TRAFFIC

November 2022

SKIN AND
BONES

TIGER TRAFFICKING ANALYSIS FROM JANUARY 2000 TO JUNE 2022

Ramacandra Wong
Kanitha Krishnasamy

TRAFFIC REPORT

A portrait of Sumatran tiger Panthera tigris sumatrae

ACKNOWLEDGEMENTS

CONTENTS

TIGERS TRAFFICKED JANUARY 2000 – JUNE 2022

OVERVIEW

3,377 tigers were confiscated between Jan 2000 and Jun 2022 across 2,205 incidents

85% of tigers were seized in the 13 TRCs across 1,688 incidents

2,300 people (at least) were arrested for involment in tiger trafficking, 95% within TRCs

COUNTRIES

The top 3 countries by number of seizure incidents were **India** (759 - 34% of total), **China** (212 - 10% of total) and **Indonesia** (207 - 9% of total)

185% **Viet Nam**, saw a nearly tripling of tigers confiscated (+185%) between 2018-2021 compared to 2014-2017

More critically endangered **Sumatran Tigers** seized in Indonesia the first half of 2022, compared to all of 2021

COMMODITIES

1/4 of all seizure incidents **involved whole tigers** (totalling 1,319 individuals)

Most frequently seized: **Skins** (902 incidents), **whole tigers** (608 incidents), **bones** (411 incidents)

CAPTIVE SUPPLY

744 tigers at least from confirmed or suspected captive sources - 50% of tigers seized in 2018 and 2019 from these sources

Incidents recording whole tigers from captive sources increased over the years from 9% in 2005 to over 50% in 2018 and 2019

ONLINE TRADE

675 social media profiles in 6 Southeast Asian countries trafficking in tigers were identified, 75% of which in Viet Nam

EXECUTIVE SUMMARY

This report is the fifth iteration of TRAFFIC long-standing worldwide monitoring of the illegal trade in tigers *Panthera tigris*, almost 23 years of seizure data from January 2000 to June 2022.

A tiger cub in the wild

This analysis focuses primarily on seizure incidents in the 13 recognised Tiger Range Countries (TRCs) where urgent and immediate actions are needed to ensure the highest returns to safeguard tigers. It also includes information opportunistically gathered from outside TRCs to provide a more holistic picture of the illegal trade in tigers, while including insights from TRAFFIC's online tiger trade monitoring in six Southeast Asian countries.

This analysis extrapolated a conservative estimate of the number of tigers involved in seizure incidents to provide context to the issue. Throughout this report, the number of tigers confiscated refers to the minimum number of tigers estimated to have been seized[1]. Over two decades is a considerable timeframe for data aggregation, with numerous global changes in tiger protection and management interventions, as well as wider economic, political, and social changes. This analysis does not provide detailed insights into these changes but highlights the most prominent findings from tiger trafficking data and draws attention to the most recent period (2018-2022).

When reading this report, it is important to keep in mind that due to the inherently covert nature of the illegal trade in tigers, the true extent of such crime is unlikely to be reflected by the seizure data reported here alone. While seizures reflect a measure of success from government action and represent an indirect measure of trafficking levels, data is inherently influenced by a number of biases. These include varying levels of law enforcement investment and performance, enforcement effectiveness, rate of wildlife crime per country, different reporting and recording practices of both law enforcement and media and others. Therefore, an increase in seizures in one country may not necessarily imply higher wildlife trafficking levels in comparison to other countries, or higher/lower levels of illegal trade. It is however indicative of the scale of recorded illegality taking place within that specific country. It is also important to keep in mind the distinction between seizure incidents and equivalent number of estimated tigers seized.

Overall, a conservative estimate of **3,377 tigers** was confiscated between January 2000 and June 2022 **across 50 countries** and territories globally, averaging 150 tigers seized per year. These occurred from a total of **2,205 seizure incidents.** Of these, **77% (1,688 incidents) took place within the 13 TRCs**, accounting for a minimum estimation of **2,883 tigers** (85% of the total). India, China and Indonesia recorded the highest seizures over this period, together accounting for 53% of all seizures (1178 incidents). Non-TRCs recorded almost a quarter (23%) of all tiger seizure incidents, totalling 517 incidents over the 22.5-year period.

Tiger seizures in the **first half of 2022** showed a troubling pattern, recording a general increase in seizure incidents across selected TRCs, compared to the median of the first half of the preceding two decades. This was the case for Russia and Thailand, but particularly evident for **Indonesia** - an increase was recorded in seizure incidents and equivalent tigers seized. In Indonesia, the equivalent of 18 tigers were confiscated during the first six months of 2022, double the volumes reported during the same period for 2021 and 2020 and exceeding by 50% the median volume recorded in the same period between 2000-2022. This worrying trend for Indonesia serves as an urgent warning to reverse the trend of further decline for this Critically Endangered sub-species.

TOP SEIZURES

India – home to more than half of the global wild tiger population – remains the top ranked with 759 (34%) seizures incidents and 893 (26%) confiscated tigers. **China** (incidents: 212 – 10%, tigers: 367 – 11%) and **Indonesia** (incidents: 207, tigers: 319) ranked second and third by number of seizure incidents as well as third and fourth by the number of tigers confiscated. **Thailand** reported a relatively smaller number of seizure incidents (65 – 3%), however, ranked second by volume with 403 tigers (12%), which were contributed in large part by a single seizure at the Wat Pha Luang Ta Bua tiger temple involving 187 tigers in 2016.

---

1   The calculation logic to infer the number of equivalent tigers involved in the trade is detailed in the Methodology section from page 49.

The overall number of tiger seizure incidents recorded appeared stable between 2018 and 2021 compared to the preceding 4-year period (2014-2017). This held true for all TRCs except three countries which recorded increases between the two 4-year periods: **Viet Nam (+67%), China (+23%)** and **India (+21%)**. The increases in the number of incidents for all three countries from 2018 to 2021 however showed a different pattern for equivalent confiscated tigers: a decrease in confiscated volumes in China (-5.7%), stable volumes in India, and a sizable increase in **Viet Nam (+185%)**, which saw a nearly tripling of the number of equivalent tigers confiscated.

During the past ten years, the aggregated rate of incidents remained stably above the equivalent of 100 tigers/year. Recent trends, at least in some countries were likely impacted by the policy responses to the COVID-19 pandemic and the resulting disruptions to business trade activities, movements of people and law enforcement efforts and priorities. As trade activities resume, data on crime, recording and reporting may show different trends in the coming years.

Seizures outside TRCs increased ninefold between 2000 and 2014 when they peaked at 51 incidents. During subsequent years the rate remained high but began declining from 2019. When considering the volume of tigers confiscated outside range countries, it remained negligible until 2010, though this was likely also attributed to reduced focus on data collection outside TRCs. The following years saw significant increases, which peaked in 2013 with an estimated 57 tigers confiscated. In the subsequent years, along with the surge in seizure incidents, confiscated volumes remained in the double-digit range until 2021.

three countries recorded increases of tiger seizure incidents in recent years

SEIZED TIGER COMMODITIES

Almost one-third (608 of 2,205) of all seizure incidents involved **whole tigers,** totalling 1,319 individuals: 665 were alive and 654 were dead. The remaining incidents seized tiger parts such as skins and bones. This proportion holds true in the first half of 2022, during which 39% of incidents involved the confiscation of whole individuals (the vast majority of which occurred in six TRCs especially Indonesia and Viet Nam). During the past 23 years, trafficking in whole tigers contributed to a gradually more prominent share of recorded incidents, rising from 7% in 2003 all the way to 47% of the seizure incidents in 2017. Subsequent years witnessed a temporary trend reversal, with seizure incidents involving whole individuals increasing once again to 39% of the total incidents during the first half of 2022.

Tigers sourced from **captive sources** – either confirmed or suspected – clearly played an unwavering role in fuelling the illegal trade in tigers and their parts. Globally, from 2000 to June 2022, at least 744 tigers were thought to have originated from confirmed or suspected captive sources. The share of incidents recording whole tigers from captive sources increased over the years from 9% in 2005 to over 50% in 2018 and 2019, totalling at least 186 incidents across 28 countries. Thailand and Viet Nam featured most prominently, respectively with 81% and 67% of their confiscated tiger volumes suspected to involve captive-bred tigers. Several countries – including Viet Nam and Thailand – have been under the spotlight for their sizable stock of captive tigers. This captive population is suspected to be the source of illegal trade[2].

Whole animals aside, the most frequently **confiscated tiger parts** are skins (1,313 whole, 609 pieces across 902 seizures) and bones (11,528 items and an additional 2.9 tonnes across 411 seizures). However, their share has been trending downwards over the years, compensated by an increase in the frequency of tiger teeth (953 items across 165 seizures), claws (3,101 items across 186 seizures) and other body parts. All tiger body parts have been demonstrated to have a market value: from whiskers (503 items) to paws (129 items) and meat (1.1 tonnes).

tiger skins are the most frequently confiscated tiger part

---

2   This analysis is not able to gauge the true impact of illegal trade from captive stocks vs wild population. Gaps in reliable annual statistics on captive and wild tiger population in each country, including the level of investment to manage and control, prevents such an assessment.

SEIZURE LOCATIONS AND ROUTES

Tiger confiscations occurred in over 1,000 localities worldwide, 81% of which took place in TRCs. The distribution of these sizable seizure incidents was more narrowed down to a limited set of **hotspots**: a) in and around protected areas and **tiger reserves in India, Nepal and Bangladesh**; b) consumption centres in **major cities of Viet Nam**, which have become increasingly prominent in recent years; c)

major international transportation gateways. The analysis of tiger **trafficking routes** over 23 years – based on information available for 28% of the incidents on record – revealed the long-range nature of this trafficking chain from source to market. Half of the incidents feature route legs ranging between 220 and 2,700 km, with a median of 1,000 km and outliers extending up to 12,000 km.

1,000
localities worldwide
were involved with tiger confiscations

ARREST AND PROSECUTION

The analysis of **arrest and prosecution** information – available for 914 seizure incidents – revealed that over **2,313 people were arrested** for confirmed and suspected engagement in tiger trafficking globally between 2000 and June 2022. About 95% (2,203) of the suspects were arrested in TRCs, with the highest numbers recorded from India (1,043 individuals); corresponding with the highest number of cases recorded there. India continues to experience a growing trend in recent years with 134 people arrested in 2021 alone, which could also signal a strength in its enforcement effort.

Reported statistics over the number of arrested suspects from India are significantly higher than those from China (374 people) and Indonesia (227 people). The perspective changes significantly when looking at publicly

documented convictions and penalties: in China, at least 122 people were convicted to serve jail time and 85 people were fined, followed by India (87 jailed, 62 fined) and Indonesia (59 jailed, 51 fined).

