf?utm_source=IA%20Website&utm_campaign=Downloaded%20Pangolin%20Trifold%20Brochure%20(Print%20Version)&utm_medium=Website)

<sup>27</sup> [https://www.rufford.org/projects/ndameu\\_benoit\\_anthony](https://www.rufford.org/projects/ndameu_benoit_anthony)

<sup>28</sup> Africa Pangolin Working Group on Africa Geographic Magazine <https://magazine.africageographic.com/weekly/issue-10/chinks-in-the-pangolins-armour/>

<sup>29</sup> <https://www.reuters.com/article/us-nigeria-pangolins/nigeria-becomes-africas-staging-ground-for-the-illegal-pangolin-trade-with-asia-idUSKBN1W4055>

<sup>30</sup> <https://www.nationalgeographic.com/animals/mammals/group/pangolins/>

<sup>31</sup> Ibid.

<sup>32</sup> <https://wildaid.org/wp-content/uploads/2017/09/WildAid-Pangolins-on-the-Brink.pdf>

<sup>33</sup> Ibid.

<sup>34</sup> <https://www.essenceoftheages.com/highland/hi1.html>; <https://druksell.com/products/bhutan-incense>

<sup>35</sup> <https://edition.cnn.com/interactive/2014/04/opinion/sutter-change-the-list-pangolin-trafficking/>

<sup>36</sup> Ibid.

<sup>37</sup> WWF/TRAFFIC/IUCN <https://oxpeckers.org/2018/07/scales-horns-and-skins-available-online/>

<sup>38</sup> Paul Hilton/WildAid <https://wildaid.org/wp-content/uploads/2017/09/WildAid-Pangolins-on-the-Brink.pdf>

<sup>39</sup> <http://www.paxtag.org/wp-content/uploads/2015/05/Challender-2015-Understanding-markets-to-conserve-trade-threatened-species-in-CITES.pdf>

<sup>40</sup> <https://wildaid.org/wp-content/uploads/2017/09/WildAid-Pangolins-on-the-Brink.pdf>

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<sup>42</sup> [https://www.theepochtimes.com/this-chinese-restaurant-can-get-you-freshly-slaughtered-meat-from-the-critically-endangered-pangolin\\_2042129.html](https://www.theepochtimes.com/this-chinese-restaurant-can-get-you-freshly-slaughtered-meat-from-the-critically-endangered-pangolin_2042129.html); [http://shanghaiist.com/2017/02/07/pangolin\\_banquet/](http://shanghaiist.com/2017/02/07/pangolin_banquet/)

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<sup>44</sup> <http://www.martinanthonyfletcher.com/pangolins-in-peril>

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<sup>46</sup> [https://gongyi.ifeng.com/news/detail\\_2012\\_04/17/13947462\\_12.shtml](https://gongyi.ifeng.com/news/detail_2012_04/17/13947462_12.shtml)

<sup>47</sup> TRAFFIC on Africa Geographic Magazine <https://magazine.africageographic.com/weekly/issue-10/chinks-in-the-pangolins-armour/>

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<sup>56</sup> <https://wildaid.org/smugglers-turn-to-endangered-pangolin-scales-as-chinas-ivory-ban-bites/>

<sup>57</sup> <https://www.thethirdpole.net/en/2019/05/03/the-plight-of-the-pangolin-in-china/>

<sup>58</sup> <https://www.thestar.com.my/news/nation/2019/05/26/experts-weve-lost-battle-on-rhino-conservation/>; [http://www.chinadaily.com.cn/cndy/2019-06/19/content\\_37482294.htm](http://www.chinadaily.com.cn/cndy/2019-06/19/content_37482294.htm); [http://www.trafficchina.org/sites/default/files/briefing\\_paper\\_of\\_pangolin\\_trade.pdf](http://www.trafficchina.org/sites/default/files/briefing_paper_of_pangolin_trade.pdf)

<sup>59</sup> <https://www.nationalgeographic.com/magazine/2019/06/pangolins-poached-for-scales-used-in-chinese-medicine/>

<sup>60</sup> <https://www.insurancebusinessmag.com/asia/news/breaking-news/chinese-insurers-to-stop-covering-pangolin-based-medicines-176735.aspx>

<sup>61</sup> <https://phys.org/news/2019-05-vietnam-seizes-tonnes-pangolin-scales.html>

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<sup>63</sup> <https://www.sciencedirect.com/science/article/pii/S235198941500089X#br000010>; [https://pdfs.semanticscholar.org/dd51/46a9337bfc33cc4e34ea871849dcc02c01f7.pdf?\\_ga=2.198230127.1741878928.1561622653-958767900.1561622653](https://pdfs.semanticscholar.org/dd51/46a9337bfc33cc4e34ea871849dcc02c01f7.pdf?_ga=2.198230127.1741878928.1561622653-958767900.1561622653)

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<sup>69</sup> <https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-069-03.pdf>

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<sup>71</sup> Challender and Tikki Hywood in IUCN Implementation of CITES Decisions 17.239 b) and 17.240 on Pangolins (*Manis* spp.), page 94 - <https://cites.org/sites/default/files/eng/com/sc/69/E-SC69-57-A.pdf>

<sup>72</sup> This 'count' may lead to several of the same seizures featuring in different countries 'count', therefore the total weight associated at a country level is much higher than the total weight of pangolin scales seized during the period under review.

<sup>73</sup> Relates to the proportion of seizures detected in-country, compared to shipments that have originated, transited or were destined for certain countries.

<sup>74</sup> <https://link.springer.com/article/10.1007/s11417-017-9255-8>

<sup>75</sup> <https://www.transparency.org/cpi2018>

<sup>76</sup> <https://www.scmp.com/news/hong-kong/health-environment/article/3048633/pangolin-scale-smugglers-few-culprits-arrested>

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<sup>80</sup> <https://wildlifejustice.org/significant-changes-in-dynamics-ivory-trafficking/>

<sup>81</sup> <https://wildlifejustice.org/significant-changes-in-dynamics-ivory-trafficking>

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<sup>85</sup> <https://www.transparency.org/cpi2018>

<sup>86</sup> <https://www.chinadaily.com.cn/a/201912/12/WS5df-17ba2a310cf3e3557d8f2.html>

<sup>87</sup> <https://wildlifejustice.org/investigation/operation-pluto-pangolins/>

<sup>88</sup> <http://www.chinanews.com/sh/2019/12-11/9030315.shtml>



Law enforcement and legal  
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[www.wildlifejustice.org](http://www.wildlifejustice.org)