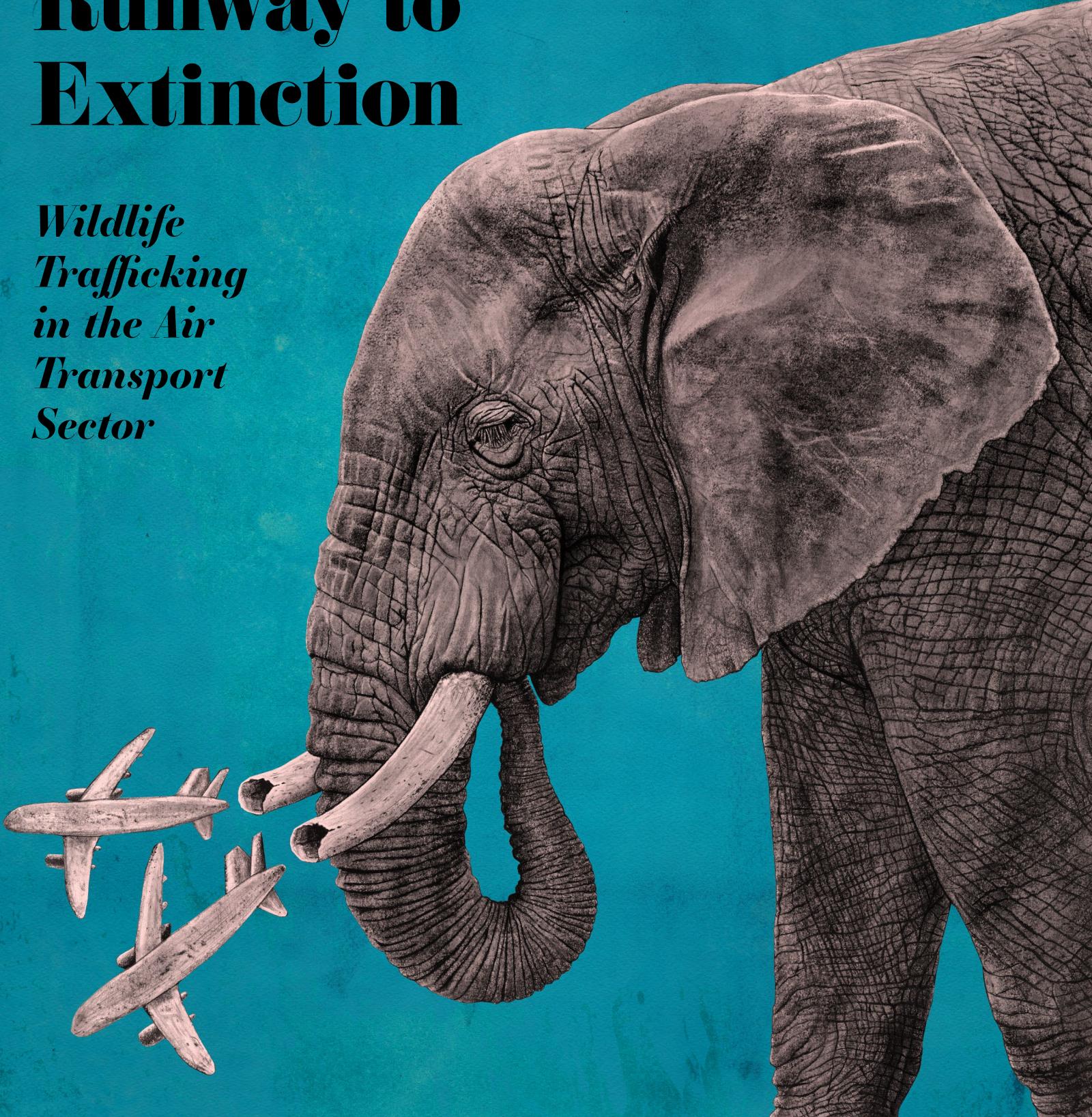


Runway to Extinction

*Wildlife
Trafficking
in the Air
Transport
Sector*



USAID
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C4ADS
innovation for peace



TRAFFIC
the wildlife trade monitoring network





The USAID Reducing Opportunities for Unlawful Transport of Endangered Species (ROUTEs) Partnership brings together transport and logistics companies, government agencies, development groups, law enforcement, conservation organizations, academia and donors to disrupt wildlife trafficking activities, and forms a key element of the concerted international response to addressing wildlife poaching and associated criminal activities worldwide.

At the heart of ROUTES is a core group of partners collaborating with the U.S. Government and the transport sector that includes the Airports Council International (ACI), Center for Advanced Defense Studies (C4ADS), Freeland, the International Air Transport Association (IATA), TRAFFIC and WWF.

For resources referenced in this document or for more information visit:

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The designations of geographical entities in this publication, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of C4ADS, ROUTES, or ROUTES partners concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

ABOUT C4ADS

C4ADS (www.c4ads.org) is a 501(c)(3) nonprofit organization dedicated to data-driven analysis and evidence-based reporting of conflict and security issues worldwide. We seek to alleviate the analytical burden carried by public sector institutions by applying manpower, depth, and rigor to questions of conflict and security.

Our approach leverages nontraditional investigative techniques and emerging analytical technologies. We recognize the value of working on the ground in the field, capturing local knowledge, and collecting original data to inform our analysis. At the same time, we employ cutting-edge technology to manage and analyze that data. The result is an innovative analytical approach to conflict prevention and mitigation.

ABOUT ROUTES AND *Runway to Extinction*

The USAID Reducing Opportunities for Unlawful Transport of Endangered Species (ROUTES) Partnership brings together transport and logistics companies, government agencies, development groups, law enforcement, conservation organizations, academia and donors to disrupt wildlife trafficking activities, and forms a key element of the concerted international response to addressing wildlife poaching and associated criminal activities worldwide.

Under the ROUTES Partnership, C4ADS aims to identify and track wildlife trafficking trends and methods, as well as assess the effects of ROUTES' efforts. Since 2015, ROUTES has focused on trafficking through the air transit sector, and thus Runway to Extinction examines the trends, transit routes, and trafficking methods used by wildlife smugglers exploiting the aviation industry in six world regions. This report adds to the information published in Flying Under the Radar (2017) and In Plane Sight (2018).

LEGAL DISCLAIMER

The mention of any individual, company, organization, or other entity in this report does not imply the violation of any law or international agreement, and should not be construed as such.

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COVER IMAGE

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EXECUTIVE SUMMARY

Once thought of as largely confined to Africa and Asia, wildlife trafficking has become increasingly prevalent all over the world, now ranking behind only drugs, human, and arms trafficking as the most valuable type of international organized crime by estimated annual value.¹ Wildlife trafficking's rise has been supported by the world's increasingly interconnected systems of finance, communication, and transport, which have brought once isolated source regions in remote areas closer and closer to large demand markets in North America, Europe, and Asia. The proliferation of air transport has exacerbated the issue even further; a trip that once would have taken months by land and by sea may now take 24 hours or less of travel in comparative calm and comfort.

While these changes have been boons for the global economy, they have also put wildlife at risk like never before.² The negative side effects of this economic progress are immediately evident in the substantial population decline of vulnerable species over the past few decades alone. If wildlife poaching and trafficking continues unabated at this scale, regional ecosystems face not just species extinction, but complete collapse. In the face of such catastrophic overexploitation, steps must be taken to reverse the damage caused by the creation of a global marketplace.

There is a silver lining, however; as wildlife traffickers have increasingly come to rely on income derived from wildlife native to other world regions, they have made themselves dependent on the international systems of transportation that made their illegal trade possible in the first place. As a result, implementing preventative measures against wildlife traffickers using international transport systems could increase the cost associated with trafficking wildlife to such an extent that traffickers may abandon the attempt.

