GLOBAL TREND REPORT

MONITORING ONLINE ILLEGAL WILDLIFE TRADE

FOCUS ON THE MARITIME AND MARINE DIMENSIONS

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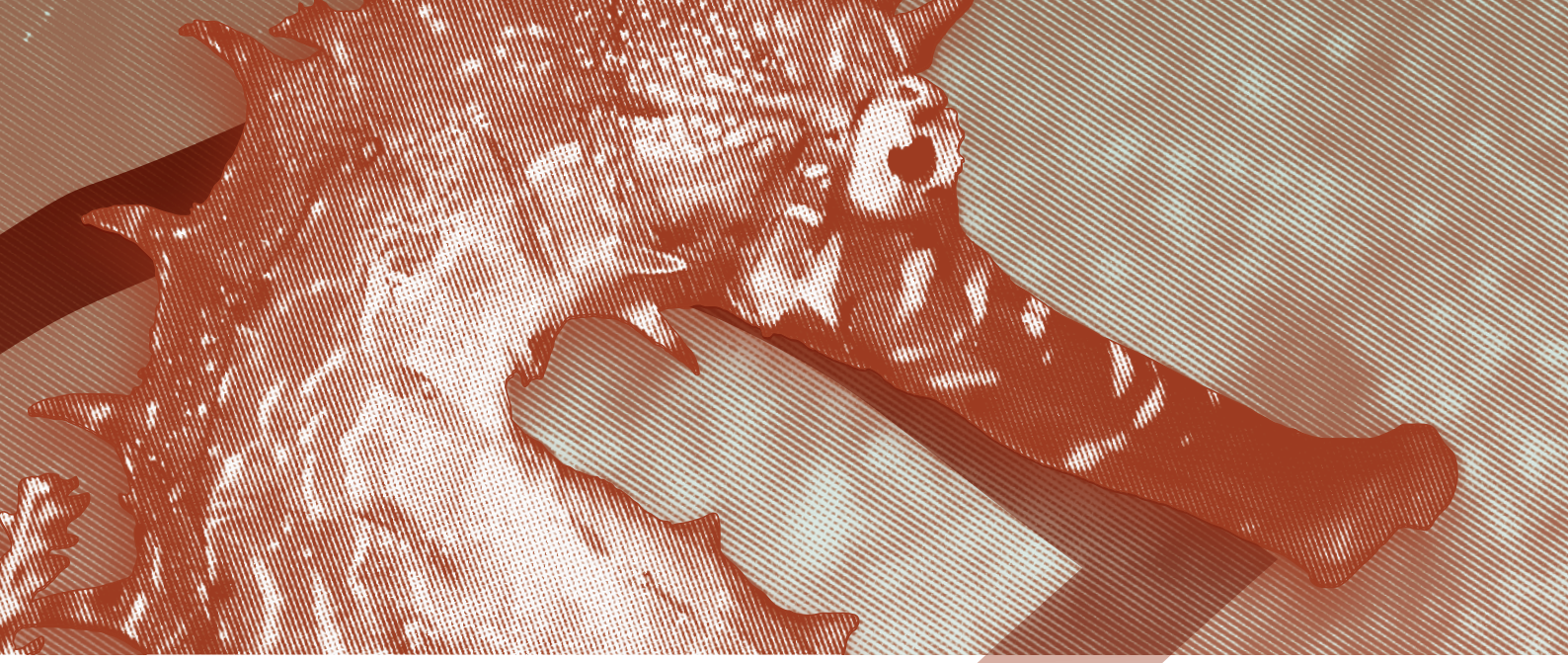
ACRONYMS AND ABBREVIATIONS

AIS	Automatic identification system
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
GMS	Global Monitoring System
IWT	Illegal wildlife trade



THE GLOBAL MONITORING SYSTEM FOR ONLINE MARKETING OF ILLEGAL WILDLIFE TRADE

The last decade and a half have seen an alarming surge in illegal wildlife trade (IWT) on the internet. However, a dearth of data regarding the scale of the market, its dynamics, operations and ramifications, especially on a global scale, is a significant hindrance to combating this crime. To address this, ECO-SOLVE has developed a Global Monitoring System (GMS) to systematically monitor global online IWT and gather data to feed into law enforcement activity and to inform policymaking. The GMS is a network of data hubs in countries whose domestic online markets are considered the largest or most consequential in their regions. National monitoring nodes are being set up in a staggered process and the size and scope of the network will grow with each edition of the Global Trend Report. This report draws on data from November 2024 to January 2025 from data hubs in Brazil, South Africa and Thailand. By identifying areas of high pressure on endangered species and ecosystems, monitoring may enable targeted interventions and inform law enforcement action to prosecute those responsible for wildlife crimes. Additionally, monitoring can help detect emerging trends and shifts in the trade, allowing for timely and effective responses to new threats and challenges.

This is the fourth publication in a series of Global Trend Reports that aim to showcase and contextualize trends in online IWT. Reports will be published throughout the three years of the ECO-SOLVE project, with two to four reports per year. Drawing on findings generated by the GMS, each Global Trend Report

DEFINING ONLINE ILLEGAL WILDLIFE TRADE

Online wildlife trafficking refers to the illegal trade in protected wildlife species and their derivatives facilitated through online platforms and digital means. It encompasses a wide range of activities, including the sale of live animals, exotic pets, animal parts and products derived from endangered species.[1]

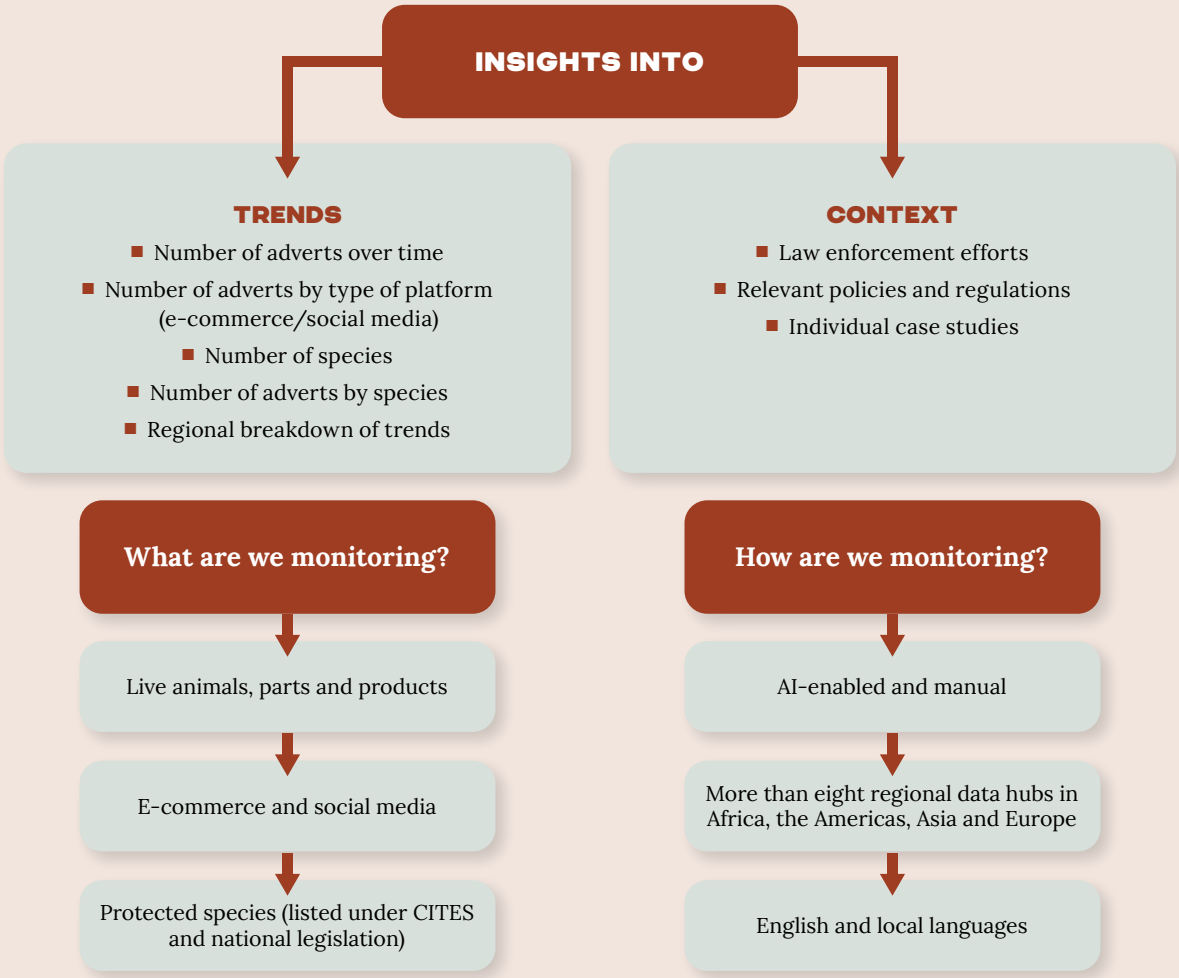


FIGURE 1 Global Trend Reports – expected insights and trends.