Jail sentences ranged between 17 and 72 months within TRCs, with a median of 36 months. Penalties were considerably lower outside of TRCs, most of which ranged between 6 and 25 months, with a median of 11 months. Available data from recent years after 2018 show a positive consolidation of jail penalties between a narrower margin (24-60 months) and especially a higher minimum sentence compared to before (24 months up from nine months previously). Most of the issued fines ranged between USD490 and USD5,200.

over 2,313 people
were arrested for tiger trafficking

ONLINE TIGER TRADE

Between 2019 and 2021, TRAFFIC monitored online markets across six Southeast Asian countries (Cambodia, Lao PDR, Malaysia, Myanmar, Thailand and Viet Nam) and identified at least 675 social media profiles on the Facebook platform engaging in the sale of tiger products. Over 75% of these accounts were from Viet Nam (515), with Thailand ranking a far second with 53 accounts.

Social network analysis revealed a close interconnection between traders offering tiger products and those also offering **ivory, bear** and **rhino horn** products. Elephant ivory was associated with sellers advertising the sale of amulets made of tiger parts. Rhino horn was sold in association with traditional medicinal products derived from tigers, such as bone liquors and bone paste.

RECOMMENDATIONS

TO ENSURE THE SURVIVAL OF WILD TIGERS

Poaching and illegal trade remain perilous threats to the survival of wild tigers. Decades of effort, investments and pledges have not eased pressure on wild tiger populations. Given the clandestine nature of tiger crime, the reported trafficking incidents and detections represent a subset of the actual crime, meaning the full scale of tiger trafficking is likely far higher than that presented here. Without immediate and concerted efforts to bridge the gaps in law enforcement, investigations, prosecution and consumption, current global efforts will have a very limited impact on safeguarding wild tigers from poaching and illegal trade in the long term. TRAFFIC reiterates and emphasises these and past recommendations – aimed largely at governments primarily in TRCs – to improve law enforcement effectiveness and legal and policy frameworks, more transparently regulate captive tiger facilities, as well as invest in evidence-based solutions to reduce the demand and consumption of tiger parts and derivatives. Specifically, the following actions are recommended:

STRENGTHEN CRIMINAL JUSTICE RESPONSE

- Intelligence-driven investigations to **dismantle criminal networks** operating all along the illegal trade chain from point of source to market. Without this, seizures only remove low-level operatives and perpetuate the problem without effectively halting or reducing it. Financial investigations should be pursued to achieve this goal, along with cross-border collaboration on investigations.

- **Strong and predictable prosecution is crucial** for ensuring an effective deterrent to tiger trafficking crimes. Ever increasing penalties may not be as effective as hoped, instead increasing the likelihood of traffickers getting caught and convicted in the first place can more effectively influence the cost-benefit evaluation of prospective criminals. Given the commercial nature of tiger trafficking, **financial penalties** continue to be disproportionately low according to available data (in most part between USD490 and USD5,200D). In all TRCs, the opportunity to profit from trafficking in tigers still far outweighs the potential loss. As countries improve legislation against wildlife crime, suspects are likely to increasingly employ skilled defence lawyers. Effort to **boost investigation and prosecution skills**, including the handling of evidence, is crucial in the ability of governments to secure strong convictions.

- Several TRCs still have considerably low penalties and loopholes within national legislation that may pose as an avenue to evade strong prosecution. These **legislative gaps should be closed**, to give governments the upper hand in combatting this crime.

CLOSE ILLEGAL MARKETS

Markets that are selling tiger parts and products must be **shut down** by governments. These markets and the commercial platforms (for online trade) encourage the people behind the markets to operate with impunity, and seriously undermine the investments to eradicate tiger trafficking.

CONTROL FACILITIES HOLDING AND BREEDING CAPTIVE TIGERS

Facilities holding and breeding captive tigers must be subject to robust **laws, regulations and enforcement** in line with CITES Resolution Conf 12.5 (Rev CoP18)[3] and its relevant Decisions. Provisions to review current management and control mechanisms, register, monitor and audit captive facilities, including restricting the size of captive populations in any location or facility (including those considered to be farms), and the disposal of dead specimens are of paramount importance.

Travel restrictions from COVID-19 pandemic and funding gaps significantly delayed and compromised the CITES missions and efforts to **inspect captive breeding facilities**[4]. These should be prioritised, with an assurance of the right expertise and guidelines available to the teams conducting such missions, to uphold the purpose of the missions in ensuring full compliance with the relevant CITES Provisions to reduce and eradicate illegal trade. Transparency in this process is fundamental to prevent laundering or leakage of stocks, especially considering that a high percentage of seizures include captive-sourced tigers (up to 81% of Thailand and 67% of Viet Nam confiscated volumes).

As **farms** have a commercial purpose, they cannot be economically viable without involvement in some trade activity, and therefore their continued existence will likely mean ongoing (illegal) trade. Those found breeding for trade should be closed, in line with CITES Decision 14.69[5] which prohibits tiger breeding for trade.

REDUCE DEMAND

Well-targeted actions to reduce demand for illegal tiger parts and derivatives through evidence-based and country-specific approaches is crucial. Data on seizures as well as physical and online markets emphasise the ongoing demand, requiring urgent interventions implemented jointly by governments, research organisations, NGOs, private sector and relevant experts. Effort to **deter consumers and traders from buying and selling illegal products** must be carefully undertaken, including through targeted behaviour change interventions and campaigns.

---

3   https://cites.org/sites/default/files/document/E-Res-12-05-R18.pdf; https://cites.org/eng/dec/index.php/42069
4   https://cites.org/sites/default/files/documents/E-CoP19-68.pdf
5   https://www.cites.org/eng/dec/valid17/81842

FORENSICS PROFILING AND DATA MANAGEMENT

DNA profiles of confiscated specimens must be undertaken. **Other identification features** (such as photographic evidence) of tiger stripe patterns and confiscated individuals and parts (e.g. skins) should be recorded and maintained in a centralised government register and reported to the CITES Secretariat. This should also be applied to tigers held in captive facilities. This effort will provide an invaluable law enforcement tool to help trace the source of seized items and prevent potential laundering activity. Without these measures, it is impossible to ascertain if seized tigers from such captive sources are part of previously held stocks or were newly acquired ones, including those potentially from the wild.

DATA SHARING & COLLABORATION

Transparency of law-enforcement actions is crucial to allow the development of effective data-driven policy decisions concerning tiger conservation. Governments should leverage on quantitative data disclosure to foster greater inter-governmental collaboration and civil society engagement. The international nature of this crime requires more **effective information sharing** between countries, for example, by replicating across the TRCs the best practices developed by the regional TWIX[6] data management networks (Trafficking in Wildlife Information eXchange) already operating in Europe and Africa.

RESEARCH

Deeper research and evaluation into tiger trafficking cases could yield insightful options to **support more comprehensive problem-oriented solutions and interventions**. These could include:
a) deeper scrutiny into prosecution and conviction outcomes;
b) comprehensive review of laws, regulations and policies on tiger trafficking from source to consumption; c) assessment of convergence across crime types associated with tiger poaching and trafficking (such as firearms, money laundering, transportation modes etc.), to achieve the best conviction outcomes for deterrence. These are closely linked to the above-mentioned transparency in data and information sharing and should be viewed as part of a broader solution to tackle a highly complex cross-border problem.

---

6   https://www.traffic.org/what-we-do/projects-and-approaches/supporting-law-enforcement/twixs/

BACKGROUND & INTRODUCTION

OVER THE PAST DECADES, WILD TIGER *PANTHERA TIGRIS* POPULATION HAS BEEN ON A DOWNWARD SPIRAL WORLDWIDE

A Sumatran tiger Panthera tigris sumatrae *lurking from the bushes*

While habitat loss, poor land use and management and conflict with humans pose pressures to tigers, poaching and illegal trade are currently the foremost causes threatening the long-term survival of this species. Currently found in less than 6% of its historical range, the global tiger population is estimated to be around 4,500 individuals, having plummeted from the 100,000 tigers estimated at the start of the 20th century[7]. This rapid decline has placed wild tigers amongst the most severely endangered animals globally. Globally, 13 countries are recognised as Tiger Range Countries (TRCs). Currently, only eight range states have breeding wild populations (map 1): Bangladesh, Bhutan, India, Indonesia, Malaysia, Nepal, Russia, and Thailand. China (WWF, 2015) and Myanmar have also recorded a breeding population, but this population might depend in part on tigers migrating from neighbouring countries. Wild tigers also occurred in Cambodia, Lao PDR and Viet Nam, but no known breeding populations currently exist (Goodrich *et al.*, 2015). All 13 countries are considered TRCs in this analysis.

8
range states
have breeding wild populations

MAP 1
Tiger resident extant (black) and presence uncertain (yellow) locations across Asia. Source: IUCN Red List accessed June 30, 2022.

Efforts to safeguard tigers over the past two decades have met significant challenges, with poaching and illegal trade constantly undermining such efforts. Walsto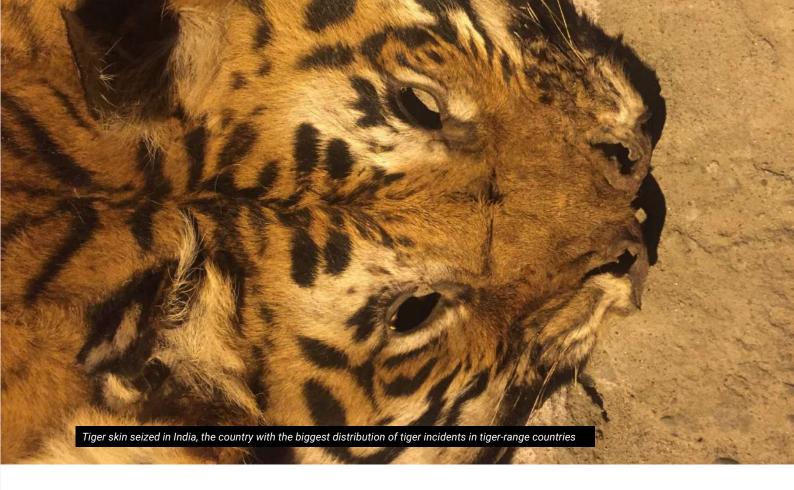n *et al.* (2010) estimated 2,154 individual tigers globally in 2010. In 2016, this estimate increased to approximately 3,900 tigers (WWF, 2016). Efforts by governments and NGO partners in more recent years indicate a population of around 4,500 animals (IUCN, 2022; Panthera, 2022), in part attributed to an increase in survey coverage, better analytical techniques and improved enforcement effort. Preliminary surveys indicate that India and Nepal contributed the most to the increase in reported tiger numbers (Panthera, 2022). However, this increase does not apply across all the TRCs while poaching and illegal trade remains a major and persistent problem. Despite the reverence for this iconic animal, TRCs in Southeast Asia are struggling to protect their remaining wild tiger populations. Since 1975, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has listed all tiger subspecies in Appendix I (with the exception to *P. t. altaica* which was included later in 1978).