To that end, the USAID Reducing Opportunities for Unlawful Transport of Endangered Species (ROUTES) Partnership was formed in 2015 to bring together transport and logistics companies, government agencies, development groups, law enforcement, conservation organizations, academia, and donors to disrupt wildlife trafficking through the air transport sector. C4ADS produces the data and analysis helping to guide the ROUTES Partnership's activities, and has so far published two reports, *Flying Under the Radar* (2017) and *In Plane Sight* (2018), examining trafficking trends, routes, and methods in airports for ivory, rhino horn, reptiles, birds, pangolins, mammals, and marine species since 2009.

1 Nelleman, C. (Editor in Chief); Henriksen, R., Kreilhuber, A., Stewart, D., Kotsovou, M., Raxter, P., Mrema, E., and Barrat, S. (Eds). The Rise of Environmental Crime – A Growing Threat to Natural Resources Peace, Development And Security. United Nations Environment Programme and RHIPTO Rapid Response–Norwegian Center for Global Analyses, 2016. http://unep.org/documents/itw/environmental_crimes.pdf.

2 Refer to **Appendix I: Security & Health Risks of Wildlife Trafficking** for a discussion of some of the risks posed by wildlife trafficking to the aviation industry.

While both previous reports focused on identifying trends associated with trafficking of different types of wildlife beginning in 2009, *Runway to Extinction* shifts gears, concentrating instead on recent trafficking trends (2016 – 2018) in six world regions: Africa, the Americas, Asia, Europe, the Middle East, and Oceania.³ Still, each successive report has shown that wildlife trafficking by air varies little from year to year and region to region, and so many of the key findings outlined in *Runway to Extinction* echo conclusions drawn in *Flying Under the Radar* and *In Plane Sight*.

In *Runway to Extinction*, as in *In Plane Sight* and *Flying Under the Radar*, C4ADS analyzes the seizure data in the C4ADS Air Seizure Database to determine wildlife trafficking trends, as well as the routes and trafficking methods utilized by wildlife traffickers. **The findings in this report are not meant to represent the entirety of wildlife trafficking activity through the air transport sector, but are intended to showcase the patterns visible within the C4ADS Air Seizure Database, with the understanding that a different or more complete dataset may reflect different results.** Each section of the report should be read with this in mind.

Note that the use of seizure data, while currently the best method available for investigating trafficking activity of all types, can lead to a variety of mistaken conclusions. For instance, better public seizure reporting may create the appearance of high levels of trafficking activity where only low levels exist. Still, seizure data, taken together with the appropriate caveats, provides a good picture of overall trafficking activity, and can be used to direct future anti-trafficking efforts.

Overall, *Runway to Extinction* finds wildlife trafficking to be global in scope, with trafficking attempts reported more and more frequently. This report's regional focus has emphasized the tendency of wildlife trafficking trends, routes, and methods to be determined more by the type of wildlife being trafficked than by the region it is trafficked in. Relatedly, each region's exposure to wildlife trafficking activity is driven primarily by its proximity to specific source regions and demand markets. Finally, wildlife traffickers tend to exploit the same vulnerabilities within airports that other traffickers do, giving enforcement authorities and the private sector an opportunity to address the weak points identified within this report and strengthen their defenses.

3 Data and graphics from the entire C4ADS Air Seizure Database (2009 through 2019) can be found on the ROUTES Dashboard at routesdashboard.org.

ABBREVIATIONS & DEFINITIONS

ABBREVIATIONS

- **ABF:** Australian Border Force
- **ACI:** Airports Council International
- **AVA:** Singapore Agri-Food and Veterinary Authority
- **C4ADS:** Center for Advanced Defense Studies
- **CBP:** US Customs and Border Protection
- **CITES:** Convention on International Trade in Endangered Species of Wild Fauna and Flora
- **FWS:** Fish & Wildlife Service
- **IATA:** International Air Transport Association
- **IFAW:** International Fund for Animal Welfare
- **KWS:** Kenya Wildlife Service
- **LEMIS:** Law Enforcement Management Information System
- **PROFEPA:** Mexican Federal Attorney for Environmental Protection
- **ROUTES:** Reducing Opportunities for the Unlawful Transport of Endangered Species
- **Semarnat:** Mexican Secretariat for the Environment and Natural Resources
- **TSA:** US Transportation Security Administration
- **UAE:** United Arab Emirates
- **UK:** United Kingdom
- **UNODC:** United Nations Office on Drugs and Crime
- **US:** United States
- **USAID:** United States Agency for International Development
- **WHO:** World Health Organization
- **WWF:** World Wide Fund for Nature (World Wildlife Fund in North America)

DEFINITIONS

- **Destination Location:** The intended destination of a trafficking instance.
- **Escalation Procedures:** Established communication channels and processes that move a report of possible illegal activity to enforcement officials with the power to act.
- **Flight or Flight Route:** The individual flights that make up a trafficking route (e.g. a trafficking route from New York, through London, to Munich would involve two flights).
- **Obfuscation Method:** The way in which contraband is concealed.
- **Open Source:** All publicly available sources of information.
- **Origin Location:** The origin of a trafficking instance, not to be confused with the source location (the source of trafficked wildlife).
- **Seizure:** A unique interdiction of wildlife or wildlife products.
- **Source Location:** The origin of trafficked wildlife or wildlife products (e.g. the Amazon), not to be confused with the origin location of a trafficking instance (e.g. Sao Paulo-Guarulhos Airport).
- **Trafficking Instance:** A singular incident of wildlife trafficking through a country, whether or not it was stopped (i.e. a country that makes few seizures may still have a high trafficking instance count).
- **Trafficking Route:** The path a trafficking instance took, or intended to take, from its origin to destination locations (e.g. “The trafficking instance left from New York, transited through London, and arrived in Munich”).
- **Transit Location:** The intended transit point(s) for a trafficking instance on the way from its origin location to its destination location.
- **Transport Method:** How contraband is moved through the air transport sector (e.g. passenger clothing/items, checked luggage, air freight, mail, or private plane).
- **Unique Flight Route:** The number of individual flight routes to or from a location (e.g. “Known trafficking instances into Munich traveled on three unique flight routes: London to Munich, Cairo to Munich, and Dubai to Munich”).

METHODOLOGY

Runway to Extinction is intended to provide insight into the operations of wildlife traffickers exploiting the air transport sector to move illegal wildlife and wildlife products from source to destination. This report focuses in particular on recent and developing trends in trafficking activity, as well as on the routes and trafficking methods that allow wildlife trafficking networks to operate.

Throughout the report, the terms “seizures” and “trafficking instances” are used. The term “seizures” is meant to refer to the interdiction of wildlife or wildlife products within an airport, while “trafficking instances” means the number of wildlife trafficking incidents that move through a country, whether or not they are seized there. For example, customs officials in Heathrow Airport in the UK may make a seizure of birds moving from the United States to Dubai in the UAE. This incident would be a “seizure” for the UK, and a “trafficking instance” for the United States, the UK, and the UAE. If the birds had been seized in the United States instead, the incident would become a “seizure” for the United States, and a “trafficking instance” for the United States, the UK, and the UAE.

DATA GAPS & BIASES

The reliability of the data compiled within the C4ADS Air Seizure Database, and as a result C4ADS’ associated analysis, is dependent on a variety of factors. Some airports and countries more proactively report on wildlife seizures, leading to an overrepresentation of those locations in the C4ADS Database. Other countries simply have better enforcement, while still other countries have effective customs and enforcement agencies but do not prioritize the identification of illegal wildlife.