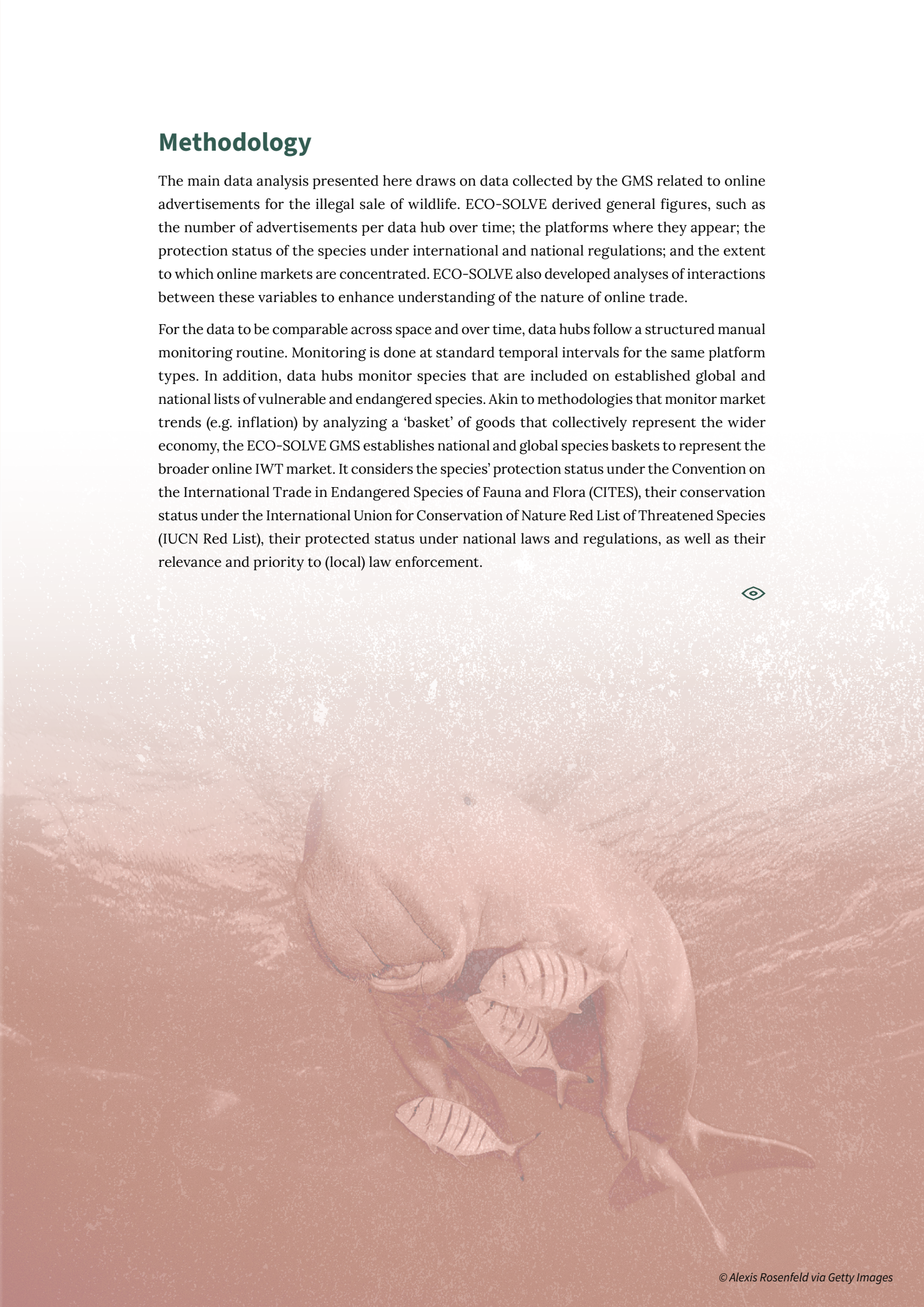
will highlight the latest trends in statistical data, including the number of advertisements found, the species advertised and the platforms that host these adverts. Diving deeper into individual topics, the reports will offer regional breakdowns and include sections that contextualize and analyze findings, while also investigating changes in regulations and their effects on online IWT as well as trends in law enforcement. The reports will also discuss case studies of online IWT.

Following the structure of the previous Global Trend Reports, the fourth issue begins with a trend analysis of online IWT drawing on data from regular monitoring carried out between November 2024 and January 2025 by GMS data hubs in Brazil, South Africa and Thailand. The report then dives into maritime and marine IWT, how technology can be leveraged to enhance counteractive measures, and the role of the GMS in strengthening maritime and marine IWT intelligence for law enforcement and other stakeholders.

Methodology

The main data analysis presented here draws on data collected by the GMS related to online advertisements for the illegal sale of wildlife. ECO-SOLVE derived general figures, such as the number of advertisements per data hub over time; the platforms where they appear; the protection status of the species under international and national regulations; and the extent to which online markets are concentrated. ECO-SOLVE also developed analyses of interactions between these variables to enhance understanding of the nature of online trade.

For the data to be comparable across space and over time, data hubs follow a structured manual monitoring routine. Monitoring is done at standard temporal intervals for the same platform types. In addition, data hubs monitor species that are included on established global and national lists of vulnerable and endangered species. Akin to methodologies that monitor market trends (e.g. inflation) by analyzing a 'basket' of goods that collectively represent the wider economy, the ECO-SOLVE GMS establishes national and global species baskets to represent the broader online IWT market. It considers the species' protection status under the Convention on the International Trade in Endangered Species of Fauna and Flora (CITES), their conservation status under the International Union for Conservation of Nature Red List of Threatened Species (IUCN Red List), their protected status under national laws and regulations, as well as their relevance and priority to (local) law enforcement.



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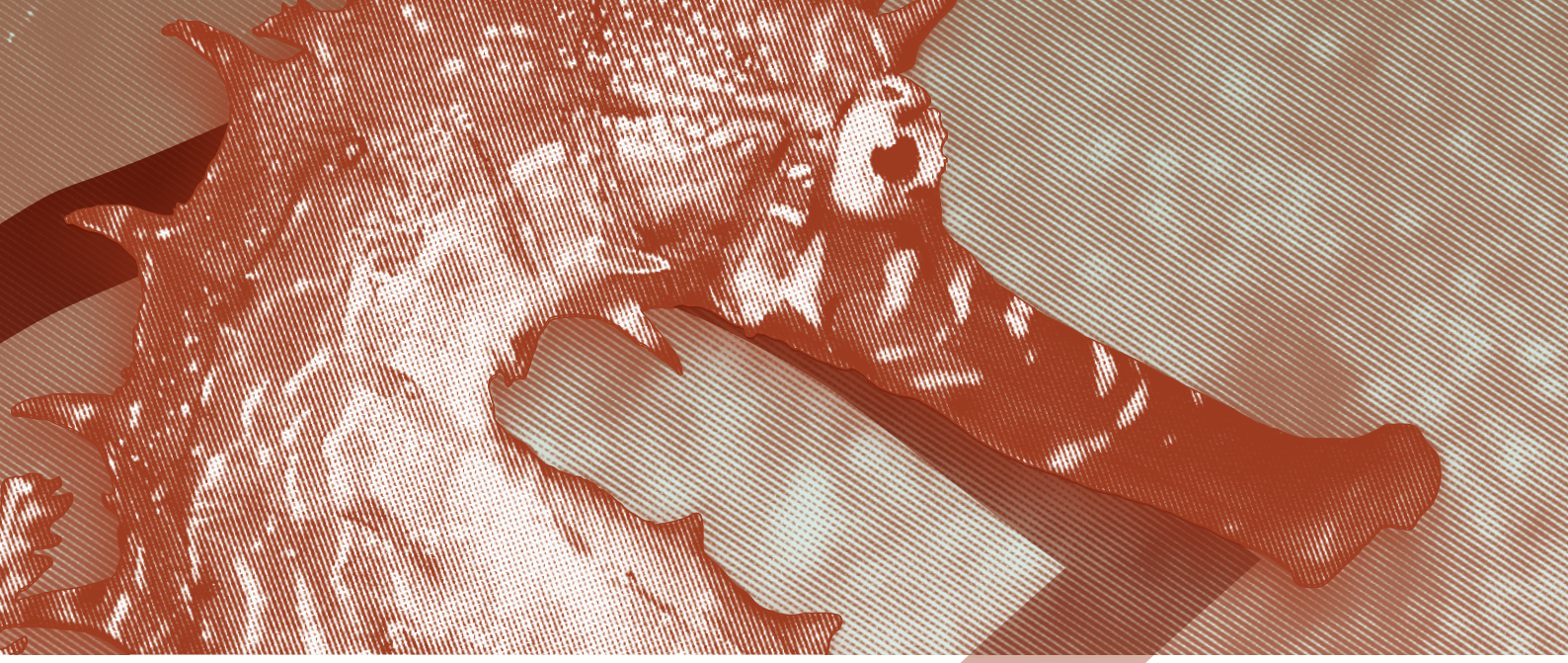


TRENDS IN ONLINE IWT MARKETS: GMS DATA NOVEMBER 2024–JANUARY 2025

The following analysis draws on GMS monitoring of the online IWT market over three months (November 2024–January 2025) in Brazil, South Africa and Thailand.

Across the three hubs, the GMS detected 3 192 advertisements for 40 target species. This represents an increase of 83% (1 451) from the 1 741 advertisements detected in the previous reporting period (August–October 2024). The Thailand hub, which began monitoring in September 2024, accounted for 77% (1 349) of those advertisements and this trend continues in the latest reporting period, with 80% (2 563) from Thailand, 11% (336) from Brazil and 9% (293) from South Africa. The Brazil, South Africa and Thailand hubs detected five, four and seven priority species respectively within their global and national species baskets.