This effectively means that all commercial international trade of tigers, their parts and derivatives is prohibited. CITES Resolution Conf 12.5 (Rev CoP18), which addresses the conservation and trade of all Asian big cats, serves as the foundation for the implementation of CITES. It includes calls for increased enforcement, international cooperation and collaboration, the regulation of captive and breeding facilities of tigers and reducing demand for tiger parts and products. These efforts have been met with varying impediments, despite numerous global commitments and pledges to address them. This report assesses the seizure incidents of tigers and their parts since 2000, while highlighting trends from the most recent period (January 2018-June 2022). It focuses on seizure incidents within TRCs, where urgent and immediate actions will yield the highest returns to safeguard tigers. It also includes information on the online tiger trade in Southeast Asia to provide a broader perspective and insights. **See page 49** for Methods used in this analysis.

A wild tiger lying down during daytime

SEIZURE INCIDENTS

BETWEEN 2000 AND JUNE 2022, THERE WERE 2,205 CONFISCATIONS OF TIGERS AND THEIR PARTS IN OVER 50 COUNTRIES AND 270 PROVINCES WORLDWIDE, WITHIN THE 13 TCRS AND 39 NON-TRCS[8].

Evidence of tiger skin and bones in an August 2022 case involving Bener Meriah's former regent in Aceh, Indonesia

8   Single incidents may involve the confiscation of multiple tigers or smaller fractions of one (e.g. one claw, skin pieces, or canines).

Tiger skin seized in India, the country with the biggest distribution of tiger incidents in tiger-range countries

Over 77% of all seizure incidents known to TRAFFIC occurred within TRCs (1,688), topped by India, China, and Indonesia (**Figure 1**). Among non-range countries, a sizable number of seizure incidents were reported by the UK, as well as the Netherlands and Germany. Information from non-TRCs was primarily attributed to transparency and data-sharing agreements with TRAFFIC.

FIGURE 1

Distribution of top tiger seizure incidents in TRCs (orange) and non-TRCs (grey) between 2000-June 2022

759 IN

212 CN

207 ID

135 VN

110 NP

60 RU

66 MY

36 BD

65 TH

126 GB

61 NL

57 DE

55 MX

43 FR

IN: India, CN: China,. ID: Indonesia, VN: Viet Nam, NP: Nepal, RU: Russia, MY: Malaysia, TH: Thailand, BD: Bangladesh, GB: United Kingdom, NL: Netherlands: DE: Denmark, MX: Mexico, FR: France

By location of seizure, four of the top five states/provinces were in India: Madhya Pradesh (108), Maharashtra (105), Karnataka (83), and Uttar Pradesh (77). The top fifth was Bagmati province of Nepal (54 seizures). (**Figure 2**).

FIGURE 2

Tiger seizure incidents in key states/province across Asia. Where no number is specified, the state/province has recorded less than three seizures.

Seven live Indochinese tiger cubs, including these ones, were rescued in in the central province of Nghe An, Viet Nam in August 2021

ESTIMATED NUMBER OF TIGERS CONFISCATED

From the 2,205 seizure incidents, a minimum estimated 3,377 tigers have been confiscated from illegal trade between January 2000 and June 2022. Of these, 2,883 tigers were confiscated in TRCs (85% of the total), mostly in India, consistent with the high number of incidents recorded there. India was followed by Thailand, China, Indonesia, and Viet Nam (**Figure 3**). Although Thailand reported a relatively smaller number of seizure incidents, the high volume seized was contributed in large part by a single seizure at the Wat Pha Luang Ta Bua tiger temple involving 187 tigers in 2016.

3,377
tigers confiscated between January 2000 and June 2022

Distribution of equivalent tigers confiscated in top TRCs (orange) and non-TRCs (grey) between January 2000 and June 2022
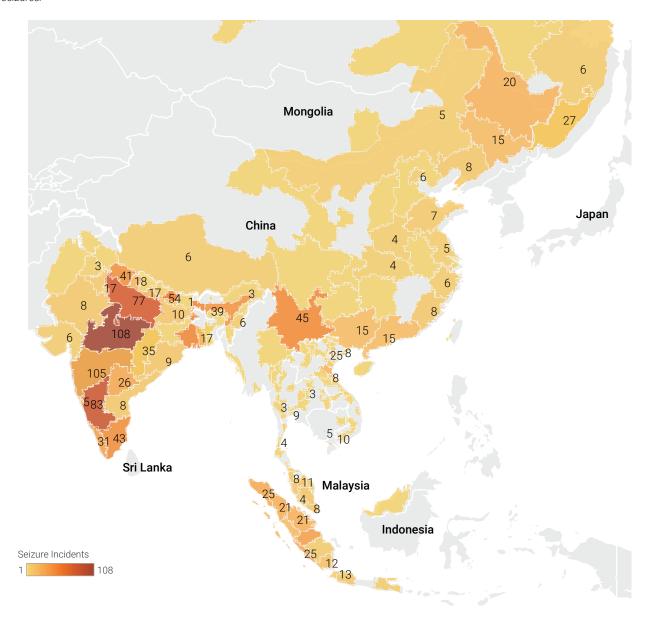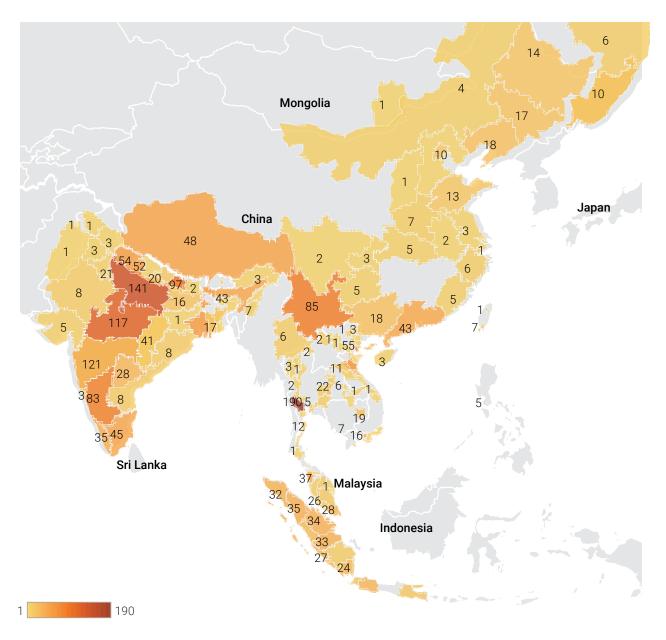

IN: India, CN: China,. ID: Indonesia, VN: Viet Nam, NP: Nepal, RU: Russia, MY: Malaysia, TH: Thailand, BD: Bangladesh, MM: Myanmar, GB: United Kingdom, NL: Netherlands: DE: Denmark, MX: Mexico, FR: France

The map in **Figure 4** portrays the top locations by volume of tigers confiscated in Asia by state/province. Kanchanaburi province of Thailand was the top location with 190 tigers seized (147 alive, 43 dead), largely attributed to a single seizure in a tiger temple in 2016.

The Indian states of Uttar Pradesh (141), Maharashtra (121), Madhya Pradesh (117) and the Nepalese province of Bagmati (97) ranked highest, consistent with the highest number of seizure incidents (**Figure 2**) that took place there.

Number of equivalent tigers confiscated in key states/provinces across Asia January 2000-June 2022

Not included in the maps of **Figure 2** and **Figure 4**, this analysis also found an additional 571 seizure incidents and a minimum estimate of 596 confiscated tigers[9] distributed across Europe (478 incidents, 423 tigers), the Americas (75 incidents with 132 tigers), Africa (9 incidents, 27 tigers), Western Asia (7 incidents with 9 tigers), and Oceania (2 incidents with 5 tigers).

9   This figure represents the minimum estimated equivalent tigers, based on the Methodology detailed in page 49, and records available to TRAFFIC.

THAILAND REPORTED A RELATIVELY SMALLER NUMBER OF SEIZURE INCIDENTS BUT HAS HIGH VOLUME OF TIGERS SEIZED

TIGER RANGE COUNTRIES

Seizure incidents in TRCs amounted to 77% and 85% of the worldwide reported incidents and the number of estimated tigers confiscated, respectively (**Figure 5**).

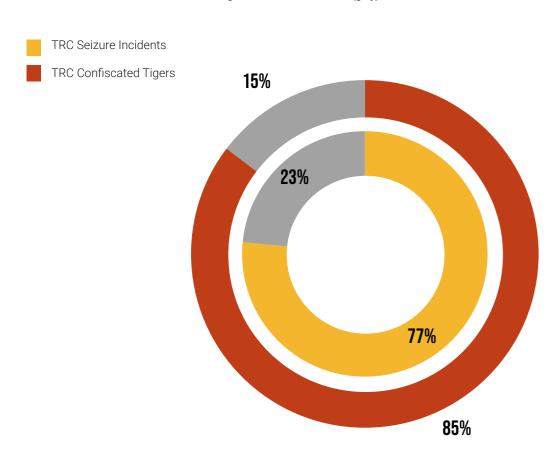India, Thailand, Viet Nam, China and Indonesia ranked among the top five TRCs (**Figure 6**) both by number of confiscated tigers and by number of seizure incidents - with the exception of Thailand where the seizure incidents were disproportionately lower than the number of tigers confiscated. This is attributed to a large number of tigers and their parts seized at tiger temples, especially since 2016 .

FIGURE 5
Share of seizure incidents and confiscated tigers in TRCs versus others (grey).

■ TRC Seizure Incidents
■ TRC Confiscated Tigers

FIGURE 6
Number of confiscated tigers and seizure incidents in tiger range countries January 2000-June 2022 with empasis of seizures from the recent period

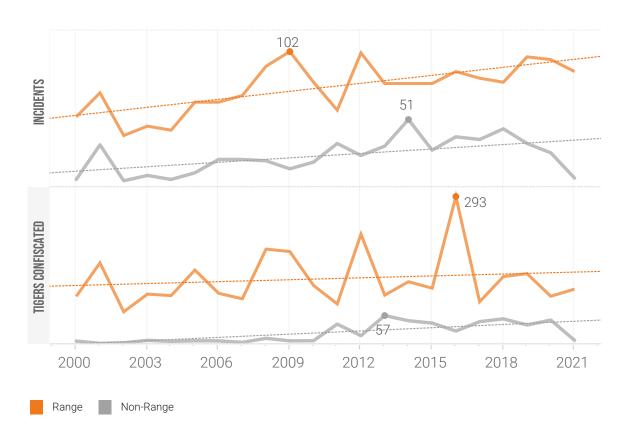| TIGERS CONFISCATED JAN 2000-JUN 2022				
	TIGERS CONFISCATED	SEIZURE INCIDENTS	2018-22 JUN TIGERS	2018-22 JUN INCIDENTS
India	863	759	150	165
China	367	212	66	54
Indonesia	319	207	91	68
Thailand	403	65	34	14
Viet Nam	312	135	118	50
Nepal	190	110	9	10
Malaysia	143	66	9	12
Russia	112	60	17	16
Bangladesh	50	36	2	3
Lao PDR	27	13	8	6
Myanmar	33	8	25	2
Cambodia	27	10	1	5
Bhutan	6	7		
GRAND TOTAL	**2,883**	**1,688**	**530**	**405**

TRENDS

Trafficking trends have generally increased during the past twenty years. The year 2016 may be considered the worst year for tiger trafficking when an estimated 319 tigers were confiscated, with 60% of these (187 tigers) attributed to a single seizure in Thailand at a tiger temple. The highest number of seizure incidents occurred in 2019: 131 incidents involving 178 estimated tigers. From 2018 onwards, the aggregated rate of incidents remained above 100 seizure incidents/year until 2021, when it slightly reduced to 94 incidents, possibly impacted by the policy responses to the COVID-19 pandemic and the resulting disruptions to business and trade activities, movement of people, and government enforcement efforts and priorities (**Figure 7**).