One of seizure data’s biggest failings is inherent to its very nature—seizures can only capture trafficking strategies that have been ineffective. Along the same lines, seizures may reflect enforcement efforts operating as they should, and so high seizure numbers can be indicative of particularly

effective enforcement activity rather than an indication of a problem, as they are often interpreted. To that point, another significant downside to seizure data is its frequent inability to determine the cause of trafficking patterns. For instance, high seizure numbers in an airport can be due either to effective enforcement or high volumes of trafficking activity—sometimes both. Without being able to count the true number of trafficking instances that move through that airport undetected, it is impossible to know which factor plays the greater role, and therefore how to respond—should enforcement strategies be revised and improved, or can the country’s anti-wildlife trafficking strategy shift to begin to address wildlife trafficking before it reaches the airport, since enforcement within the airport is already functioning as needed?

Although there are no perfect solutions to these problems, comprehensive data collection can serve to alleviate a few.¹ Detailed route information, for example, can help to reveal whether illegal wildlife shipments are successfully moving through an airport to be seized elsewhere (poor enforcement or limiting legal frameworks), or if they are primarily seized prior to arrival at an airport (no impact on enforcement), or within an airport (good enforcement). As a result, C4ADS strove to base the analysis on detailed seizure data, supplemented with additional information wherever possible. **In this report, C4ADS provides seizure analysis with the acknowledgement that seizure data are an imperfect measure of an immeasurable crime, but with the understanding that even with its shortcomings, seizure data provide a rare window into otherwise clandestine trafficking operations.**

Refer to **Appendix II: Seizure Data & Runway to Extinction** for more discussion of the data and analytical methodology used in this report.

¹ A comprehensive look at the various biases and vulnerabilities associated with using seizure data to assess trafficking activity can be found in Appendix I of *Flying Under the Radar*.

TRANSPORT METHOD VARIES BY SPECIES

The type of wildlife or wildlife product being smuggled has a large effect on the transport method used to smuggle it. Raw ivory, for instance, is frequently transported in air freight given its size, shape, and smell, but worked ivory is generally transported in checked luggage or carried by passengers. Pangolin scales and certain marine species like dried seahorses and abalone are usually moved in large quantities, and are therefore often hidden in air freight. Reptiles, birds, mammals, totoaba bladders, and European eels are often moved by checked luggage, but can also be found in air freight (reptiles, mammals) and passenger carry-on items (birds, mammals). As a result, the most frequent transport methods used in a certain region or country will generally be determined by the type of wildlife trafficked there.

WILDLIFE TRAFFICKING BY MAIL LIKELY UNDERREPRESENTED

Mail shipments generally undergo less rigorous screening procedures than air freight consignments, which are shipped on commercial flights. Furthermore, it seems that seizures of wildlife or wildlife products discovered in the mail are less likely to be reported by relevant government authorities or by media outlets. As a result, mail seizures are likely underrepresented in the C4ADS Air Seizure Database.

DIFFICULTY OF MAKING SEIZURES IN TRANSIT

Most customs and enforcement officials currently have limited ability to screen passengers and shipments in transit, putting the burden of detection almost entirely on origin and destination locations. They are also hampered by short turnaround times for connecting flights, which do not allow enough time to effectively screen transiting passengers, luggage, air freight, and mail.

But improving screening for transiting passengers and shipments is challenging. For example, when passengers and shipments have extremely short layovers, adding another layer of screening is generally not feasible. In instances where a flight lands to offload some passengers and re-fuel before flying to another destination, many passengers and their luggage will not even exit the plane, and therefore cannot be screened. Note that it is possible that traffickers are aware of this and take advantage of these types of flight schedules when planning their route.¹

Three of the few possible opportunities to improve screening in transit are: increased reliance on sniffer dogs, which can screen a large number of passengers, suitcases, and shipments in a fraction of the time generally needed; e-technology, which allows for risk assessments of incoming passengers and cargo; and increased cooperation between airports along different flight routes, allowing enforcement in origin airports to alert enforcement in transit and destination airports to probable trafficking attempts.

¹ "South Africa seizes two Vietnamese with record 41kg of rhino horns." Toi Tre News. 2 Nov. 2014. <http://tuoitrenews.vn/society/23744/south-africa-seizes-two-vietnamese-with-record-41kg-of-rhino-horns>.

SECURITY SCREENING AT ORIGIN VERSUS CUSTOMS SCREENING AT DESTINATION

Screening procedures and priorities for departing flights differ significantly from arriving flights. Screening on departure and in transit is primarily done for aviation security purposes, and is not focused on identifying trafficking attempts. Screening on arrival is designed to uncover trafficking, but is conducted by customs agencies, who are mainly focused on revenue and agricultural disease protection. This set-up helps traffickers of wildlife and other contraband evade detection by skirting through screening checkpoints undetected.

Still, seizures made on departure are not infrequent; of the seizures in the C4ADS Air Seizure Database between 2016 and 2018, a third were made on departure, while 50% were made on arrival, and 17% were made in transit. This suggests that security screening may unintentionally reveal wildlife trafficking attempts, since the red flags for security risks and trafficking attempts can be similar (i.e. nervous behavior, bulky clothing, suspicious items in carry-on or checked bags, short turn-around time in-country after arriving on a long international flight, etc.), and both exploit some of the same security and screening vulnerabilities in airports.

SOURCE REGIONS IN THE SOUTHERN HEMISPHERE, DEMAND REGIONS IN THE NORTH

The most common routes for illegal wildlife and wildlife products often follow the most frequent air passenger routes from hub airports near supply markets in the Southern Hemisphere to hub airports near demand markets in the Northern Hemisphere. This could be a result of large middle classes in North America, Europe, and certain Asian countries creating significant demand for live animals and wildlife products sourced from remaining pockets of biodiversity in South America, Africa, and Oceania.

SUPPLY CHAINS NARROW AS THEY REACH THEIR DESTINATION

Origin points for different wildlife products are often varied, with trafficking instances involving certain species (e.g. seahorses) emanating from a wide variety of countries. Destination points, however, are often much fewer in number, creating a funnel effect as demand markets attract and consolidate product from source regions all over the world. Trafficking instance counts are therefore often higher in common destination countries.

Though this is often true for wildlife products, it is not always true for live animals valued as exotic pets, since demand for certain exotic pets is fairly widespread throughout several world regions (e.g. North America, Europe, the Middle East, and Asia). In other instances, in-demand species live only in a very specific area (e.g. totoaba in the Upper Gulf of California, or ploughshare tortoises in Madagascar), meaning the source regions for those species are just as few or fewer than the demand regions for the same species.

IMPORTANCE OF TRANSIT HUBS

Since hub airports are more likely to have a variety of international flight routes available for traffickers to choose from, they are more likely to be exploited by traffickers than smaller, regional airports. Certain types of trafficked wildlife also have very defined supply chains, and so travel through the same large, international transit hubs repeatedly. As a result, international airlines based at major hub airports are disproportionately exposed to trafficking. Targeting these chokepoints will therefore have a large impact on traffickers' operations.

Note though that increasing enforcement effectiveness in hub airports will likely push traffickers to rely on smaller international or regional airports. Authorities in these airports should be adequately prepared for any potential shifts in trafficking flight routes in their area (e.g. a significant increase in enforcement capabilities at John F. Kennedy Airport in New York should be accompanied by increases in enforcement preparedness at neighboring airports La Guardia and Newark).