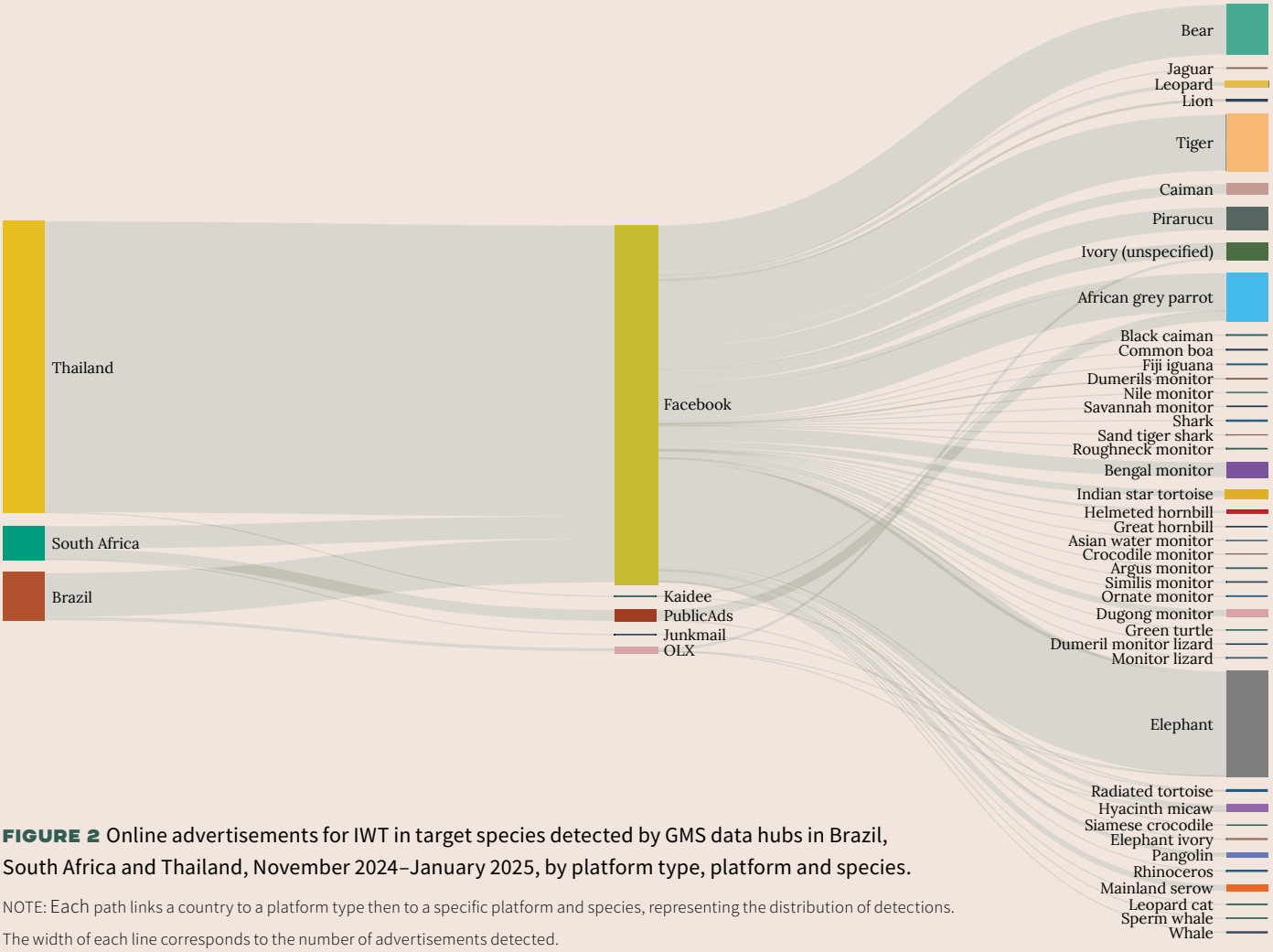


FIGURE 2 Online advertisements for IWT in target species detected by GMS data hubs in Brazil, South Africa and Thailand, November 2024–January 2025, by platform type, platform and species.

NOTE: Each path links a country to a platform type then to a specific platform and species, representing the distribution of detections. The width of each line corresponds to the number of advertisements detected.

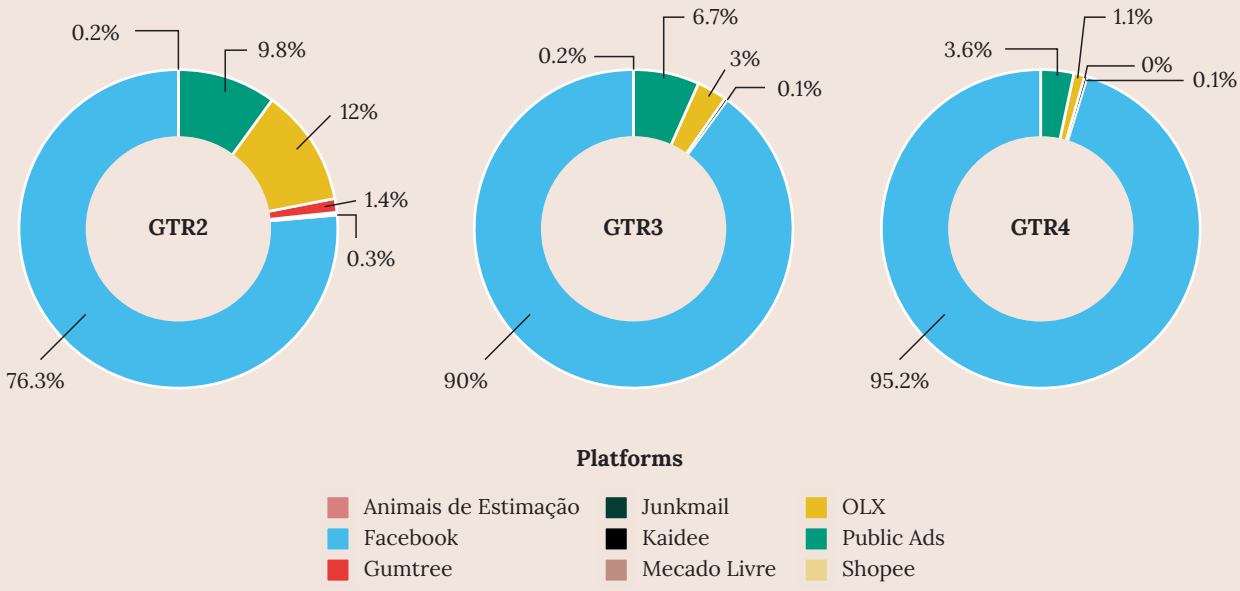


FIGURE 3 Percentage of IWT advertisements detected on social media and e-commerce platforms for Global Trend Reports 2, 3 and 4.

Facebook accounts for 95% (3 039) of the advertisements during the current reporting period, an increase from the previous reporting period when 91% (1 587) of detections were from Facebook.

Looking at the data from the longest-established monitoring hubs, Brazil and South Africa, there is a notable fluctuation over time in Facebook detections: from 78% (374) in May–July 2024 to 61% (238) in August–October 2024 and 76% (481) in November 2024–January 2025. The e-commerce platforms with the most detections remained OLX in Brazil (34) and Public Ads in South Africa (113). The South African hub detected more adverts on Facebook (179) than Public Ads (113). This is a shift from the previous reporting period, when there were more on Public Ads, and a return to the pattern observed in the second reporting period, possibly indicating a seasonal shift in the South African market. The Brazil data hub has seen consistently higher activity on Facebook than on e-commerce sites across all three reporting periods. A similar trend was observed by the Thailand hub in its two reporting periods.

In comparison to emerging data trends in the second and third reports, the most substantial growth in detections occurred in freshwater/marine species and birds in Brazil, mammals and birds in South Africa, and mammals in Thailand.