Seizure incidents outside TRCs increased almost ninefold between 2000 and 2014, when they topped at 51 incidents (Figure 7). The volume of tigers confiscated outside TRCs remained negligible until 2010. The following year this started increasing significantly and peaked in 2013 with an estimated 57 tigers seized (Figure 7) and remained in the double-digit range until most recently in 2021. Given the opportunistic manner in which tiger seizure data from non-TRCs was collected, no detailed nor reliable insights can be inferred from this trend.

319
tigers were confiscated
in Thailand in 2016, the highest number on record ever

FIGURE 7

Number of equivalent tigers confiscated in key states/provinces across Asia January 2000-June 2022

Range   Non-Range

TRENDS IN RECENT YEARS (2018-2021)

During the most recent four-year period (2018-2021), recorded global tiger seizure incidents were stable after almost a decade of growth. Notable exceptions were Viet Nam (+67%), China (+23%) and India (+21%) (Figure 8, left). Cambodia also registered an increase, although in very limited volumes. In contrast, significant reductions were reported in Bhutan (-100%), Bangladesh (-75%), Nepal (-29%), Russia (-21%), Thailand (-17%) and non-range countries (-28%), compared to the reported seizure incidents in the previous four-year period (**Figure 8**, **left**).

From the perspective of estimated confiscated tigers, the latest four-year period 2018-2021 reported a significant 19% decrease (**Figure 8 right)**. This trend applied to most TRCs except for Viet Nam which, in contrast, registered a sizable increase in confiscated tigers (+185%) compared to the previous four years (**Figure 8 left**). Russia also registered an increase (+16%) as well as Myanmar, although in limited volumes. Confiscated tigers in non-TRCs decreased by 10% during the most recent period (2018-21) compared to the former, with confiscated tigers breaching 100.
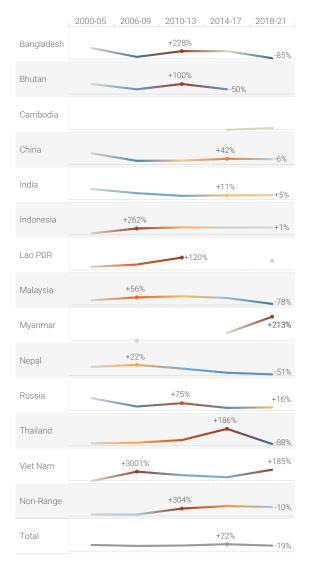
185%

increase in tigers confiscated in Viet Nam in recent years

FIGURE 8

Relative trend variation in seizure incidents broken down by four-year periods, 2002-2021 (left: seizure incidents; right: confiscated tigers)

SEIZURE INCIDENTS

CONFISCATED TIGERS

The seizure at a Thai zoo in November 2020 refocuses the spotlight on the troubling ties between captive tigers and illegal trade and farming

Due to the inherently covert nature of the illegal trade in tigers, its true extent is unlikely to be reflected by this seizure data alone. Seizures reflect success from government actions and are an indication of the level of trafficking, but it is not absolute and the true trafficking levels are likely far higher. Seizure records are an indirect measure of trafficking levels, but the data is inherently influenced by a number of biases, including varying levels of law enforcement effort, investment over time, enforcement effectiveness, rate of wildlife crime per country, different reporting and recording practices of both law enforcement and media, corruption levels and others.

Therefore, an increase in seizures in one country may not necessarily imply higher wildlife trafficking levels in comparison to other countries. It is however indicative of the scale of the captured underlying illegality taking place within that specific country at a particular point in time. More detailed information shared by governments and experts on the level of input from enforcement (such as human and financial resources, effort, prioritisation backed by political will for anti-poaching, anti-trafficking and demand reduction measures) can more realistically enable the assessment of trends in counter-trafficking measures and their effectiveness.
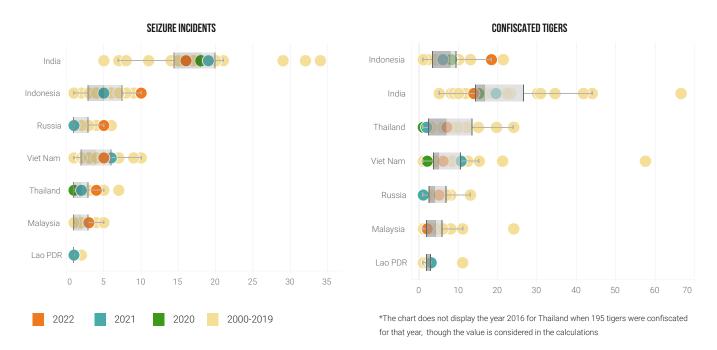
increase in tiger seizures does not imply higher wildlife trafficking levels

2022 TIGER SEIZURE INSIGHTS

During the first six months of 2022, tiger seizure incidents showed a troubling pattern, particularly for some countries. Indonesia, Russia and Thailand (**Figure 9 left**) recorded significant increases in the number of incidents compared to the previous years. India's reported number of incidents was highest, but still below the median of the two preceding decades. Indonesia is the only country that recorded a higher number of seizures in the first half of 2022, compared to all previous years (**Figure 9 left**).

FIGURE 9

Left: Seizure incidents during the first six months (January-June) of every year 2000-2022; right: Confiscated tigers during the first six months (January-June) of every year 2000-2022. Each circle represents cumulative incidents or volume of tigers for the first 6 months of each year. Grey boxes indicate the middle half of the values during the 23 years (interquartile range).

SEIZURE INCIDENTS

CONFISCATED TIGERS

2022   2021   2020   2000-2019

*The chart does not display the year 2016 for Thailand when 195 tigers were confiscated for that year, though the value is considered in the calculations

When looking at the estimated tigers confiscated in the first six months of 2022, Indonesia also stands out, with a significantly higher number of tigers recorded compared to the previous years, second only to the first half of 2009 (**Figure 9, right**). In Indonesia, the equivalent of 18 tigers were confiscated during the first six months of 2022, double the volumes reported during the same period for 2021 and 2020 and exceeding by 50% the median volume recorded 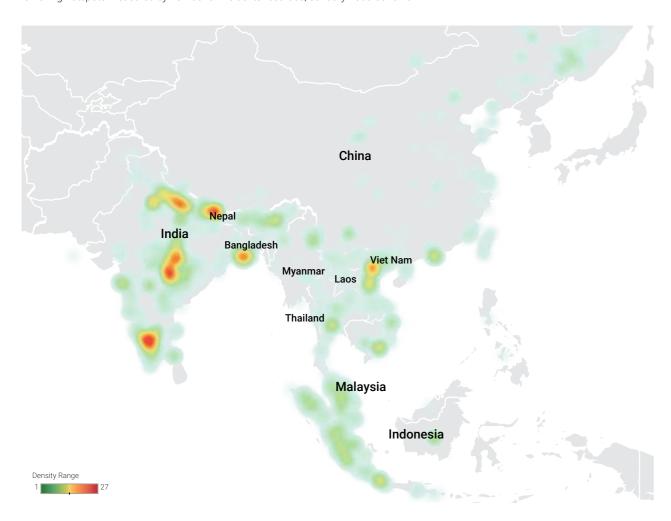in the same period between 2000-2022 (**Figure 9, right**). January-June 2022 confiscated volumes in all other countries were all around or below the median. This troubling trend for Indonesia should serve as an urgent warning to increase effort to prevent this Critically Endangered sub-species from poaching and illegal trade, remaining only in Sumatra after having gone extinct in Java and Bali.

HOTSPOTS

Tiger seizure incidents occurred in over 1,000 localities across the world, 85% of which were in tiger range countries. Despite these sizable numbers, the distribution of seizure incidents was more narrowed down to a limited set of hotspots (**Figure 10**):

		HOTSPOTS IN EACH COUNTRY
	INDIA	Nagarhole tiger reserve (Karnataka), Tadoba Andhari tiger reserve (Maharashtra), Kanha tiger reserve (Madhya Pradesh), Dudhwa national park (Uttar Pradesh), Sundarbans national park (West Bengal) and neighbouring Khulna province of Bangladesh.
	NEPAL	in proximity to Kathmandu.
	VIET NAM	in proximity of Ha Noi and the Nam Phao border crossing with Bolikhamxay province of Lao PDR.
	CHINA	at border gateways between Yunnan province and Myanmar, and the Hunchun national nature reserve in Jilin province neighbouring the Land of the Leopard National Park in Primorsky province of Russia.
	MALAYSIA	incident locations were diffused across peninsular provinces.
	INDONESIA	incident locations were diffused across peninsular provinces where they were spread across the island of Sumatra, but more concentrated in the capital of Jakarta on the island of Java.

FIGURE 10
Trafficking hotspots measured by number of incidents recorded, January 2000-June 2022.

Hotspot locations identified from the perspective of confiscated tiger volumes highlighted similar locations of concern (**Figure 11**). A notable exception was Kanchanaburi province in Thailand where a single seizure incident in 2016 totalled 187 tigers.

FIGURE 11
Trafficking hotspots measured by number of tigers confiscated 2000-2021.

HOTSPOTS IN RECENT YEARS (2018-2022)

During recent years (January 2018-June 2022) tiger trafficking hotspots consolidated in two states of India while new emerged throughout Southeast Asia. The Indian states of Maharashtra and Karnataka remained important hotspots showing a significant concentration of law enforcement actions (**Figure 12**). On the other hand, trafficking in Nepal recorded fewer incidents compared to before. Viet Nam's largest cities and the Nghe An province emerged more prominently as hotspot locations, the same occurred for Sumatra in Indonesia - both in number of incidents and especially in the number of tigers confiscated (**Figure 13**).