IMPORTANCE OF SEIZURE REPORTING & ITS EFFECT ON APPARENT ENFORCEMENT SUCCESS

Analyses based on public seizure data are heavily dependent on frequent and thorough reporting by government agencies and media outlets. But seizure reporting often differs from region to region due to differences in government reporting protocols and varying media and public interest. For instance, seizures of wildlife and wildlife products from charismatic species (like elephants) and species facing well-documented and intriguing challenges (like the totoaba) are more likely to receive media attention, and are therefore more likely to be captured in the C4ADS Air Seizure Database. As a result, trafficking activity associated with those species can overshadow higher levels of trafficking affecting other, lesser known species.

Similarly, particularly good reporting can create the appearance of unusually effective enforcement where it is only mediocre, and can suggest disproportionately high levels of trafficking activity where there is little. This effect is especially pronounced when compared to countries with limited to no public reporting protocols but high levels of trafficking activity. Those countries generally either appear in the data as having ineffective enforcement (regardless of the true state of their enforcement capabilities), or no trafficking activity at all, obscuring significant risks to wildlife and allowing trafficking activity to continue unabated.

RELIANCE ON SNIFFER DOGS & EMERGING TECHNOLOGIES TO IMPROVE SCREENING

Steadily increasing passenger and cargo volume has put pressure on existing screening and enforcement procedures that are straining to deal with the increase. There are, however, a number of potential options available to improve customs screening and reduce aviation industry vulnerability to wildlife trafficking without overburdening officials or industry employees.

One way to do this would be to invest more heavily in sniffer dogs, which are able to screen large numbers of people, luggage, and shipments extremely quickly; for example, a 2016 Smithsonian documentary about Frankfurt Airport showed a sniffer dog checking 40 suitcases for drugs in 100 seconds.¹ Sniffer dogs can be trained to detect a wide array of contraband, and have been employed to great effect in Kenya's Jomo Kenyatta Airport in Nairobi.

Another solution would be to replace paper-based documentation with e-documentation systems, which can incorporate risk management systems designed to identify suspect activity, thereby improving interdiction success rates. E-documentation risk management systems can also alert customs and enforcement to inbound passengers or shipments that display multiple red flags for trafficking activity based on pre-established risk factors. In addition, the speed with which documentation moves through an e-documentation system could both improve official response times and, through integrated messaging, increase communication between different national customs and enforcement agencies.

¹ "X-Ray Mega Airport: Crossroads of the World." Smithsonian Channel, 5 Aug. 2016. www.smithsonianchannel.com/videos/how-drug-sniffing-dogs-search-your-checked-luggage/50078.

WILDLIFE PRODUCT PROCESSING INCREASINGLY OCCURS IN SOURCE REGIONS

Over the past few years, seizures and other enforcement actions in Africa, the Americas, and Asia have indicated that wildlife product processing is increasingly occurring in source or origin countries, rather than near demand markets. This phenomenon is likely driven in part by the challenges inherent in trafficking raw materials over long distances; raw ivory and raw rhino horn, for instance, are much larger and more unwieldy than worked ivory and rhino horn products. Trafficking networks have likely realized that processing wildlife products in source regions and flying final or near-final products to demand markets helps them evade detection, since worked wildlife products are easier to carry, difficult to attribute to specific protected species, and occasionally even difficult to identify as wildlife derivatives. Traffickers carrying small quantities of wildlife products on their persons or in their luggage can also claim to be tourists, unaware of wildlife trafficking regulations and innocent of intentional criminal activity. Note that this phenomenon is far more prominent in seizures made in air transport than in seizures of maritime shipments.

OVERVIEW

FIGURE 1

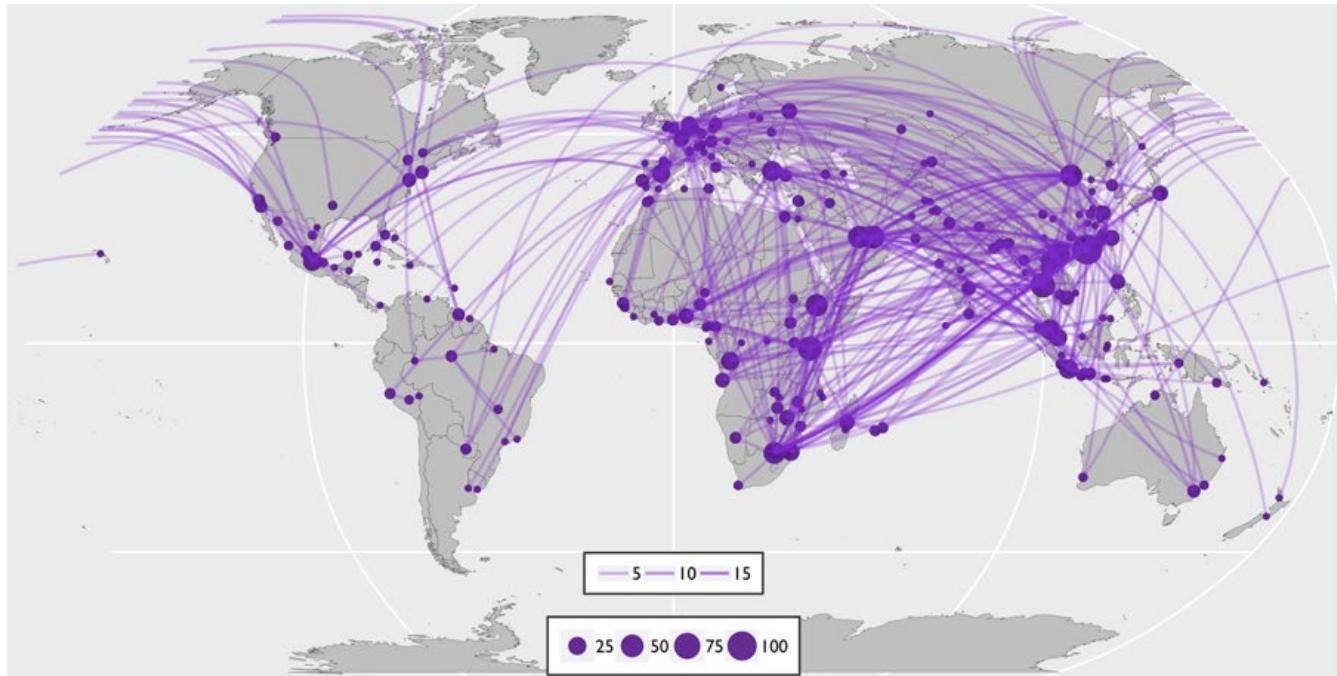


Figure 1. All air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

The trafficking routes map represents the flights used to traffic wildlife products through the air transport sector. This includes instances where the product did not actually enter a country because it was seized earlier in the route. The transparency of the line for each route represents the number of times it was used. The bubbles represent the total number of flights to and from each city.

The global routes map indicates that in just three years, wildlife trafficking by air passed through every world region repeatedly, reflecting the illegal wildlife trade's truly global scope. Still, wildlife trafficking activity did seem to cluster slightly in certain countries and areas, such as Mexico, Europe, the UAE and Qatar, Southern and Eastern Africa, and virtually all of East and Southeast Asia. China in particular seems to count hundreds of trafficking instances flying in to and out of the country. In fact, Table I reveals China experienced over 200% more known trafficking instances than Vietnam, the second-ranking country by trafficking instance count, between 2016 and 2018.

Similarly, of the ten countries linked to the most instances of wildlife trafficking in their airports between 2016 and 2018 according to the C4ADS Air Seizure Database, five were Asian, three were African, one was American, and one was Middle Eastern. The dominance of Asian countries in Table I is likely driven by a variety of factors, including high demand for wildlife and wildlife products; significant levels of intra-regional trafficking activity; and generally frequent seizure reporting with sufficient detail to allow for inclusion in the C4ADS Air Seizure Database. The other countries appearing in Table I tended to have either high biodiversity, high awareness of wildlife trafficking, or good public reporting protocols.