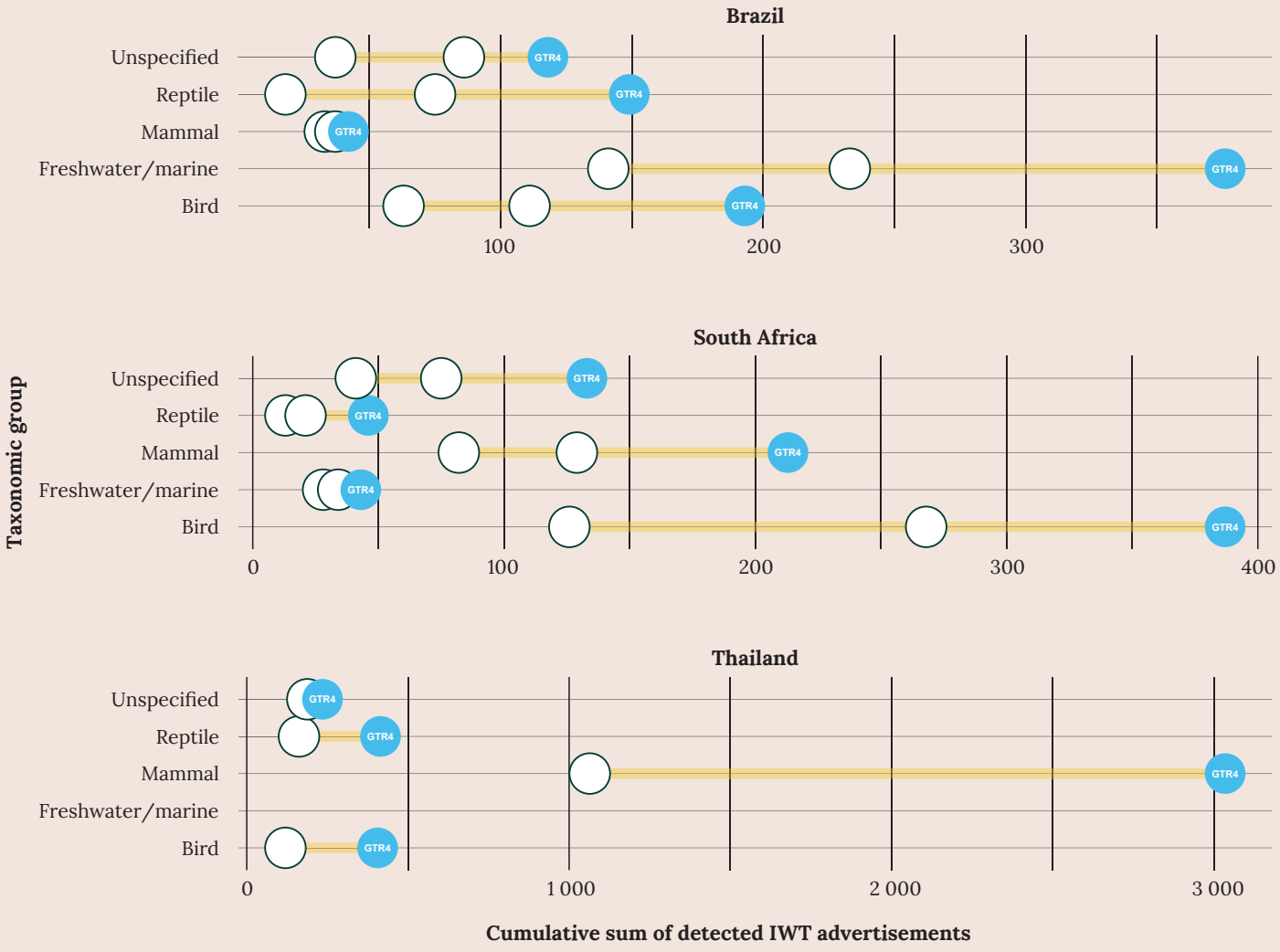
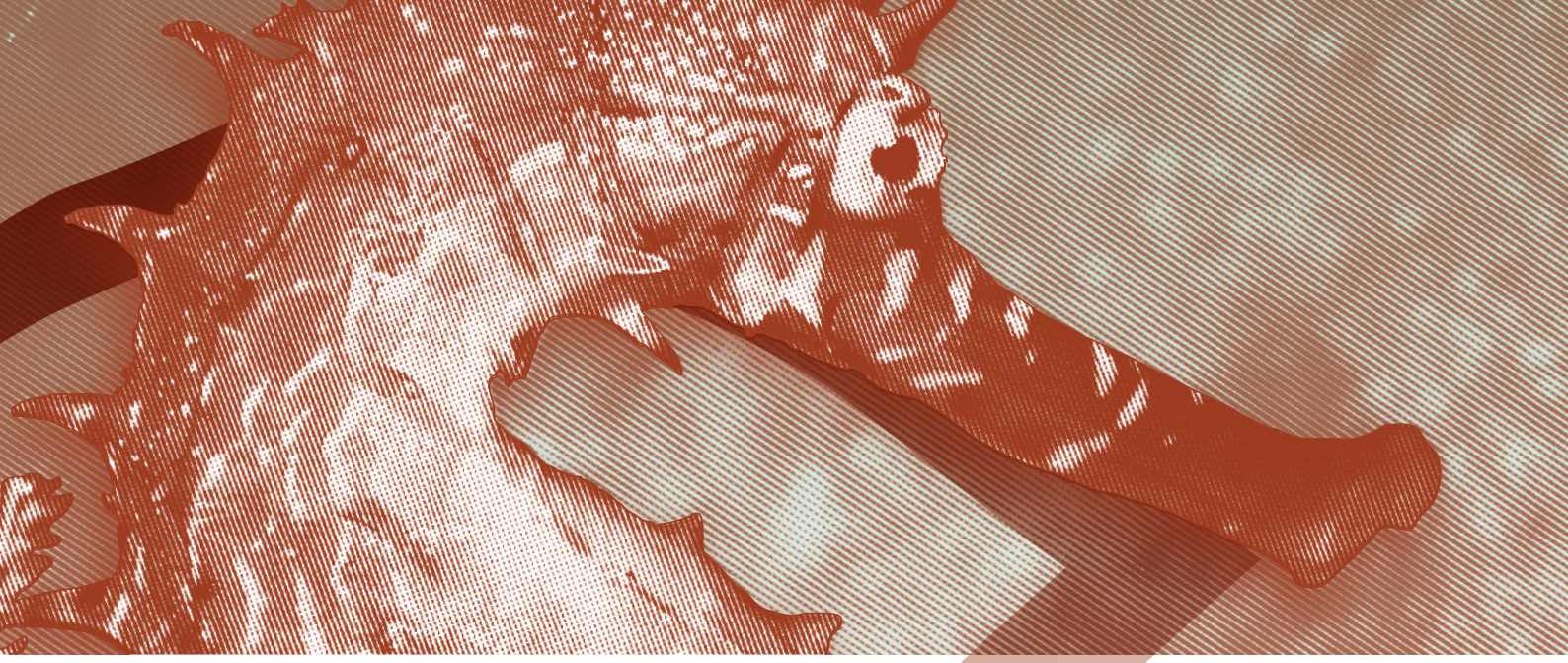


FIGURE 4 Changes to detections per taxonomic group across reporting periods.

Among the most frequently advertised species during the current monitoring period, elephants topped the list with 834 detections, reflecting active elephant part markets in Thailand and South Africa (there was only one detection in Brazil). The second- and third-highest detected species were tigers (494) and bears (460), which were detected only in Thailand. African grey parrots were the fourth-highest recorded species, with 411 detections and active markets in all three countries. Apart from elephants, African grey parrots were the only species observed in all three hubs during this reporting period, and all detections were of live parrots. The hyacinth macaw (Brazil and South Africa) and Indian star tortoise (Thailand) were the least detected species with 59 detections cumulatively. All Indian star tortoises were advertised as live. As observed in the last reporting period, South African hyacinth macaw sales were for live birds, but in Brazil the trade involved parts, reflecting the use of feathers in illegally marketed indigenous headdresses (known locally as *cocares*). With 34 detections from Thailand, pangolins were the least detected of the top 10 species in the last report. They are now in seventh place, with more than double the number of detections (84) but only one in South Africa.

KEY POINTS AND RECOMMENDATIONS

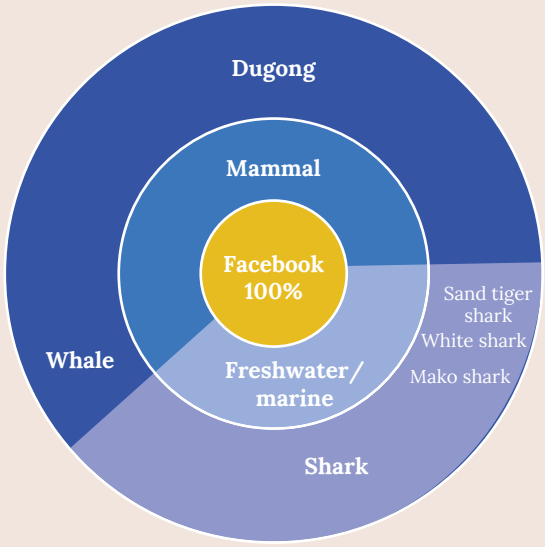
- Meta should implement stronger AI-powered or manual moderation to detect IWT content, paying particular attention to local languages. Facebook alone accounted for 95% of all wildlife trade detections, indicating the need for improved intervention at a platform level.
- National cybercrime and wildlife units in Thailand, Brazil and South Africa should consider launching targeted online enforcement operations against high-volume species and primary platforms identified during this monitoring period.
- CITES and IUCN authorities should use GMS data to update their trade threat assessments and prioritize species under international protection frameworks. They should alert relevant parties to emerging online trade hotspots (e.g. Thailand for tigers and bears) and request increased scrutiny of shipments and permits linked to these species. They should also formally request that parties, particularly Thailand, Brazil and South Africa, report specifically on online IWT enforcement efforts related to species with an increasing presence in illicit online trade.
- National environmental ministries should mandate reporting mechanisms and takedown protocols for e-commerce platforms where illegal wildlife advertisements have been found.
- Civil society and non-governmental organizations involved in wildlife conservation could use GMS trend reports to develop public awareness and demand reduction campaigns focused on the species and platforms most frequently involved in the trade.



THE RISING TIDE OF MARINE WILDLIFE TRAFFICKING

The trafficking of marine species has often been overlooked in broader discussions of wildlife trafficking and illegal fishing.[2] However, recent changes in their legal protection under CITES and national frameworks have brought the illegal trade in specific marine species into the spotlight. Marine IWT trends emerging from GMS monitoring, and the challenges of identifying trafficked marine species online, have highlighted systemic enforcement and policy weaknesses. In particular, the persistent issue of species identification – where products are sold as ambiguous 'marine' goods without labelling – has serious implications for enforcement. The GMS and other monitors are navigating these limitations, leading to policy recommendations such as mandatory species-level labelling in online marketplaces and tighter regulation of anonymous marine product listings.

The current reporting period saw relatively focused representation of marine species in the data hub national species baskets, including three shark species (white shark, sand tiger shark and mako shark) and whales in South Africa, hammerhead sharks in Brazil, and dugongs in Thailand, which yielded 135 detections of marine species in total.



Although nine platforms are systematically monitored among the data hubs, 100% of records of marine IWT were detected on Facebook

Dugong

68 detections from Thailand in the form of bones and teeth, marketed as "dugong/mermaid ivory"

Whale

16 detections from South Africa in the form of bones, teeth, and other parts

Shark

51 detections from Brazil (43) and, South Africa (16) marketed as parts of White sharks, Mako sharks, Sand tiger sharks, and others

FIGURE 5 Marine species detected on Facebook.

The challenges presented by the frequent sale of maritime species' body parts without clear species identification or labelling were raised in February 2025 at the Maritime IWT Conference in Singapore,[3] where key discussions highlighted species identification difficulties, fraudulent customs documentation and the prevalence of illegal trade concealed within legal markets.

Information on the widespread CITES listings of about 90% of sharks and rays during the 19th meeting of the Conference of the Parties to CITES in 2022[4] – and the accompanying trade bans on seahorses[5] – highlighted how underprepared many enforcement actors were for the scale and complexity of marine IWT. These changes revealed major gaps in existing monitoring systems and underscored the need for broader, more inclusive coverage and actionable intelligence.