FIGURE 12

Trafficking hotspots measured by number of incidents recorded, January 2018-June 2022

FIGURE 13

Trafficking hotspots measured by number of tigers confiscated, January 2018-June 2022.

In August 2021, the police in Nghe An, Viet Nam, reached out to Save Vietnam's Wildlife (SVW) and Pu Mat National Park for assistance in rescuing seven live tiger cubs from illegal wildlife trade

ROUTES

Trade route information was available for 506 incidents (23% globally, 26% among TRCs), with variable degrees of accuracy and reliability. A deeper analysis of the distance covered by individual trade route legs[12] revealed articulated tiger trafficking patterns reflective of the distance from source to market. The middle half of the route (data on record ranged between 220 km and 2,700 km with a median of 1,000 km and outliers extending up to 12,000 km (**Figure 14**).

Distance distribution between reported tiger trafficking route legs, January 2000-June 2022. Each point represents the distance in km covered by one trafficking route leg. The box represents the interquartile range (middle half of the route legs distances) and the whisker represent 1.5 times the upper interquartile range.

Distance (km)

Distance
0 ▬▬▬▬▬▬▬ 11872

---

12   A trade route leg are the known travel segments between stopovers or between a stopover and the departure or destination.

In a raid in Kuala Lipis back in 2018, a town close to Taman Negara, Malaysia's first national park, Malaysian authorities detained six Vietnamese and seized wildlife parts, including two entire tiger skins

Most declared origins of trafficked tiger commodities were India, Indonesia, Viet Nam and Malaysia (**Figure 15**). Several incidents declared destinations such as Viet Nam, China and as far as several countries in Europe.

Reported trafficking routes were predominantly domestic or occurring along cross-border locations heading towards international gateways and consumption centres.

FIGURE 15

Reported trade sources (green) and destinations (orange) of Asia regional tiger trafficking January 2000 and June 2022.

Note: The map chart with source & destination points is static, and not trade routes. It identifies locations that were reported as sources and destinations for each individual trade route leg.

Records of tiger seizure incidents over the decades show a gradual reduction in the distance of the individual trafficking route leg (**Figure 16**). This downward trend in distance per leg became more prominent in 2020-2021, likely following the movement restrictions introduced by policies in response to the COVID-19 pandemic. A reduction in route leg distance does not necessarily imply a reduction in the overall source-to-consumer trade distance. It could, however, result from the improvement in the intelligence gathering and the effectiveness of law enforcement actions upstream in the trade chain in TRCs, where traffickers utilise shorter route legs to move tigers and their parts to avoid detection. More thorough investigations and reporting on the transportation chain would yield more robust information on trafficking patterns, which could aid law enforcement and targeting effort.

FIGURE 16

Trend of average and median trafficking route leg distance from 28% of incidences where this information was reported.

In 2020, five live tigers were rescued from a Thai zoo and transferred to Chulabhorn Wildlife Captive Breeding Center in Si Sa Ket Province for rehabilitation

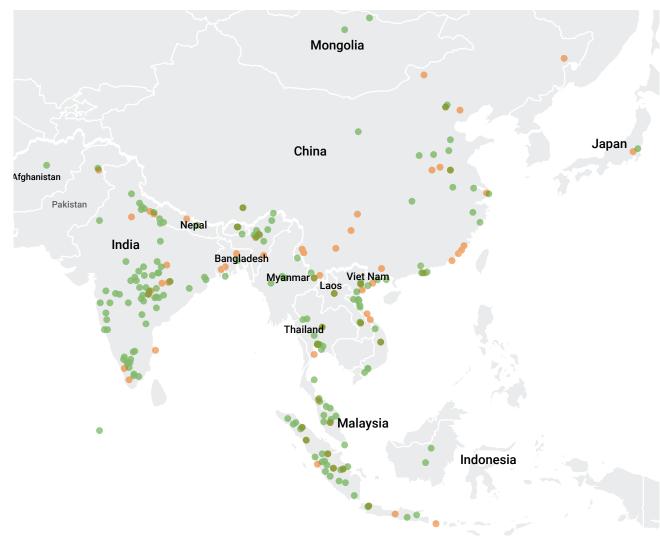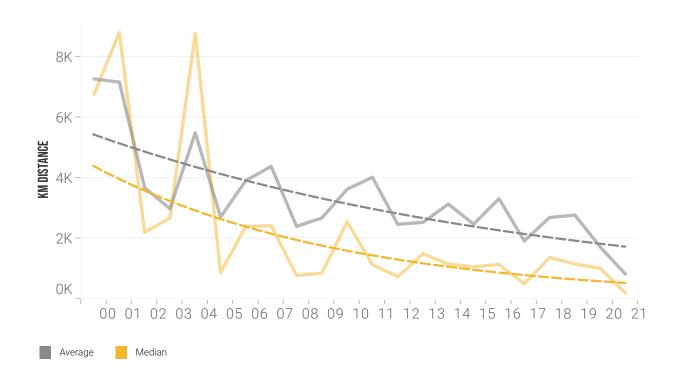# MOST DECLARED ORIGINS OF TRAFFICKED TIGER COMMODITIES WERE INDIA, INDONESIA, VIET NAM AND MALAYSIA

Tiger skins are among the wildlife parts seized during the 2018 Malaysia seizure in Kuala Lipis, Pahang

COMMODITY TYPES

Whole tiger individuals (either live or dead including foetus in one case) were confiscated in over one quarter of all incidents, from 608 incidents involving a total of 1,319 tigers. The majority of the seizure incidents involving whole tiger individuals occurred in Thailand, Lao PDR and Viet Nam (**Figure 17**). The share of tiger seizure incidents featuring whole individual tigers increased throughout the decades peaking at 47% of the incidents in 2017 (**Figure 18**). With a high degree of confidence, the overall trend appears to continue increasing despite what appeared to be a temporary drop during the height of the COVID-19 pandemic period of 2020-2021, rebounding to 39% during the first half of 2022.

Share of seizure incidents involving whole tigers per country between January 2000 and June 2022.

Skins were consistently the most frequently confiscated commodity type, followed by whole tigers and bones (**Figure 19**). Starting around 2013, an increasingly larger share of seizure incidents also captured other body parts and in most recent years particularly teeth and claws. (**Figure 19**).

Number of incidents resulting in the confiscation of each commodity type between 2000 and June 2022. Note: Values cannot be summed across different commodity parts as they may originate from the same seizure incident.

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	Tot..
Skins	37	46	31	41	34	46	40	44	50	67	37	24	34	39	42	57	45	24	38	42	32	36	16	902
Bones	16	17	7	10	3	15	13	17	14	30	18	19	16	22	12	32	22	25	20	32	25	18	8	411
Dead (Individuals)	9	6	4	2	8	10	15	17	27	13	16	13	32	21	17	13	25	28	29	24	22	23	12	386
Live (Individuals)	4	5		2		1	4	1	10	6	9	7	17	12	28	8	15	28	21	18	22	8	6	232
Other Body Parts		1	1	2		2	2	5	2	2	1	20	23	12	29	16	17	9	12	11	15	14	7	203
Claws	2	4	3	6	5	4	5	3	6	8	7	2	5	16	8	10	8	4	11	18	26	17	8	186
Teeth	2	2	1	2	1	9	2	5	7	4	4	7	5	11	9	8	9	6	19	22	16	6		165
Derivatives		26	3	4	2	4	13	14	9	9	12	6	5	3	6	3	9	5	4	7	1			145
Skulls	7	3	3	2	4	5	2		7	6	4	5	8	3	8	4	3	4	10	8	1	2		99
Meat	4	1	1				1	1	1	1	1	3	3		1	9	4	2	3	1	1			39
Paws		1		1			3	1	2	2	3	2		2	3	1	2	1	3	1	2	1		31

Seizure Incidents
1   67

Per TRAFFIC's analysis of this data in the past decade, tiger skins and bones have been consistently the top confiscated commodities over the years, with whole tigers also featuring prominently. Similarly in this study as well, whole tigers (dead and alive), their skins and bones were the most frequently confiscated commodities across almost all regions. By individual item, tiger bone was the most sought-after commodity type by volume, with over 11,528 items and 2,950 kg confiscated. These are primarily used for producing derivatives such as tiger bone glue and tiger infused liquors. Tiger claws (3,101), skin (1,313) and teeth (953) were also popular commodities used in fashion and jewellery.
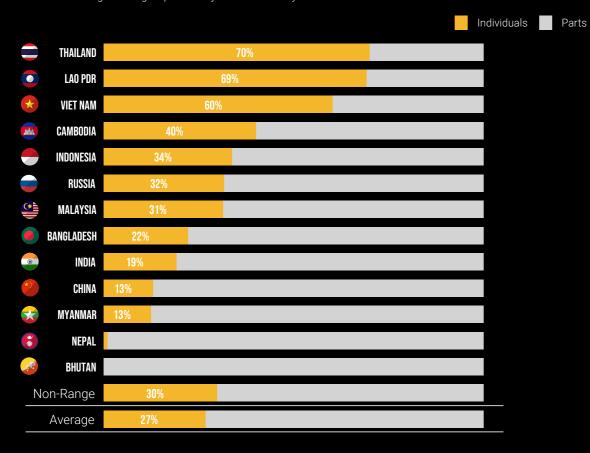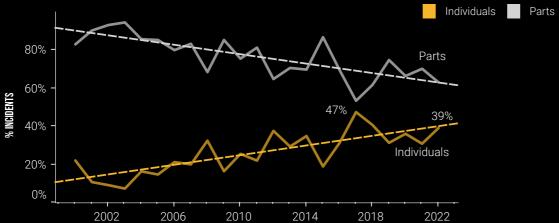
Seizure incidents involving whole tigers accounted for one quarter of the total reported between January 2000 and June 2022, with a growing trend showing peaking at 47% in 2017.

Since 2018, tiger confiscation has decreased as a result of increased law enforcement in India
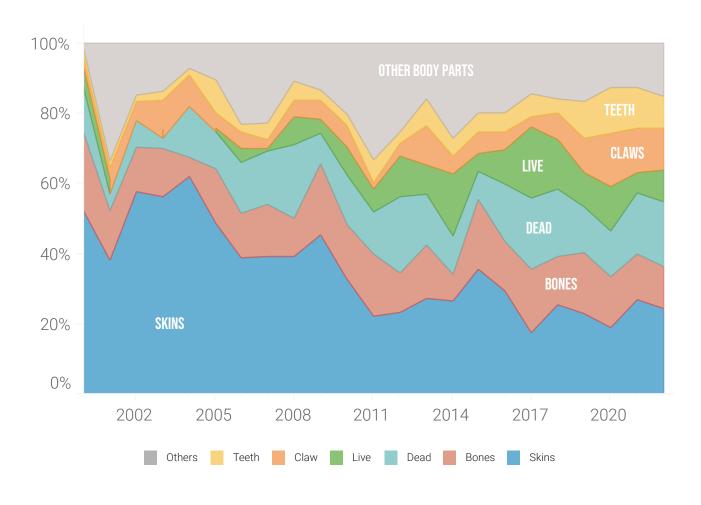
TIGER COMMODITIES SEIZED IN RECENT YEARS (2018-2022)

In the past, tiger trafficking incidents have confiscated largely skins, bones and whole individuals (**Figure 20**). Starting from 2018 the share of confiscated whole tigers (either live or dead) declined, compensated by the increase in the occurrence of teeth and claws, driven primarily by law enforcement in India.