TABLE 1

COUNTRY	TRAFFICKING INSTANCES
China	240
Vietnam	76
Thailand	57
Indonesia	56
South Africa	56
Mexico	51
UAE	44
Malaysia	40
Kenya	33
DRC	32

Table I. Top ten countries by number of trafficking instances (2016 – 2018)

FIGURE 2

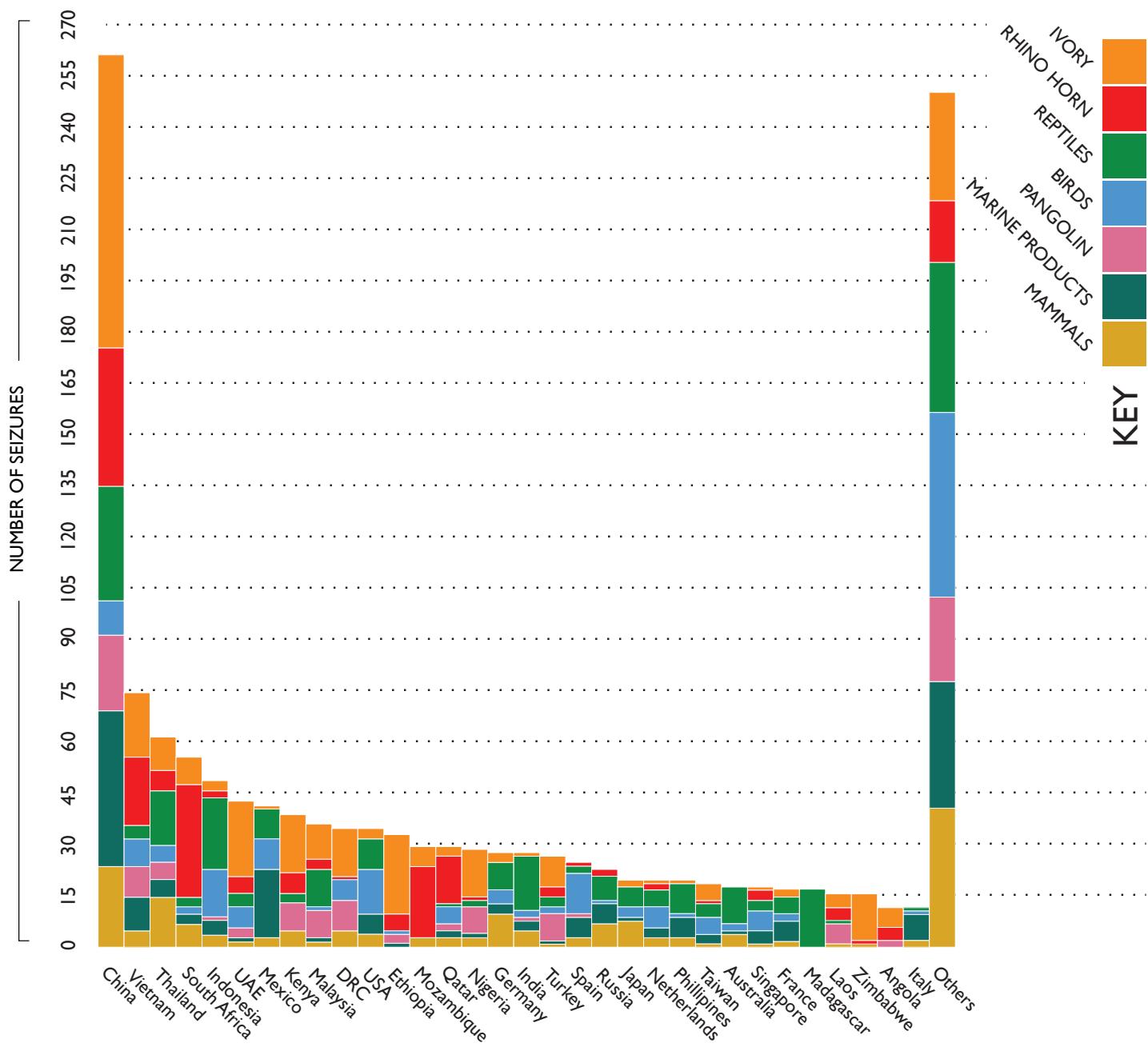


Figure 2. Number of seizures by country (2016 – 2018)

Figure 2 displays the 18 countries with the highest number of seizures in the C4ADS Air Seizure Database between 2016 and 2018. As in the global routes map, Figure 2 shows wildlife trafficking by air to be widespread throughout the world's regions, with at least one country from every region other than the Middle East appearing as one of the top 18 countries by seizure count. Each country also made a wide array of wildlife seizures, although some countries did seem to prefer certain types of wildlife (e.g. ivory in China, marine species in Mexico, rhino horn in South Africa and Mozambique, and reptiles in India). Note that countries appearing in Figure 2, which is measured by seizure count, and not in Table I, which is ranked by trafficking instance count, may be better able to report successful seizures or stop wildlife trafficking attempts.