As a result, GMS national baskets were expanded beyond specific species to encompass all potentially illegal online trade of shark, ray and seahorse products – formally incorporating seahorses (*Hippocampus* spp.) into the framework. At the same time, a reassessment of species groups warranting closer attention led to prioritization of three key taxa – sharks and rays, marine mammals and seahorses, based on their high trade volumes, conservation concern and frequent appearance in online markets.

Key species in marine trafficking

The term 'marine mammals' typically refers to cetaceans (e.g. whales, dolphins, porpoises) and pinnipeds (e.g. seals, sea lions, walruses). Marine mammal parts are used for food, oils, medicines and other purposes.[6] In 1986, a ban on commercial whaling was imposed by the International Whaling Commission, a global body working on the conservation and management of whaling.[7] Even so, commercial whaling continues in several countries that perceive it as part of their culture. Japan, Norway and Iceland are reported to have resumed commercial whaling and killed a considerable number of whales and dolphins.[8] In addition to the ban, whale species belonging to genera encompassing humpback whales (*Megaptera* spp.), sperm whales (*Physeter* spp.) and right whales (*Balaena* spp.) are included under Appendix I of CITES,[9] restricting their trade internationally.

In South East Asia, dugong parts such as bones and teeth are openly traded online and in physical markets, often carved into decorative items, despite their protection under CITES Appendix I.[10] Similarly, the bones of marine mammals, including pinnipeds, are often disguised as legal 'mermaid ivory' from extinct species such as Steller's sea cow.[11] DNA testing has revealed that these products also frequently originate from protected cetaceans, such as dolphins and whales, highlighting the need for systematic DNA analysis to trace and verify their origins.

Shark and ray fins are considered luxury delicacies in many Asian countries. While 'finning' practices (cutting off fins then returning sharks to the sea to die) are still common, various countries have set regulations to land all captured sharks in one piece.[12] Other shark parts, such as meat, liver, gill plates, oils and skins, are also processed for food and medicines.[13] It has been reported that the global trade in sharks and rays is worth about US$1 billion annually.[14] Population declines across shark and ray taxa are severe, with extinction risk increasing annually due to sustained overexploitation.[15]

Operation Thunderbird, an INTERPOL initiative, uncovered dried seahorses smuggled in snack boxes and destined for the Asian traditional medicine trade. *Photo: US Fish and Wildlife Service on Flickr*

Seahorses are an often-overlooked marine species that is frequently traded illegally. Despite all species being included under CITES Appendix II, seahorses are intensely traded internationally (usually in dried forms) as ingredients in traditional Chinese medicine.[16] In 2016 and 2017, Hong Kong, one of the main hubs for global trade, sourced 95% of its dried seahorses from countries with trade suspensions.[17] The conservation organization Project Seahorse is working to regulate the legal trade in seahorses, particularly using CITES measures and documenting trade of seahorses in e-commerce.[18]

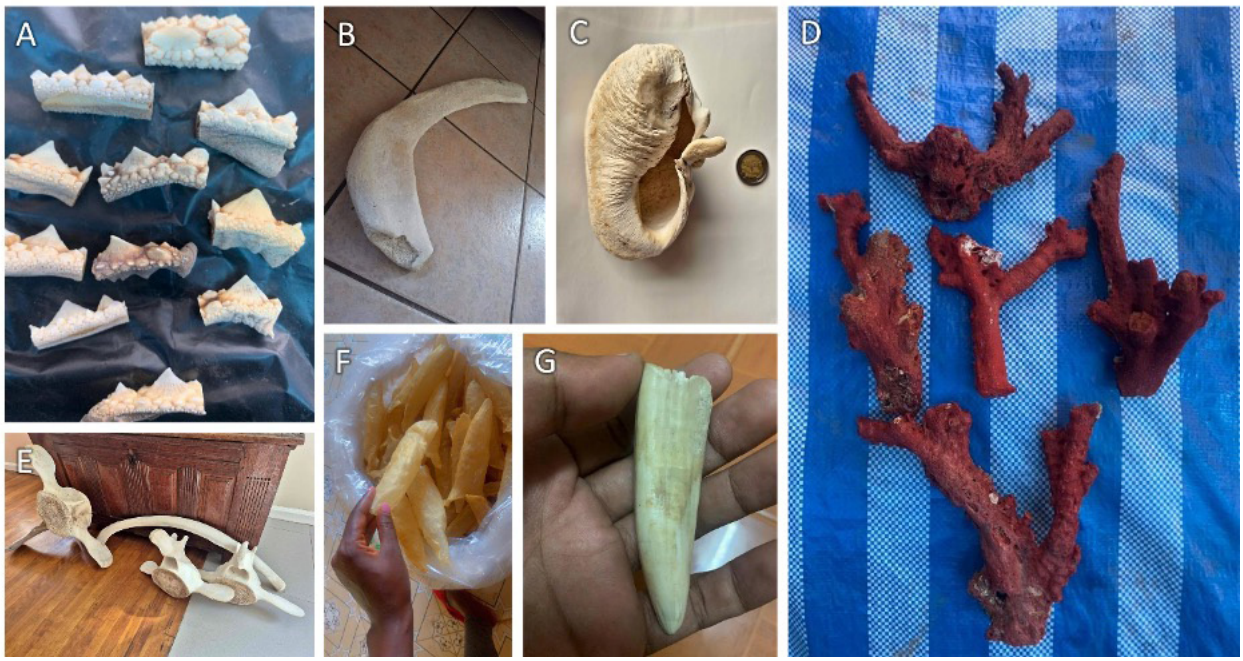
Challenges in monitoring the flow of marine wildlife

One of the foremost challenges in the regulation and enforcement of marine wildlife trade is the difficulty of species identification in the absence of individuals well trained in taxonomy or suitable identification resources. Species are often traded in ways that ensure a complete specimen with identifying features cannot be accessed,[19] making visual identification challenging at market stalls or through online advertisements.[20] Sharks and cetaceans are traded in forms that obscure their distinguishing characteristics, such as dried fins, oils, powders and processed bones. While DNA analysis can link powders, bones and meats to species, it cannot do so for oils.

Shark-derived oils are widely used in cosmetics, health supplements and traditional medicines. Once processed, these oils become chemically indistinguishable from other fish oils, making it difficult to determine whether they originate from protected species such as the whale shark (*Rhincodon typus*) or basking shark (*Cetorhinus maximus*), for example. Other fish products, including dried swim bladders, or maw, often lack adequate labelling and species misidentification is common in trade.[21] The global seafood industry's reliance on extensive supply chains further obscures the traceability of these products, complicating enforcement efforts against illegal trade.[22]

Cetacean bones, teeth and oils are used in a range of traditional crafts, luxury items and medicinal products. With sperm whales (*Physeter macrocephalus*) and various dolphin species subject to strict conservation measures, the ability to verify the source of these products is crucial. However, the challenge lies in distinguishing legally acquired bones from those obtained through illegal fishing.

The sale of illicit marine products is challenging to monitor through online advertisements for the same reasons. While some advertisements may specify the species a product or extract came from, others can be advertised with ambiguous labels such as 'fish maw'. Since these advertisements are entirely visual and limited to the images provided by the seller, species cannot be easily verified from the sale of marine wildlife derivatives.



Potentially illegal marine species products advertised online include parts described as A) bowmouth guitarfish thorns, B) whale rib, C) whale eardrum, D) sea fan, E) whale bones, F) fish maw, and G) dugong ivory. *Photos: Social media/ECO-SOLVE Global Monitoring System*

Marine IWT is becoming more concealed, complex and digitally enabled. Despite rising protections under CITES and national laws, law enforcement struggles to keep pace with the scale and sophistication of trafficking, especially as species are reduced to unrecognizable parts and mislabelled for trade. GMS data shows that key species such as sharks, whales, dugongs and seahorses are being trafficked with relative ease, often slipping through regulatory cracks due to lack of harmonized national legislation and international trade regulations. The path forward requires targeted, enforceable interventions grounded in traceability, technology and international coordination.

RECOMMENDATIONS

- Governments, customs authorities and fisheries and wildlife regulators should implement mandatory species traceability systems for high-risk marine products such as shark fins, fish maw, seahorses and sea cucumber, requiring origin and source labelling and digital traceability.
- National governments and CITES Management Authorities should introduce trade bans on unidentifiable processed marine wildlife, such as oils and powders, particularly those involving CITES-listed species, in order to prevent laundering and illegal trade through processed goods that evade species identification.

- Law enforcement agencies, market inspectors and platform moderators, in partnership with technology developers and conservation NGOs, should adopt and deploy AI-based species identification tools (e.g. FinFinder and iNaturalist) to detect illegal marine species in real time in physical markets and online platforms.
- National legislatures, environmental and wildlife ministries, and CITES focal points should prioritize the harmonization of national wildlife trade laws with CITES, aiming to close legislative gaps that allow illegal trade to persist due to inconsistent protection and enforcement standards.
- Governments, digital platform operators (e.g. e-commerce and social media companies) and international regulatory bodies should work together to establish stronger regulations and enforcement mechanisms for the online marine wildlife trade, including flagging ambiguous listings and automatically blocking prohibited items, as well as actively removing illegal content.