FIGURE 20
Frequency share of different commodity types found in seizure incidents.

CAPTIVE TIGERS

THAILAND AND VIET NAM STAND OUT, WITH OVER HALF OF THE SEIZURE INCIDENTS IN THE TWO COUNTRIES ESTIMATED TO HAVE INVOLVED CAPTIVE-SOURCED TIGERS

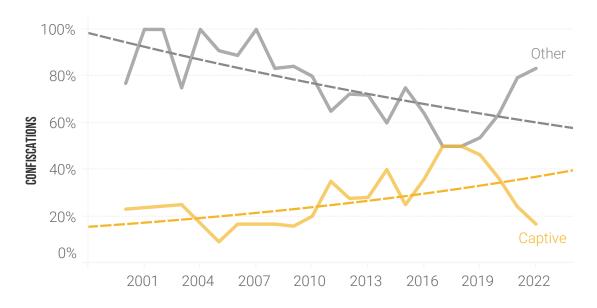*A tiger being kept captive in a cage*

Over the assessed period from January 2000 to June 2022, at least 744 tigers confiscated were reported to be from confirmed or suspected captive sources, with data showing an upwards trend over the decades (**Figure 21**). This suggests that tigers from these sources are leaking into the illegal trade chain. The share of seized captive tigers from these sources increased reaching 50% of the total in 2017 and plateauing at this percentage for the following two years. Starting from 2020, information about the sourcing of captured animals was scarcer (i.e. not always reported), which translated into a reduction of recorded incidents.

744

minimum number of tigers confiscated from suspected or confirmed captive sources

FIGURE 21

Share of seizure incidents capturing whole tigers from confirmed and suspected captive sources.

Note: These are largely reported in the seizure incident report or inferred when live individuals, cubs or foetuses were captured in countries with small or no breeding populations and /or significant captive facilities.

One of the tigers rescued in the Thai zoo seizure in 2020

One of the cubs rescued from Nghe An, Viet Nam in August 2021

Thailand and Viet Nam stand out, with over half of the seizure incidents in the two countries from January 2000 to June 2022 estimated to have involved captive-sourced tigers (respectively amounting to 81% and 67% of the total number of tigers seized in the countries) (**Figure 22**). This trend became more prominent since 2010 in Thailand and 2016 in Viet Nam. Trade in captive-held tigers is a complex matter and remains a significant problem in the global battle to halt tiger trafficking. Over the years, CITES Tiger Missions[13] have identified the challenges and opportunities to resolve it, yet no meaningful outcomes have so far been achieved. The difficulties in proving lineage and ambiguity surrounding the origin of tiger parts found in the markets, including those from captive sources cannot be ignored. With evidence of tiger seizure incidents from such facilities, it is reasonable to estimate that a proportion of tiger products available to the consumer market originated from such sources.
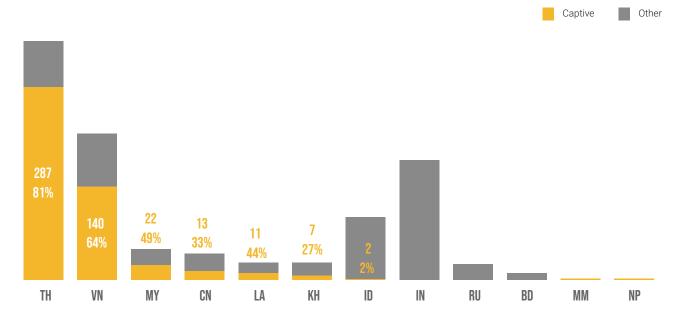

Thailand and Viet Nam stand out in suspected tiger captive sources

FIGURE 22

Number and share of whole tiger individuals confiscated in TRCs from confirmed and suspected captive origin from January 2000 to June 2022

TH: Thailand, VN: Viet Nam, MY: Malaysia, CN: China, LA: Lao PDR, KH: Cambodia, ID: Indonesia, IN: India, RU: Russia, BD: Bangladesh, MM: Myanmar and NP: Nepal

---

13 CITES Decisions 17.229 and 18.108 directed the Secretariat to undertake missions to TRCs with captive tiger facilities of concern, but the missions have not yet happened, in part due to COVID-19 travel restrictions
(See CITES CoP19 Doc.68: https://cites.org/sites/default/files/documents/E-CoP19-68.pdf)

PROSECUTION

Globally, at least 2,313 people were arrested in relation to tiger trafficking across 914 incidents for which this information was available (41% of the total). Some 95% of these arrests were in TRCs, involving 2,203 people across 795 incidents. A cursory assessment of this dataset indicates that between January 2000 and June 2022 at least 1,256 people were charged with an offence, 328 received a fine and 387 were jailed. Most seizure incidents, arrests and convictions were reported in India, China and Indonesia (**Figure 23**).
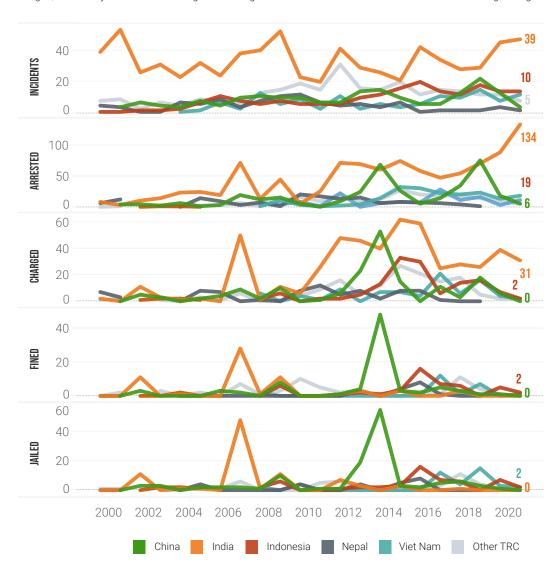
95%
of arrests
were in TRCs

Seizure incidents where information was available on individuals arrested, charged, fined and/or jailed in relation to tiger trafficking in TRCs between January 2000 and June 2022. Each dimension shall be considered independently and not related to or be considered a subset of the others due to partial data availability about prosecution statuses.

		INCIDENTS	ARRESTED	CHARGED	FINED	JAILED
	India	295	1,043	532	62	87
	China	114	374	174	85	122
	Indonesia	122	227	147	51	59
	Viet Nam	76	152	92	23	42
	Nepal	60	172	78	16	25
	Malaysia	37	55	40	29	12
	Russia	29	56	28	14	15
	Bangladesh	23	52	43	4	6
	Thailand	25	45	16	2	2
	Cambodia	7	12	15	2	3
	Lao PDR	2	4	4	0	0
	Bhutan	4	5	5	2	2
	Myanmar	3	7	5	2	0
	Non-Range	118	110	77	36	12
	GRAND TOTAL	**914**	**2,313**	**1,256**	**328**	**387**

Arrest and prosecution outcome information appeared to have become more openly accessible from 2011 onwards across most of Asia, particularly in the Asian tiger-range countries. In 2021, India reported an all-time high of 134 people arrested, considerably outpacing all other countries (**Figure 24**). China – having the second largest volume of reported prosecutions – recorded peaks in 2014 and again in 2017 respectively with 69 and 76 people arrested.

FIGURE 24

Trend in overall seizure incidents (including those for which prosecution data was not made available) and number of individuals arrested, charged, fined and jailed in relation to tiger trafficking between 2000-2021 in selected countries vs other tiger-range countries.

Legend: China | India | Indonesia | Nepal | Viet Nam | Other TRC

Jail sentences were recorded for 328 individuals convicted for trafficking in tiger products. Jail time ranged between one month and 19 years. Within tiger range countries, they ranged between 17 and 72 months (6 years) with a median of 36 months (3 years). Outside tiger range countries, the convictions were considerably fewer and with lower penalties, ranging between 6 and 25 months with a median of 11 months.

Fines issued by courts for trafficking in tigers ranged from less than USD12 to as much as USD390,000, with the middle half ranging between USD490 and USD5,200 and a median of USD1,700. Strong outliers in fines have a primarily symbolic value since they are often converted into jail time in lieu of those convicted not being able to pay the fine. This was the case of two Vietnamese traffickers sentenced to a hefty USD390,000 fine each in Malaysia in April 2019, which was converted into six additional months of jail time.

jail time ranged between one month and 19 years

PENALTIES IN RECENT YEARS (2018-2021)

Historically, jail penalties fell within a broad bracket, with very low minimum sentences. During the most recent four-year period (2018-2021), a compression of jail time within a narrower bracket was recorded, with half of the total convictions on record ranging between 24 and 60 months. Notably, the lower end of the interquartile range (middle half range) increased for the first time in years, almost tripling from the nine months of 2014-2017 to 24 months (**Figure 25**). While this change means higher minimum penalties across most sentences, a slightly lower median of 30 months was also recorded between 2018-2021, down from 39 months in the preceding period.
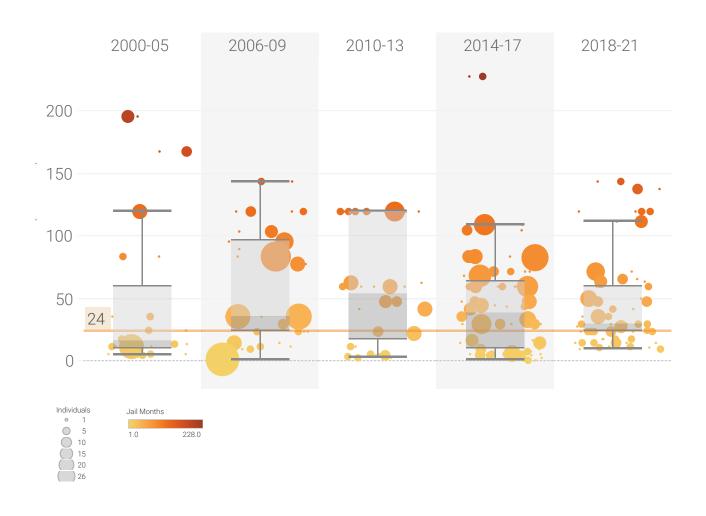
Between 2018-2021, half of the convictions involving fines ranged between USD690 and USD5,400, with a median of USD2,150. More comprehensive data on prosecution outcomes is needed to better understand sentences issued for tiger trafficking.