IMPORTANCE OF SEIZURE REPORTING

FIGURE 3

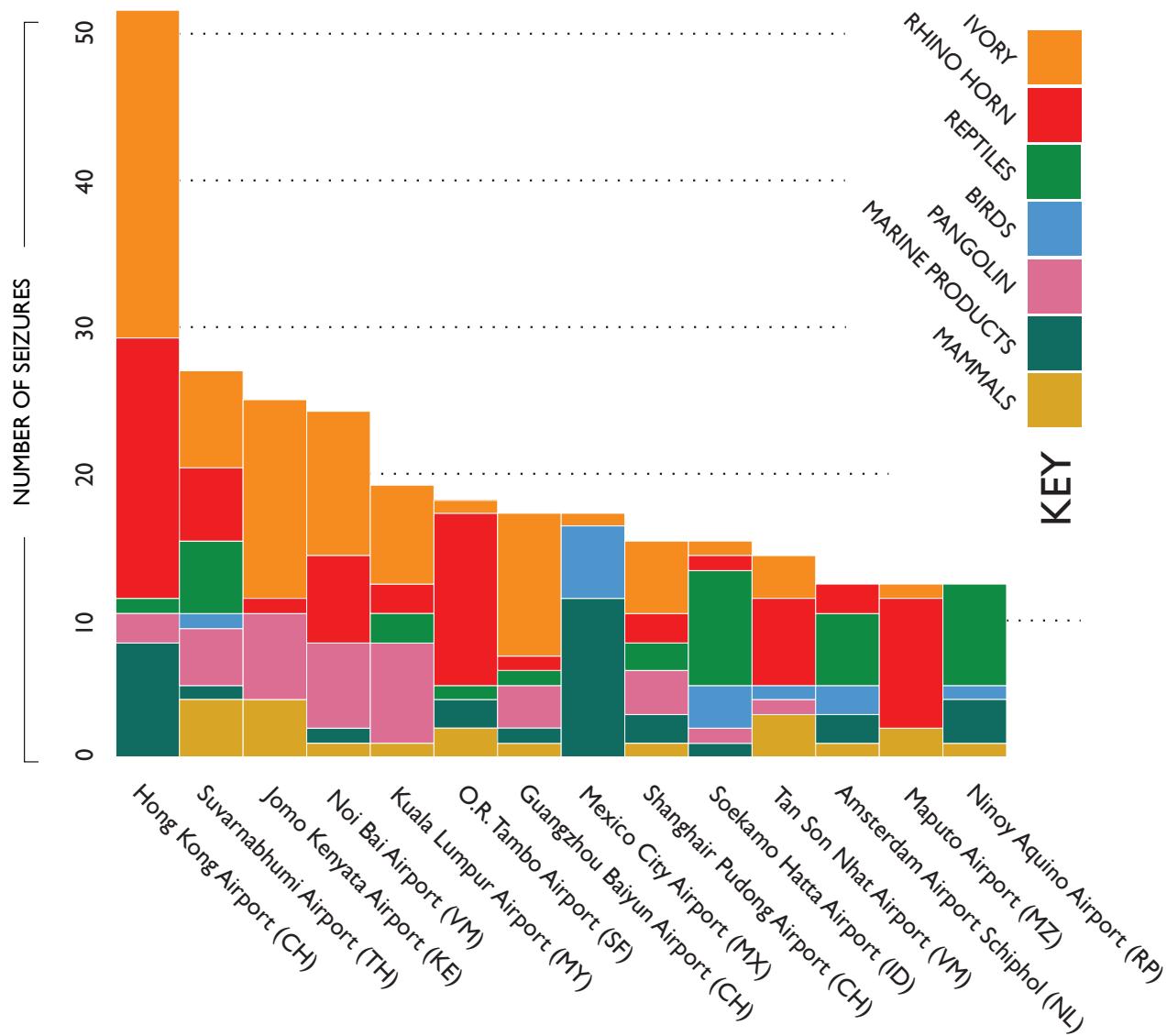


Figure 3. Airport seizure count for airports with 12 or more seizures (2016 – 2018)

China's dominance is once again clearly visible in Figure 3, which presents seizure counts for airports with 12 or more seizures between 2016 and 2018. Hong Kong Airport alone numbers roughly twice as many seizures as any other airport, and two other Chinese airports, Guangzhou Baiyun and Shanghai Pudong, also appear. China's prominence seems to have grown over the past few years; although Hong Kong and other Chinese airports also ranked highly in terms of seizure count in Flying Under the Radar (2017) and In Plane Sight (2018), other airports consistently ranked higher. China's growing seizure count could be a result of good seizure reporting, higher levels of wildlife trafficking awareness, improving enforcement protocols, or increasing levels of trafficking activity.

Figure 3 also reveals how seizures of certain wildlife and wildlife products tend to cluster along their supply chains. For instance, ivory, rhino horn, and pangolin products tend to follow similar Africa to Asia trafficking routes, occasionally passing through Europe or the Middle East on the way. Most airports in Figure 3 that made seizures of ivory, rhino horn, or pangolin counted seizures of all three, and were located in Africa or Asia.

Understanding how wildlife trafficking moves through the aviation industry is absolutely essential to counteracting it. Seizure data reveals that wildlife trafficking networks often rely on the same transport methods over time, and that even across networks, traffickers of certain species and wildlife products tend to use the same transport methods repeatedly. Knowing what generally moves through a specific area can therefore help customs and enforcement target the most relevant transport methods used for wildlife trafficking in their airport.

Between 2016 and 2018, checked luggage was by far the most common transport method used by wildlife traffickers, accounting for over twice as many trafficking instances as any other transport method according to the C4ADS Air Seizure Database. The prominence of checked luggage is driven by its relevance to almost every wildlife category covered in this report. Rhino horn in particular is generally trafficked in checked luggage, but ivory, totoaba bladders, turtles, birds in cages, and sedated live animals also frequently move in checked luggage.

While ivory is frequently smuggled in checked luggage, more ivory by weight is moved in air freight. But recent shifts in wildlife product processing towards source regions, likely intended to make trafficking attempts more difficult to identify, suggest that seizures of raw ivory in air freight shipments may decrease, and seizures of worked wildlife products in luggage and in passenger carry-on items may increase. Already small seizures of worked ivory in China have become more frequent, with 78% of ivory seizures in the C4ADS Air Seizure Database including worked ivory in 2018, compared to 28% in 2016.

Finally, although mail seizures are almost certainly understated in Figure 4, they are growing in prominence, perhaps reflecting a change in enforcement awareness, an improvement in mail screening protocols, or a heightened emphasis on reporting. Australia in particular has shown a skill for identifying trafficking attempts in mail shipments.

Note that less effective trafficking methods are more likely to be intercepted, and therefore included in the analysis, whilst the most effective tactics may never be identified. It is also possible that the transport method results reflect the relative success of customs screening for each respective transport method. For example, checked luggage seizures could be high as a result of comparatively effective customs screening methods for luggage, and air freight seizures could be low due to comparatively ineffective customs screening procedures for air freight consignments.

FIGURE 4

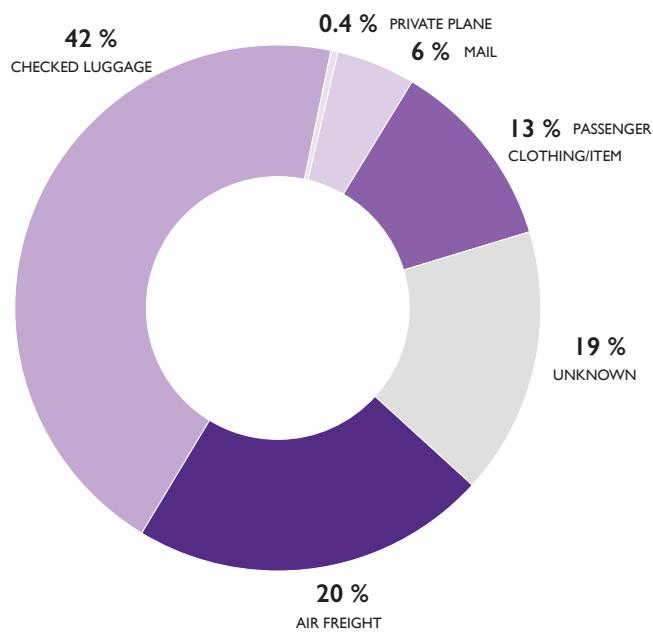


Figure 4. Transport methods for all seizures in the C4ADS Air Seizure Database (2016 – 2018)

AFRICA

MAIN TAKEAWAYS

African countries are primarily origin points.

Africa is a prominent source region for ivory, rhino horn, pangolin, marine species (abalone, European eels), and mammals (cheetah cubs, lion claws, etc.).

Specific countries (Kenya, South Africa, and Ethiopia) feature prominently as transit points due to their large international airports with varied flight routes and/or their geographic position closer to demand regions.

One country in particular, Kenya, has displayed a unique ability to seize trafficked wildlife in transit by relying in part on teams of sniffer dogs that reduce screening time while improving screening effectiveness.

Ivory seizures in air transport have slightly decreased by volume while rhino horn seizures have increased in number between 2016 and 2018.

Checked luggage trafficking instances may become more prominent over time (and air freight trafficking instances correspondingly less prominent) if wildlife product processing moves closer to origin regions, since seizure data suggests worked wildlife products are more likely to be transported by checked luggage or by passengers than raw ivory or rhino horn.