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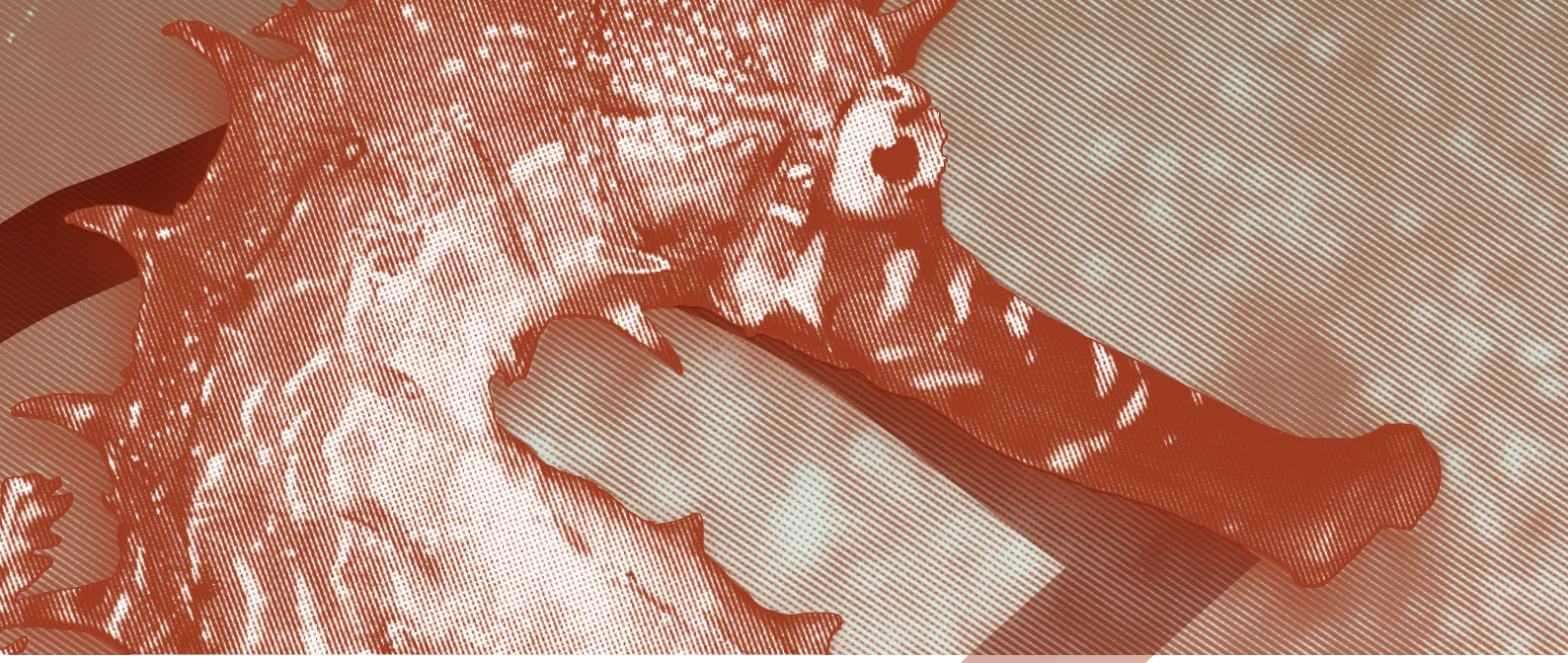


DARK WATERS: HOW THE SHIPPING INDUSTRY FUELS WILDLIFE CRIME

While many high-value wildlife products move by air or land, maritime trafficking remains a critical blind spot, especially for bulk shipments of ivory, pangolin scales and marine species, where detection is hampered by the scale of containerized trade and limited oversight at ports. Brazil, South Africa and Thailand, the countries with GI-TOC data hubs, have extensive coastlines, busy ports, and serve as key transit points in the maritime leg of global IWT. Despite growing awareness, law enforcement and policymakers face persistent challenges in monitoring these routes, including document fraud, concealment within legal shipments and corruption. But emerging technological solutions can enhance interdiction and strengthen control measures at seaports.

Seaports and the gaps in global enforcement

Shipping plays a crucial role in global trade, with an estimated 90% of the total volume of international goods transported by sea. The largest container ships can carry more than 24 000 containers, yet less than 2% of containers are inspected at entry and exit points, making shipping routes vulnerable to smuggling.[23] An estimated 72%–90% of illegally trafficked live animals, animal products, plants and timber is transported on maritime routes.[24]

Despite the scale of this issue, there is no industry-wide universal tool for cargo screening to identify illegal wildlife shipments.[25] Additionally, traffickers frequently use false names, fraudulent declarations and front companies to avoid detection, making it difficult for authorities to track and prosecute offenders.[26]

Research by the US National Marine Fisheries Service, University of California Santa Cruz and Global Fishing Watch has found that vessels' automatic identification system (AIS) transponders are frequently disabled near exclusive economic zones, particularly in contested regions or areas with rich fishing grounds and weak enforcement.[27] A similar study in 2024 reported that 75% of global fishing vessels are untraceable.[28] The illegal harvest of marine species is a key driver of commercialized marine IWT. A significant challenge in addressing large-scale illegal extraction is the presence of vessels operating without AIS – so-called 'dark vessels' – which complicates enforcement efforts. These vessels not only evade detection but may also rendezvous at sea with legally registered vessels to transfer illicit goods, further obscuring the trade.

Corruption also complicates enforcement efforts, with maritime operators and law enforcement officers at risk of being bribed or threatened to facilitate wildlife trafficking.[29] Traffickers exploit documentation loopholes by forging records or altering bills of lading to obscure shipment details.[30] There is also a general lack of awareness within the shipping supply chain about the seriousness of wildlife trafficking, its methods of infiltration, and the role the industry could play in either enabling or preventing this crime.[31] Many ports worldwide lack sufficient capacity to monitor and inspect the growing volume of ships and goods passing through each day, particularly regarding wildlife trafficking, which continues to evolve with sophisticated evasion techniques.[32]

Ambiguity and complexity related to maritime IWT

The global trade in wildlife presents significant regulation and enforcement challenges due to the inherent ambiguity and complexity of species identification. Often, wildlife products are processed before reaching consumer markets, presenting a major hurdle to trade regulation, as it may be difficult to identify the species, source and legality.[33]

Mislabelling products and documentation, a form of fraud, further complicates species identification and creates an additional layer of ambiguity. In some markets, particularly where demand for luxury goods or traditional medicines is high, species substitution is common. Ivory becomes 'timber' and pangolin scales become 'recycled waste' as paperwork rewrites reality. Traders may misrepresent endangered or protected species as legally sourced alternatives to conceal illegally caught marine species and bypass regulatory restrictions.[34]

This issue is particularly pronounced in online trade, where images and descriptions may not accurately reflect the product being sold. However, it also extends to wildlife sales using maritime transport systems that are often embedded in legal trade and occur through documentation. Traffickers fabricate export/import permits or use front companies to evade law enforcement. They may set up short-lived shell companies as the listed shippers or consignees to make the cargo seem legitimate.[35] In one Environmental Investigation Agency (EIA) investigation, a trafficker showed bills of lading listing a fake food import company in Laos as the consignee for containers carrying ivory and pangolin scales.[36] Additionally, traffickers with high-level networks even manipulate shipping routes on paper by switching bills of lading mid-transit to change the recorded origin of a container.[37]

METHOD	HOW IT HAPPENS	REAL-WORLD EXAMPLE	PREVENTION
Fake CITES permits or certificates	Forged export/import permits or certificates make illegal wildlife products appear legal.	Between 2007 and 2011, more than 100 chimpanzees and 10 gorillas were illegally exported from Guinea to China using falsified CITES permits.[38]	CITES National Management Authorities or the CITES Secretariat should verify, using systems or databases for cross-checking.
Misleading documentation (e.g. false origin statements)	False certificates of origin or misleading source country information disguise illegal products.	In 2017, 21 poison dart frogs from Brazil were seized in Miami with documentation falsely indicating European origin.[39]	National customs or government enforcement agencies should verify certificates and perform physical inspections of the products.
Declaring different species or goods	Listing CITES species as non-CITES, or disguising items (e.g. ivory as bone).	The Shuidong syndicate shipped 2.3 tonnes of ivory concealed as plastic pellets, with documents declaring the cargo as '960 bags of plastics'.[40]	Customs agencies should carry out inspections using X-rays, physical checks and DNA testing to detect discrepancies.
Substituting labels or fake signatures	Falsifying signatures or replacing labels to falsely indicate legal compliance.	In 2009, falsified CITES permits with counterfeit signatures were used to export Marco Polo sheep and Markhor trophies from Tajikistan to Russia.[41]	CITES authorities should cross-check signatures and confirm validity.
Tampering with shipment details	Altering species names, weights or quantities in shipment documents to avoid detection.	Traffickers alter shipment details, such as species names and quantities, to mislead authorities and facilitate illegal trade.[42]	Customs and border control units should inspect documents and physical goods; compare shipment data with customs records – though this is often time and resource intensive.

FIGURE 6 Common document fraud techniques used in maritime IWT, and corresponding prevention measures.

Traffickers rely on fraudulent documentation and misdeclaration to facilitate trafficking disguised as legal trade of other high-value items. Common misdeclarations have included labelling pangolin scale shipments as 'recycled waste', ivory as 'timber' and rhino horn as 'craft stone'.[43] These deceptive practices not only obscure the true nature of cargo but also allow illicit wildlife products to be seamlessly integrated into shipments of other goods such as timber, foods and agricultural commodities.

Cargo of crime: how wildlife is hidden in legitimate shipments

Ivory and pangolin scales are often concealed in timber shipments. Traffickers hollow out logs or stash tusks and scales among stacks of timber or furniture, then reseal or disguise the wood to appear normal. In one case, Vietnamese customs found almost 5 tonnes of ivory and 277 kilograms of pangolin scales hidden inside hollowed-out blocks of timber.[44]

Refrigerated shipping containers ostensibly packed with seafood or meat are used to mask wildlife products. The cold environment helps suppress odours, reducing the chance that sniffer dogs will detect pangolin scales or other animal parts. For example, one of the largest ivory seizures in Hong Kong found 7.2 tonnes of tusks hidden in a container falsely declared as frozen fish.[45]

Dense sacks of agricultural produce also provide cover for illegal wildlife. Traffickers mix wildlife products into shipments of dried beans, cashew nuts, ginger slices and other crops. In August 2015, Vietnamese customs seized 1 023 kilograms of ivory tusks and 4 tonnes of pangolin scales hidden among sacks of beans.[46]

A) Shark fins shipped in frozen cargo, B) Caviar packaged as cosmetic products, and C) A sniffer dog supporting a customs agent looking for mislabelled or illegal products within packaging. *Photos: US Fish and Wildlife Service/Flickr*

Some traffickers embed wildlife products inside other substances or create fake structures to hide them. Rhino horns and ivory have been sealed in wax or plaster to appear as innocent items. An investigation led by the EIA in Vietnam found that raw ivory tusks were still coated in wax, indicating smugglers had dipped them in wax to mask their smell or appearance during transit.[47] Traffickers also construct secret compartments in cargo to conceal high-value wildlife products.[48]

To combat the intertwined trafficking of wildlife and other goods, it is essential to understand how trafficking hotspots contribute to the persistence of illegal trade networks.