the median fine for tiger-related crime is USD2,150

FIGURE 25

Distribution of jail time sentences by length and number of individuals (size) over the years. The orange line identifies 24 months (2 years)

野生虎头皮。。。
Full set.....
欢迎大家来PM
See Translation

ONLINE TIGER TRADE IN SOUTHEAST ASIA

ANALYSIS REVEALED THAT OVER 313,000 FACEBOOK PROFILES WERE CLOSELY RELATED TO INDIVIDUALS OFFERING TIGER PARTS AND PRODUCTS FOR SALE ONLINE

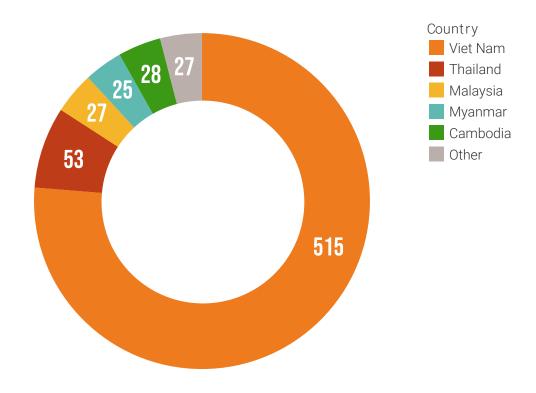*A screenshot of tiger's teeth being traded online*

From 2019-2021, TRAFFIC's active monitoring of online markets across six Southeast Asian TRCs (Cambodia, Lao PDR, Malaysia, Myanmar, Thailand and Viet Nam) enabled the identification of several Facebook accounts related to trafficking in tiger commodities. In total, 675 Facebook accounts selling tiger parts were identified, 76% of which were allegedly located in Viet Nam (**Figure 26**). This is a conservative minimum, noting that posts without sufficient information and with duplicate images were removed from recording and analysis.

FIGURE 26
Country distribution of Facebook social media profiles posting the sale of tiger parts. (In some circumstances, the country was inferred from the language used).

Country
- Viet Nam
- Thailand
- Malaysia
- Myanmar
- Cambodia
- Other

The profiles analysed were shared with Facebook and are no longer active at the time of writing. However, given the highly integrated network of traffickers, it is fair to assume those shut down may have returned to online operations using newly registered accounts unknown to TRAFFIC.

Analysis of this data revealed that over 313,000 Facebook profiles were closely related to individuals offering tiger parts and products for sale online. Through social network analysis, four central Facebook communities related to tiger trafficking were identified, the largest of which consisted of accounts reportedly located in Viet Nam (**Figure 27**).

Vietnamese traders emerged to be the most numerous (515), had the most direct acquaintances (larger circle size) and had the largest community of acquaintances (grey circles, in the social graph filtered to show only those with 5+ direct links to tiger traders). The three other communities included users from Thailand, Malaysia and Myanmar, which were smaller in the number of traders, had a more limited number of direct acquaintances and had considerably smaller communities. Cambodian and Indonesian accounts were also found, but these were tightly integrated within the Vietnamese community.
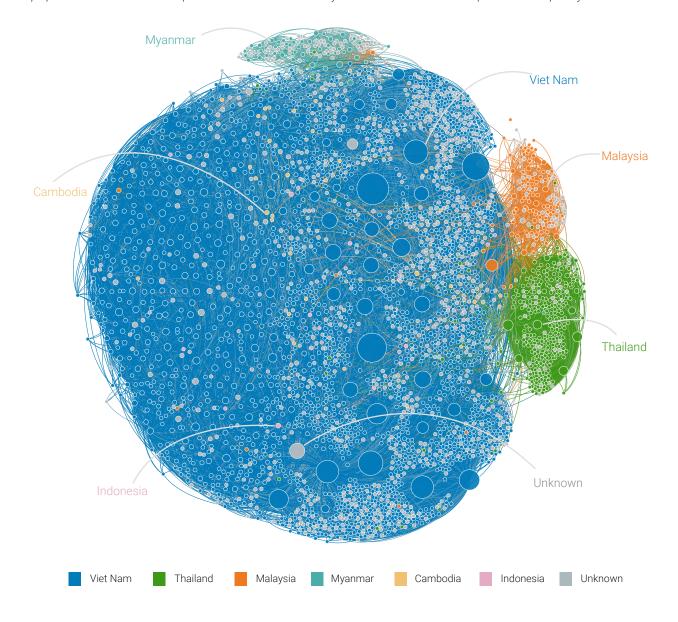
Vietnamese traders have the most direct acquaintances offering tiger parts and products online
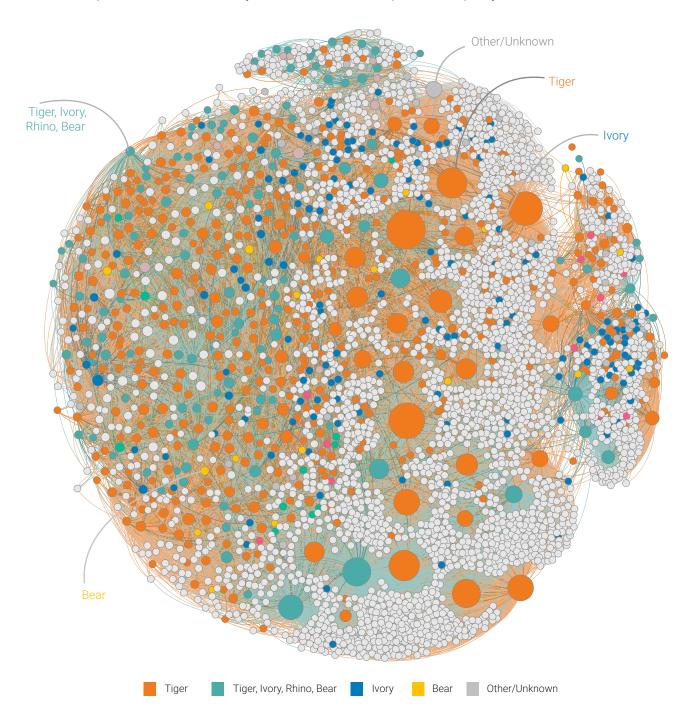
FIGURE 27
Social network graph of close acquaintances of individuals offering tiger products for sale online. Colour identifies the country's location. Size is proportional to the number of acquaintances of each account. Only accounts with five or more acquaintances are portrayed.

Legend: Viet Nam · Thailand · Malaysia · Myanmar · Cambodia · Indonesia · Unknown

All communities were closely integrated networks of accounts offering tiger products for sale (orange) (**Figure 28**), consistent with the expected output of the data collection, which focused on the tiger trade. A sizable number of accounts were found trading not only tiger products but at least one other wildlife commodity among elephant ivory, rhino horn and bear derivatives (teal). Closely interconnected were those specialised in elephant ivory (blue) and bear claws and teeth (yellow), possibly as an alternative to tigers. This analysis – leveraging upon big data – enabled the acquisition of a better understanding of the synergies between individuals dealing in different wildlife commodities online, a vast majority of which, if not all, are likely doing so illegally.

FIGURE 28

Social network graph of close acquaintances of tiger traffickers. Colour identifies the wildlife commodity trafficked. Size is proportional to the number of acquaintances of each account. Only accounts with five or more acquaintances are portrayed.

METHODOLOGY

SOURCES AND ACQUISITION

Dataset collected worldwide for this analysis covers the period of 1 January 2000-30 June 2022 with the analysis focusing on Asia and the Tiger Range Countries (TRCs). Most of the data was obtained from open sources (43%). Additional data was gathered from Government agencies (35%) and NGO partners (22%).

The governments of Bangladesh, Bhutan, India, Lao PDR, Malaysia, Myanmar, and Thailand have provided relevant data based on formal requests between 2010 and 2016 (Verheij *et al.*, 2010, Stoner and Pervushina, 2013; Stoner and Krishnasamy, 2016; Wong and Krishnasamy, 2019) with additional information gathered for the 2016 - 2021 period. Where possible, this was confirmed with the relevant government regarding details of seizures. Data was also received following authorisation from government agencies which submit their seizure data to the EU-TWIX database (Trade in Wildlife Information eXchange).

Key components of the data considered for the analysis were the locations, the quantity, the sources of tigers seized (wild sources or captive-bred), and the outcomes (law enforcement arrests and prosecutions). Due to the different reporting standards of the media and government agencies, data obtained were often varied with regard to the details of the information. This resulted in incomplete information (an example of missing detailed outcomes of prosecution) leading to significant limitations in the analysis.

Additionally, data on law enforcement outside of the TRCs was also collected opportunistically to obtain an overall view of the tiger protection status worldwide.

PRE-PROCESSING

Prior to the analysis, all data obtained were subjected to a thorough verification process including verification with local partners and government agencies to ensure maximum accuracy, especially with regards to information related to the time, locations, quantity, and type of commodity as well as the type and penalty given for each incident.

LOCATIONS

Geographical information consisting of latitude and longitude points were averaged to the first decimal unit in this analysis. This approach was taken to manage variation of recorded GIS locations that are in close proximity with each other (e.g. districts or a city). Therefore, datapoints generated from the analysis are approximately within a 16 km radius from the original locations. When the location information available is limited to the provincial level, the data point is displayed at the geographical centre point of the province. Particular attention however has been taken to minimise the approximation of geographical locations to ensure maximum accuracy in the analysis.

Throughout this report, China is represented inclusive of all its territories.

TIGER COUNTS

Tiger commodities usually come in a variety of forms making it complex to estimate the number of individual tigers involved. A standardised calculation based on the different commodity types was applied for this analysis to overcome this variation and calculate the minimum number of tigers seized (n) as precisely as possible. This approach is consistent with the one used for the 2019 iteration of Skin & Bones (Wong and Krishnasamy, 2019).

TABLE 2
Standardised calculation method to estimate the number of individual tiger (n)

COMMODITY TYPE	CONFIDENCE	CALCULATION	NOTES
Live, Carcass, Whole skin, Head, Skeleton, Skull, Tail, Genitalia, Gallbladder	High	$n = x$	Unique parts
Claw	High	$n = x/18$	One tiger has 18 claws
Tiger liquor (juvenile)	High	$n = x$	Whole cubs
Paw	High	$n = x/4$	One tiger has 4 paws
Teeth	Low	$n_{min} = x/4$ $n_{max} = x/30$	One tiger has 30 teeth and 4 canines. When traded alone, teeth are most likely canines.
Bone (items)	Low	$n = x/432$	One tiger has 432 bones
Bone (weight)	Low	$n = x/10$	One adult tiger has 10-15 Kg of bones
Meat (weight)	Low	$n = m$ (adult) $n = m/2$ (juvenile) $m = x/200$ (male) $m = x/117.5$ (female) $m = x/159$ (unknown)	The estimate is based on 45% meat yield on average body weight: Male 200 kg, Female 117.5 kg, Unknown 159 kg. Juveniles are estimated to weigh half of adults.
Tiger liquor (adult)	Low	$n = x/8$	Leg bones are usually used for spirits. One tiger has 8 leg bones.
Skin (pieces)	Low	$n = x/6$ (adult) $n = x/3$ (juvenile)	Estimated value allowing enough surface to be worked into medium-sized products.
Whiskers, other derivatives and body part	Low	$n = 1$	
Unspecified	Low	$n = 1$	

CONFIDENCE LEVELS

To minimise assumption-induced overestimation errors, we have identified two groups of commodities yielding either High or Low Confidence estimates. For each seizure incident involving multiple commodities, only the estimate originating from High Confidence commodities was used — High Confidence is attributed when the number of tigers involved is certain or reliably accurate (e.g. 1 skull = 1 tiger) — and the Low Confidence estimate discarded when comparatively lower.