FIGURE 1

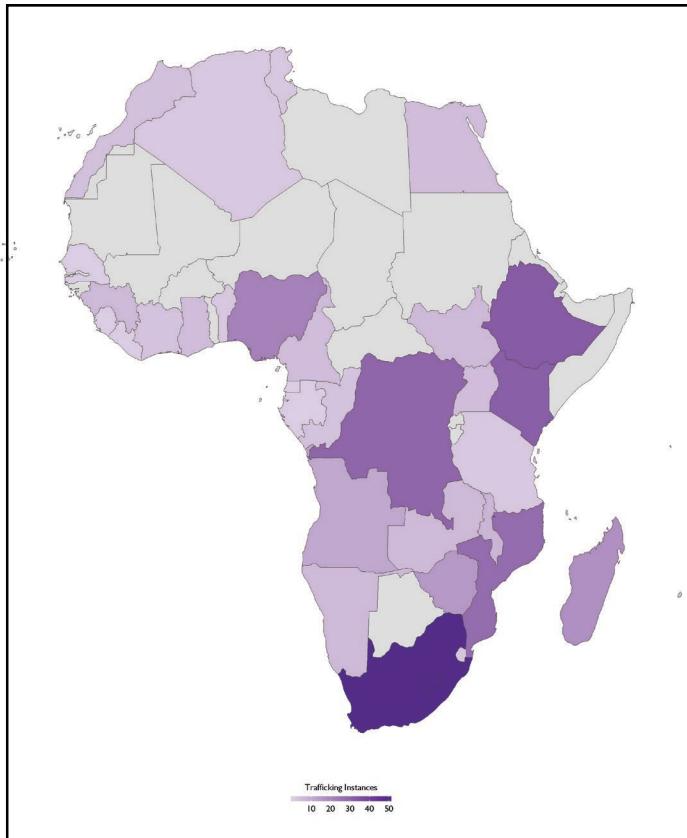


Figure 1. Heat map for wildlife and wildlife product trafficking instances in Africa's air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

Those countries that appear prominently in the African heat map have generally either one or both of the following: significant remaining elephant, rhino, pangolin, mammal, bird, or reptile populations (South Africa, Mozambique, the DRC, Madagascar), or large international airports with many connecting flight routes to demand regions (Nigeria, Kenya, Ethiopia).

Importance of land routes

It is possible that some countries are underrepresented in the heat map because wildlife and wildlife products may be transported by land from one country to another to access airports that are perceived to be advantageous. For instance, it is possible that wildlife poached in Niger, Chad, or Cameroon is driven to one of Nigeria's multiple international airports with connecting flights to Europe and East Africa. This tactic has been used before by traffickers driving products back and forth over the Kenya-Uganda border to evade higher levels of enforcement activity and awareness.¹

Emergence of North Africa

North African countries are not generally considered prominent countries for wildlife trafficking activity, particularly in comparison to their southern and eastern neighbors. But critically endangered European eels, which are seized increasingly frequently in European airports, are native to North African countries Algeria, Morocco, and Tunisia. Recent enforcement busts in Europe, particularly in Spain

and Portugal, have revealed small-scale but well-organized trafficking networks shipping juvenile eels in the tens of thousands to Asian demand markets through prominent North African and European airports (see European Eel Trafficking).

Other North African trafficking instances either involved reptiles or were passing through North Africa on the way from West Africa to Europe or Asia.

FIGURE 2

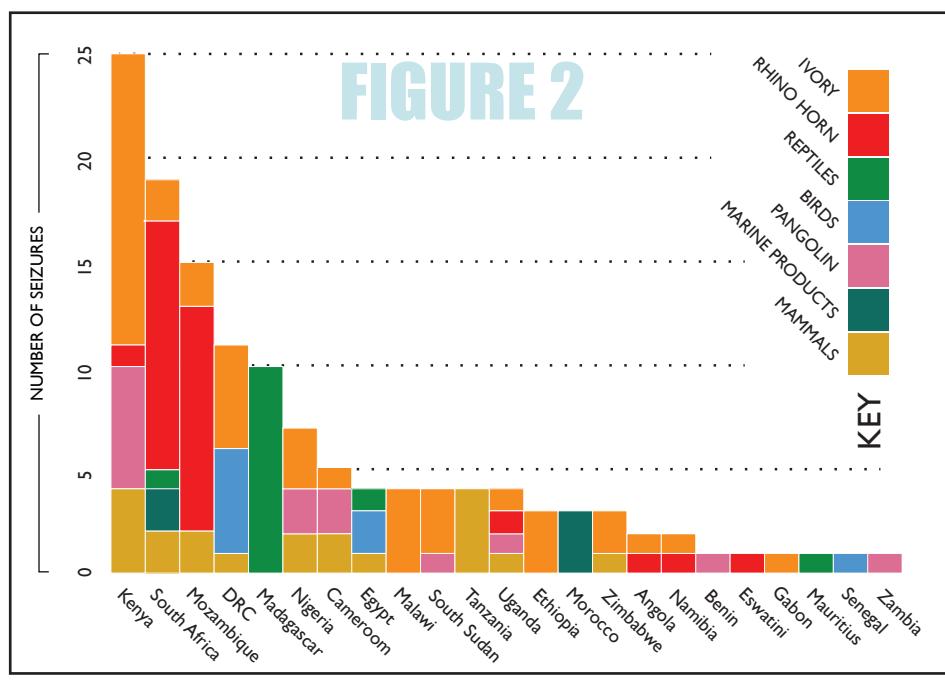


Figure 2. Total seizure count by African country (2016 – 2018)

Figure 2 displays the data within the Africa heat map in more detail. Prominent countries from the heat map are distributed by seizure count, highlighting those countries where enforcement efforts have been most effective.

FIGURE 3

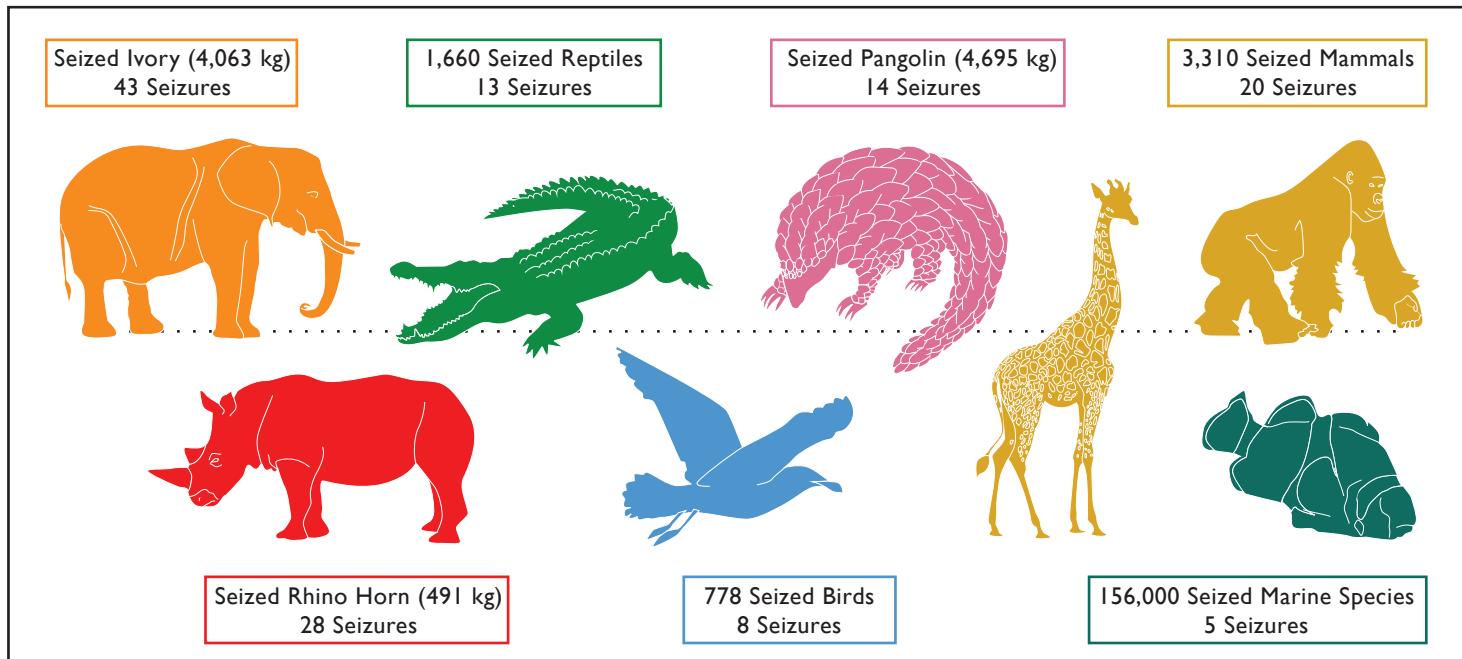


Figure 3. Number of seizures in Africa of each type of wildlife or wildlife product (2016 – 2018)

Diverse types of wildlife seized

Enforcement officials in African airports have seized a wide array of wildlife and wildlife products over the past three years, although ivory and rhino horn seizures are most common. African biodiversity and the many different biomes present within the continent make Africa an unusually plentiful source region for traffickers targeting everything from elephants to lions, European eels, and abalone.