Major ports as conduits for trafficking: case studies from Asia, Africa and Latin America

Illegal wildlife trade through maritime ports is dynamic and geographically fluid. Traffickers routinely adapt to enforcement measures, shifting their operations to new ports when oversight intensifies. This displacement effect is particularly evident in parts of Africa, where improved interdiction at once-prominent ports has led to the emergence of new hubs with weaker governance and fewer controls. At the same time, ports near wildlife source regions often serve a limited number of specialized trafficking networks – especially those dealing in high-value goods such as ivory and rhino horn – whereas ports in or near consumer markets tend to receive a far broader spectrum of illicit wildlife products. The following case studies highlight how major ports in Africa, Asia and Latin America have been implicated in the global illegal wildlife trade, illustrating shifting trends, regional specializations and the global nature of the supply chain.

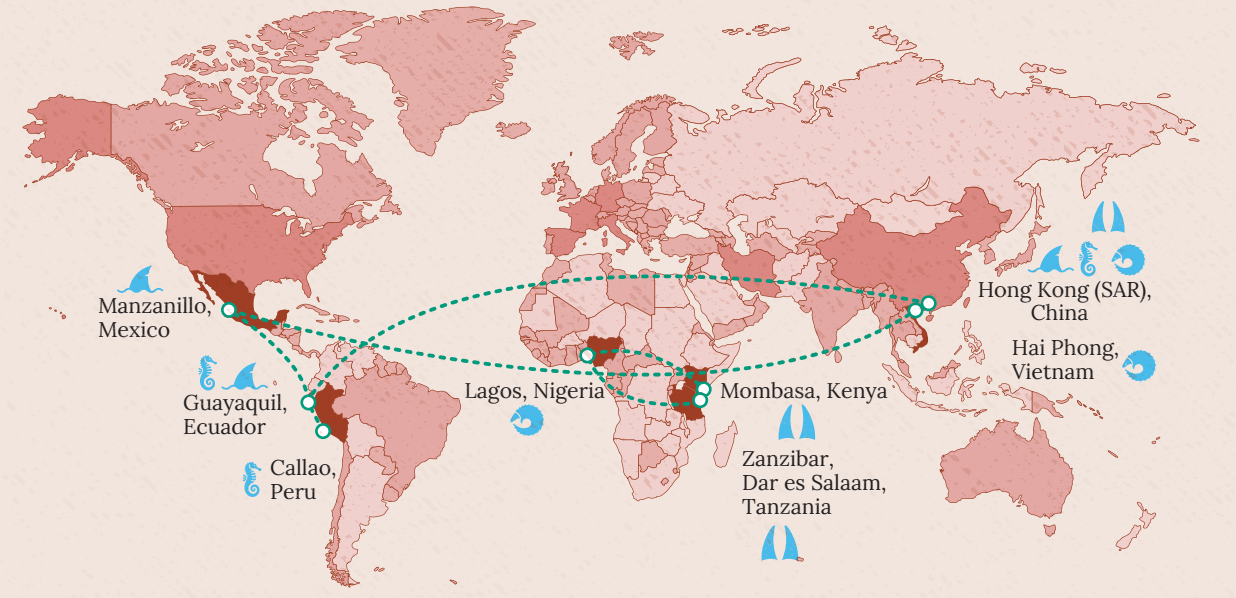


FIGURE 7 Major maritime port hubs referenced in the case studies.

In Africa, Mombasa in Kenya was a central hub for ivory trafficking between 2009 and 2014, with an estimated 18 tonnes of ivory seized – equivalent to tusks from about 2 400 elephants.[49] Its prominence stemmed from its high container traffic and vulnerability to corruption. Mombasa has declined in importance in recent years as traffickers increasingly shift operations to less-monitored ports in West Africa.[50]

The ports in Lagos have made the Nigerian city a global epicentre for pangolin scale exports and a major ivory conduit. The ports handle massive traffic and have been used to export illegal wildlife products from West and Central Africa due to corruption vulnerabilities.[51] Recent studies show that 94% of pangolin scales seized globally from 2016 to 2019 came from only six countries, with Nigeria at the top of the list.[52]

Tanzania's seaports, particularly Dar es Salaam and Zanzibar, also play a key role in trafficking. These ports, strategically located and historically under-regulated, have served as gateways connecting inland Africa to Asian markets. Reports have flagged East African ports as particularly susceptible to IWT due to their large trade volume and limited port controls.[53]

In Asia, Vietnam has consistently functioned as a destination and transit country for African-sourced wildlife products. From 2010 to 2021, more than 120 seizures involving ivory, pangolins and rhino horn were recorded at Vietnamese ports, with Hai Phong standing out as a particular hotspot for maritime trafficking.[54]

Hong Kong remains a critical node in the smuggling chain due to its proximity to China and its permissive trade environment (including a free port status that enables rapid import and export with weak inspection regulations, limited container screening and historically low penalties for wildlife trafficking). Traffickers exploit this by using Hong Kong as a transit point for shipments from Africa or to supply the local black market.[55] Between 2013 and 2017, Hong Kong authorities confiscated more than 20 tonnes of ivory, 43 tonnes of pangolin scales and carcasses, and other endangered species worth more than US$72 million in total.[56] In 2019, customs seized a record 26 tonnes of shark fins originating from Ecuador.[57]

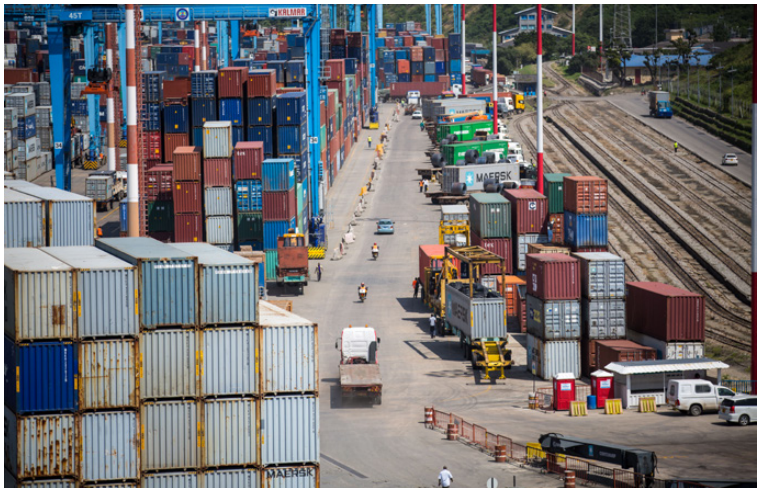
In Latin America, Pacific ports such as Guayaquil (Ecuador), Callao (Peru) and Manzanillo (Mexico) have been exploited to traffic marine wildlife, primarily to Asia. Ecuador is noted as one of the world's top exporters of shark fins, both legal and illicit.[58] Callao has been the scene of massive seahorse trafficking, and in 2018 Peruvian authorities seized 12.3 million dried seahorses weighing more than 5 tonnes on a ship bound for Asia. This case has been considered the largest seahorse seizure on record.[59] Each of these ports is an integral link in the maritime export of marine wildlife contraband from the Americas to global markets.

Leveraging technology for online monitoring

The complexity of monitoring IWT through major ports highlights the pressing need for innovative solutions. With traffickers constantly adapting their methods to evade detection, enforcement agencies must explore advanced techniques to identify and track illicit activities. A combination of vigilant monitoring, cutting-edge tools and international collaboration is required to address the evolving nature of maritime IWT issues.

AI-powered applications such as FinFinder and iNaturalist are emerging as significant aids to species identification efforts. FinFinder uses machine-learning algorithms to swiftly identify shark and ray species from fin images, facilitating the rapid detection of illegal shark fin shipments. Similarly, iNaturalist employs AI to assist users in identifying a wide array of species from photographs. The platform combines AI-driven image recognition with a large community of expert volunteers who validate records to ensure accuracy. These technologies play a crucial role in identifying a wider range of trafficked wildlife, including heavily traded yet often overlooked marine species.

AI and other advanced technologies have become a pivotal component in enhancing online IWT monitoring and open-source intelligence investigations. For instance, platforms such as MarineTraffic use real-time AIS data to track vessel movements globally, enabling analysts to scrutinize shipping routes associated with suspicious activities. By setting up monitoring parameters along these routes, tools such as Skylight can detect 'dark' vessels – those that disable their AIS to evade detection – by analyzing satellite imagery and vessel behaviours such as rendezvous at sea, indicating potential illicit trans-shipments. By combining AIS data with satellite/remote sensing analytics, open-source intelligence investigators can better identify shipping routes linked to online profiles selling marine wildlife.



High-volume container traffic and vulnerability to corruption characterize some major ports, such as Mombasa, Kenya.
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Policy, enforcement and future directions

Despite growing awareness of maritime IWT, current policies and enforcement strategies reveal significant gaps that hinder effective action due to terrestrial biases in protections and a global lack of governance and enforcement.[60] There is still an absence of harmonized international definitions of legality and robust, compatible regulatory frameworks related to marine and maritime IWT issues, leaving jurisdictions with fragmented legal instruments that traffickers can readily exploit.