In case Low Confidence items were always computed against the average, the resulting estimate would have lost accuracy and potentially resulted in either over or under-estimates. For example, a seizure of 5 skulls and 10 bones would result in an estimate of 2.5 tigers [n = (5+0.023)/2] using a computed average that considered both High Confidence (skull) and Low Confidence (bones) values. This would result in a severe underestimate. In this analysis, a seizure of 5 skulls and 10 bones results in an exact estimate of 5 tigers, because the Low Confidence value (bones) is discarded from the calculation. 10 bones represent an estimated 2.3% of one tiger, and while they do not add any significant detail (likely belonging to the same tigers as the skulls), they would introduce a significant error in an average estimate if taken into account.

This approach enables more accurate estimates by prioritising reliable sources and has considerably reduced the error margin in this analysis since the vast majority of seizure incidents involved at least one High Confidence commodity type.

LOW CONFIDENCE COMMODITIES

Among Low Confidence commodities, a special mention is needed for Teeth and Meat, for which assumptions were made.

Teeth: Each Tiger has 30 teeth; however, canines (n=4) are typically the most sought-after commodity due to their use as pendants. For the purpose of this analysis, we consider that teeth are canines when traded alone, mostly downstream in the trade chain. Seizures occurring near tiger habitats often feature complete body-sets, which would lead to an inaccurate Teeth-based estimate (30/4=7.5 tigers). However, because Teeth is considered a Low Confidence commodity, in the case of one complete body-set the misleading Teeth estimate is discarded in favour of concurrent High Confidence commodity types (e.g. skull, tail, etc.). This approach ensures that one complete body-set is always counted as 1 Tiger, and at the same time enables a more accurate estimate when only Tiger teeth are seized.

Meat: The total weight of an adult tiger spans 90–310 kg (males), 65–170 kg (females). We assume a 45% edible meat yield from tigers [min (avg. female) 35 kg – max (avg. male) 71 kg], a bit higher than cows (ca. 40%) due to the relatively higher ratio of muscular tissue in the wild tigers. This commodity type is considered Low Confidence due to the wide range coupled with the absence in most cases of cues on the sex and size of the animal and unreported variables such as the presence of bones or the hydration level of the meat.

SINGLE-CASE MAXIMUM ESTIMATE

When multiple types of High Confidence commodities were collected at the same time, only the commodity yielding the largest number of tigers possibly involved is considered. Such a single case maximum estimate approach is effective in avoiding underestimates when a fraction of several parts of potentially multiple tiger individuals are captured in a single seizure incident.

TABLE 3

Explanatory examples for the Single-Case Maximum Estimate approach

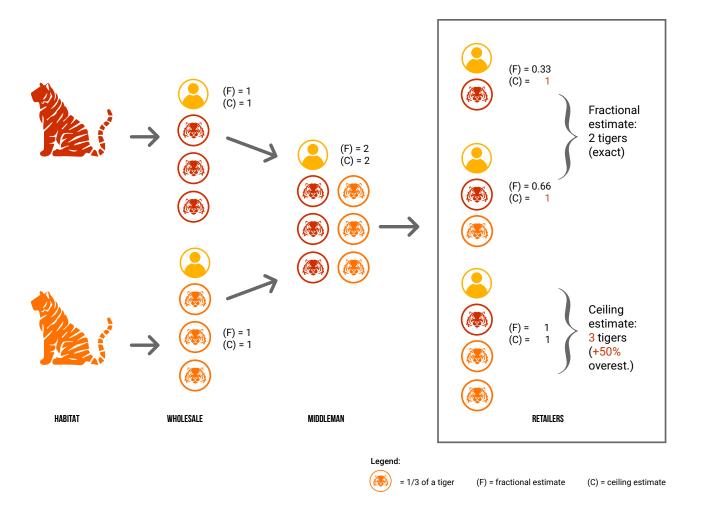| EXAMPLE	ITEMS SEIZED	FRACTIONAL ESTIMATE OF NUMBER OF TIGERS	SINGLE CASE MAXIMUM ESTIMATE	RATIONALE
Seizure 1	Skulls = 3 Claws = 74	from Skulls = 3 from Claws = 4.1	4.1 (5 tigers)	One tiger has only 1 Skull and 18 Claws, therefore 74 Claws must belong to five tigers (74/18=4.1), not three.
Seizure 2	Skulls = 2 Teeth = 13	from Skulls = 2 from Teeth = 3.2	3.2 (4 tigers)	One tiger has only 1 Skull and 4 canine Teeth (valued for trade), therefore 13 canine Teeth must come from four tigers (13/4=3.2), not two.
Seizure 3	Genitalia = 3 Bones = 38 Kg	from Genitalia = 3 from Bones = 3.8	3.8 (4 tigers)	One adult tiger has 1 Genitalia and an average of 10kg of Bones, therefore at least four tigers (38/10=3.8), were involved, not three.

TRADE CHAIN DISTRIBUTION

Confidence in the number of tigers poached decreases proportionally as the trade chain moves from the poaching site downstream to the end consumer. Seized tiger commodities in proximity to a poaching site are likely to feature full sets (whole body, teeth, claws, etc.), which offer more reliable information on the number of tigers involved. However, after the commodities are mixed and distributed in fractions across middlemen and retailers, achieving a reliable estimate requires additional caution. The current analysis adopts a fractional estimate approach, which takes into consideration fractions of one tiger in the computation and ensures aggregate measures are truly conservative estimates. This approach innovates from analyses where a ceiling estimate approach is used, which considers whole numbers rounded up to the higher unit (ceiling) thus yielding to potential overestimates (**Figure 29**).

The current fractional estimate analysis takes into account trade chain distribution patterns in aggregated calculations, avoiding overestimates of as much as 50% above the real values in this example.

HABITAT   WHOLESALE   MIDDLEMAN   RETAILERS

(F) = 1
(C) = 1

(F) = 2
(C) = 2

(F) = 1
(C) = 1

(F) = 0.33
(C) = 1

(F) = 0.66
(C) = 1

Fractional estimate:
2 tigers (exact)

(F) = 1
(C) = 1

Ceiling estimate:
3 tigers (+50% overest.)

Legend:

= 1/3 of a tiger   (F) = fractional estimate   (C) = ceiling estimate

DATA QUALITY AND LIMITATIONS

For the purpose of this analysis, the data reported by our sources was assumed to be correct and refer to genuine tiger parts. Given the inconsistent way incidents were recorded and reported by various sources, the data we have available may not represent the complete number of incidents that occurred.

Due to the inherently covert nature of the illegal trade in tigers, its true extent is unlikely to be reflected by the reported seizure data alone. Seizure records are an indirect measure of trafficking levels, but the data is inherently influenced by a number of biases, including varying levels of law enforcement activity and its effectiveness, rate of wildlife crime per country, different reporting and recording practices of both law enforcement and media, varying levels of corruption, etc.

Therefore, an increase in seizures in one country may not necessarily imply higher wildlife trafficking levels in comparison to other countries, though it is indicative of the scale of the trafficking or law enforcement effort taking place within that specific country.

REFERENCES

CITES (2022). Big Cats Task Force (Felidae spp.) Report of the Secretariat. Species Specific Matters. SC74 Doc. 69 (Rev. 1).

CITES (2022). Big Cats Task Force (Felidae spp.) Report of the Secretariat. General Compliance and Enforcement. SC74 Doc. 36.

EIA (2020). On The Butcher's Block: The Mekong Tiger Trade Trail. https://eia-international.org/wp-content/uploads/On-the-Butchers-Block-Tigers-Mekong-Report-2020-SCREEN-SINGLE-PAGES.pdf

Goodrich, J., Lynam, A., Miquelle, D., Wibisono, H., Kawanishi, K., Pattanavibool, A., Htun, S., Tempa, T., Karki, J., Jhala, Y. and Karanth, U. (2015). Panthera tigris. The IUCN Red List of Threatened Species 2015: e.T15955A50659951. http://dx.doi.org/10.2305/IUCN.UK.20152.RLTS.T15955A50659951.en

IUCN (2022). Migratory monarch butterfly now Endangered - IUCN Red Lis. https://www.iucn.org/press-release/202207/migratory-monarch-butterfly-now-endangered-iucn-red-list

Panthera (2022). *Global Tiger Population is Stable and Potentially Increasing Despite Extreme Threats, According to New IUCN Assessment Led by Panthera*. 21 July. Press Release. Panthera. https://panthera.org/newsroom/global-tiger-population-stable-and-potentially-increasing-despite-extreme-threats

Ten, D.C.Y.; Jani, R.; Hashim, N.H.; Saaban, S.; Abu Hashim, A.K.; Abdullah, M.T. Panthera tigris jacksoni Population Crash and Impending Extinction due to Environmental Perturbation and Human-Wildlife Conflict. Animals 2021, 11, 1032. https://doi.org/10.3390/ani11041032

Walston J, Robinson JG, Bennett EL, Breitenmoser U, da Fonseca GAB, Goodrich J, et al. (2010) Bringing the Tiger Back from the Brink—The Six Percent Solution. PLoS Biol 8(9): e1000485. https://doi.org/10.1371/journal.pbio.1000485

Wong, R. and Krishnasamy, K. (2019). Skin and Bones Unresolved: An Analysis of Tiger Seizures from 2000–2018. TRAFFIC, Southeast Asia Regional Office, Petaling Jaya, Selangor, Malaysia.

WWF (2016). Global wild tiger population status, April 2016: Background Document. Gland, Switzerland. http://tigers.panda.org/wp-content/uploads/Background-Document-Wild-Tiger-Status-2016.pdf

IMAGE CREDITS

2020 Thai zoo seizure that resulted in the rescue of five live tigers including this one

TRAFFIC

WORKING TO ENSURE THE TRADE IN WILD PLANTS AND ANIMALS IS NOT A THREAT TO THE CONSERVATION OF NATURE

TRAFFIC