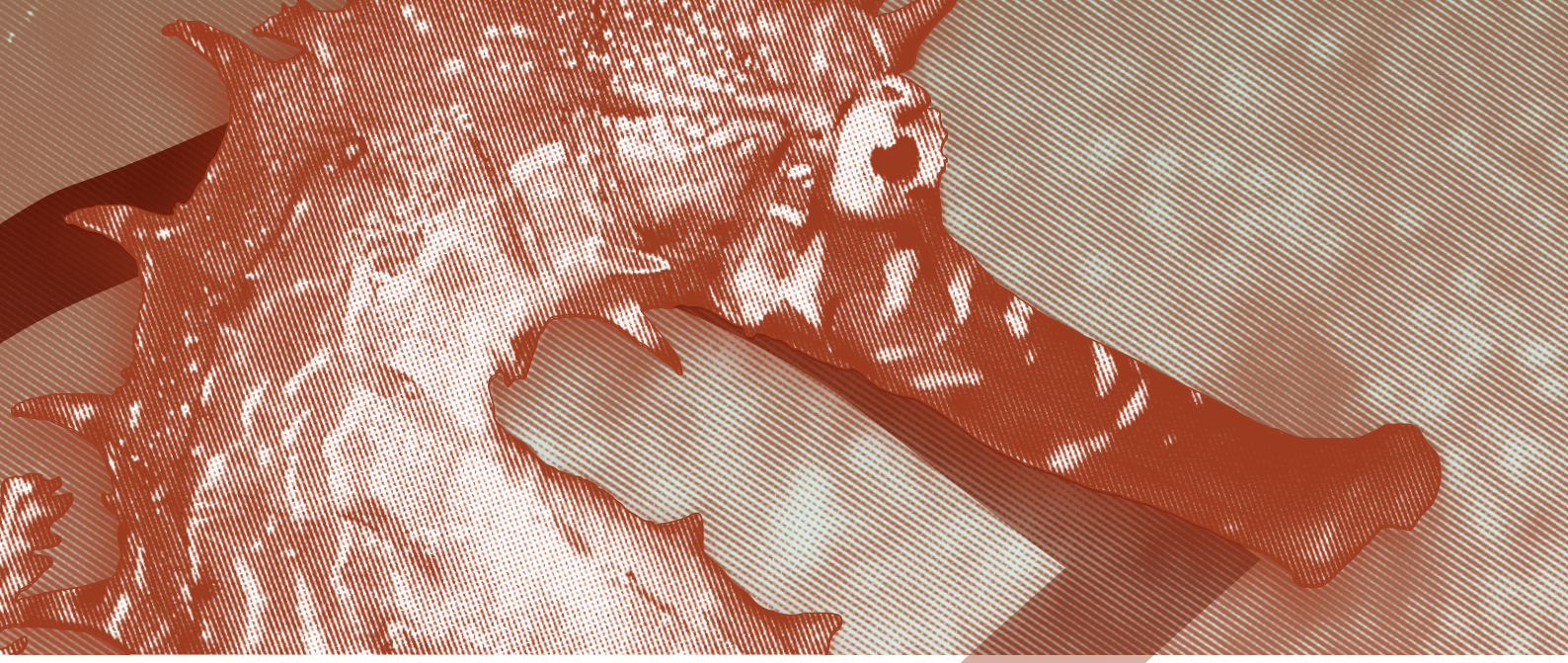
In-depth reports by organizations such as the Basel Institute on Governance have highlighted that legal loopholes and inconsistent national policies allow illicit operators to navigate around enforcement,[61] while scholarly research[62] points to the inherent difficulties of applying enforcement even with robust legislation due to the remote nature of marine IWT issues and overlap with commercial and leisure activities. Other studies note that IWT issues often fall between jurisdictions, complicating prosecution and cross-border cooperation, as legal mechanisms struggle to keep pace with traffickers' innovative methods.[63]

At the same time, emerging evidence from conservation studies indicates that the enforcement gap is exacerbated by limited resources and insufficient training of front-line personnel.[64] Enforcement agencies are frequently hampered by the sheer volume of global maritime trade and the inherent challenges in identifying trafficked marine products, which are often processed or mislabelled to obscure their origins. In this context, new technology-driven approaches are proving essential. Algorithm-based monitoring and advanced analytical tools offer crucial support in detecting suspicious patterns and tracking the movements of high-risk vessels. These innovations present an opportunity to strengthen enforcement, provided they are integrated within a cohesive international framework that encourages collaboration between government and non-governmental organizations and agencies.

Strengthening global cooperation is critical in the fight against marine and maritime wildlife trafficking. Coordinated efforts among law enforcement agencies, governmental bodies and conservation groups have the potential to bridge the policy gaps identified in current frameworks. Recommendations emerging from recent studies call for harmonized policies, increased funding for enforcement initiatives, and the establishment of standardized protocols. These would facilitate cross-border operations with modernized methods of permitting and record-keeping to ensure the legality of maritime products and market flows.[65] Such measures, combined with the adoption of cutting-edge technology, can create a more formidable barrier against traffickers and significantly improve the detection and prosecution of maritime IWT offences.

RECOMMENDATIONS

- CITES Secretariat and National Management Authorities should introduce new technologies such as blockchain or CITES e-permits to prevent forgery and allow real-time cross-border verification.
- National customs agencies and port authorities should use cargo profiling and AI to flag suspicious containers (for example, 'frozen fish' or 'timber' masking wildlife) for customs checks.
- Customs, border control agencies and port authorities need to integrate the use of surveillance technology offered by platforms such as Skylight or MarineTraffic to detect 'dark' vessels, unusual trans-shipments and trafficking corridors.
- Port authorities and wildlife enforcement networks should embed wildlife detection in maritime logistics by equipping major ports with sniffer dogs, DNA sampling kits and image-recognition technology for concealed goods inspections.
- Customs, coast guards, CITES Authorities, INTERPOL and national law enforcement need to create interagency (customs, coastguard, CITES, INTERPOL) maritime wildlife crime units permanently stationed at high-risk ports to handle wildlife crime cases.



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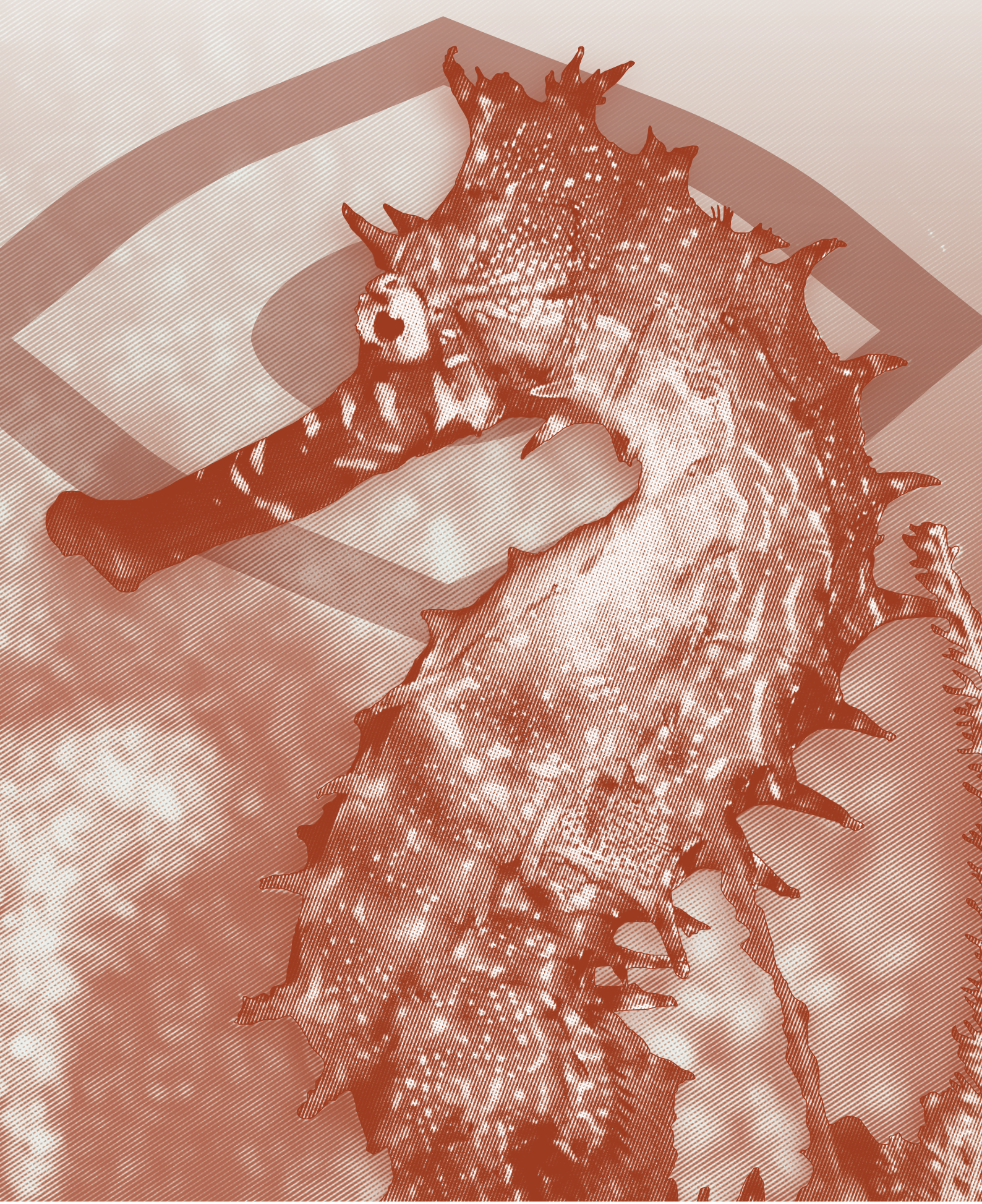

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