Prominence of Kenya and South Africa

Between 2016 and 2018, Kenya counted the most wildlife seizures of any African country according to the C4ADS Air Seizure Database. Kenya's prominence is primarily due to two factors: Jomo Kenyatta Airport's role as a major hub between flight routes originating in Africa and destined for the Middle East and Asia, and Kenyan enforcement's awareness of the prevalence of wildlife trafficking activity in their airports. This likely leads to both the country's high seizure count and the fairly diverse array of wildlife seized there (including ivory, rhino horn, pangolin scales, and various mammal products).

Although South Africa is a common origin point for ivory, rhino horn, and marine species trafficking, the country also plays a prominent role as a transit location for trafficking instances originating elsewhere in Southern Africa. South Africa's OR Tambo Airport in Johannesburg counts dozens of connecting flights a day to the Middle East and Southeast Asia, providing traffickers in the region with a gateway to demand markets in other world regions. The airport's geographic location and flight routes mean it often acts as a funnel for

a significant amount of wildlife trafficking leaving Southern Africa.

Both Kenya and South Africa appear as two of the most prominent wildlife trafficking countries in Africa by seizure count, at least in part due to their role as countries with common transit airports. But customs and enforcement in most airports find identifying trafficked goods in transit difficult, if not impossible, given the short duration of most layovers. Most common transit countries, like Ethiopia, count comparatively few seizures in part because of this.

Seizure rates in Kenya and South Africa may have outpaced seizure rates in other common transit countries because Kenyan and South African officials, noting the high numbers of wildlife trafficking instances leaving their airports only to be seized elsewhere, have dedicated resources to screening passengers and cargo on departure and in transit. To address the difficulty of manually screening high volumes of passengers and shipments effectively and quickly, enforcement agencies in both countries have chosen to rely on sniffer dogs.ⁱ For instance, after a series of seizures in Asia arriving on flights from South Africa, South African authorities began "increased enforcement interventions on outbound flights at the cargo area of OR Tambo Airport" using sniffer dogs.ⁱⁱ The strategy appears to be helping; in January 2019, a South African Revenue Service detector dog, Lizzy, discovered 36 rhino horn pieces hidden under "laminated wooden sheets in four boxes...filled with doormats and decorative items."ⁱⁱⁱ

IMPORTANCE OF TRANSIT HUBS

IMPORTANCE OF TRANSIT HUBS

RELIANCE ON SNIFFER DOGS & EMERGING TECHNOLOGIES TO IMPROVE SCREENING

ⁱOne sniffer dog is able to check 40 suitcases for drugs in 100 seconds.

Source: "X-Ray Mega Airport: Crossroads of the World," Smithsonian Channel, 5 Aug. 2016. www.smithsonianchannel.com/videos/how-drug-sniffing-dogs-search-your-checked-luggage/50078.

FIGURE 4

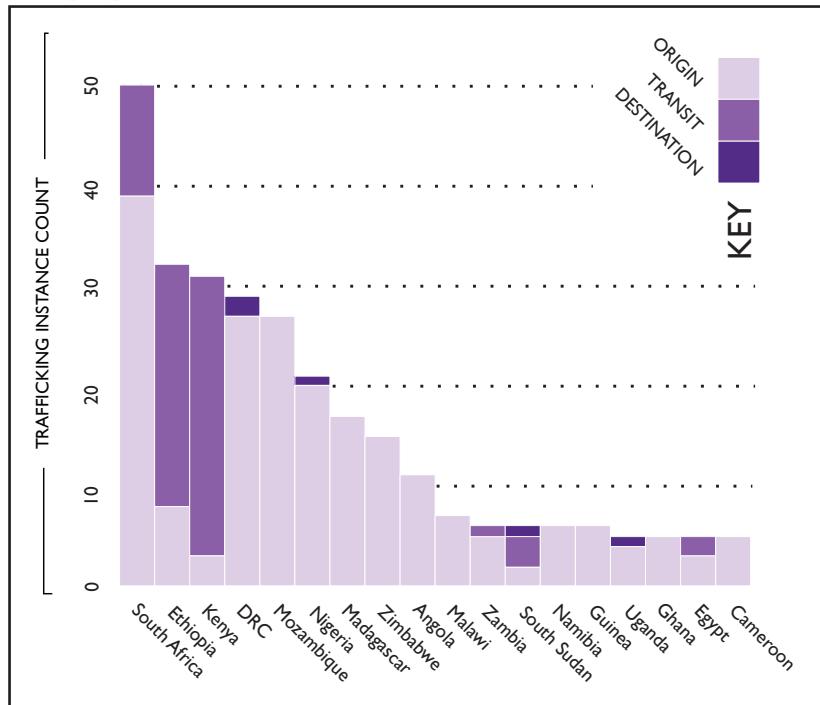


Figure 4. Country-level flight route information for African countries with five or more trafficking instances (2016 – 2018).

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

Figure 4 emphasizes the importance of African airports as origin points for trafficked wildlife and wildlife products given the continent's diverse array of species. Only three countries – Kenya, Ethiopia, and South Sudan – are not predominantly origin countries.

Difficulty of making seizures at origin

Customs authorities, the agencies usually charged with intercepting wildlife, generally do not conduct screening on departure. As a result, most origin countries miss the majority of trafficking activity leaving their airports. Figures 4 and 5 reveal this phenomenon in abundance in Africa, where most countries act as origin points for wildlife trafficking and simultaneously do not stop the majority of trafficking instances leaving by air.

Countries like South Africa, Mozambique, and Madagascar appear to be comparatively more adept at discovering wildlife trafficking instances before they depart. These countries' higher seizure numbers are likely driven by higher levels of trafficking activity and higher levels of wildlife trafficking awareness amongst officials. Each of the three countries is known to struggle with ongoing poaching activity within their borders (primarily rhino poaching in South Africa and Mozambique, and reptile poaching in Madagascar).

Seizures in transit

Only four African countries appear to make many seizures in transit: South Africa, Kenya, Ethiopia, and South Sudan. Both South Africa and Kenya experience high levels of trafficking activity, and have adapted to counteract the exploitation of their airports by wildlife traffickers through the use of sniffer dogs and other enforcement strategies. Ethiopia and South Sudan's seizures, however, are less expected.

Ethiopia, with the second-highest number of transit instances in Africa, exhibits seizure numbers that clearly reflect its status as a transit country, with Ethiopian authorities stopping only three of the 32 known trafficking instances that passed through its airports (a 9% success rate). But South Sudan has a comparatively high seizure count, especially given limited resources in the country. For example, after sniffer dogs discovered 500 kg of ivory in Juba Airport in 2016, Khamis Adieng of South Sudan's National Wildlife Service said, "We have no modern technology...and that is why it has become easy for [smugglers] to pass through South Sudan."^{iv} Adieng's comment suggests that wildlife traffickers smuggle animals and products through South Sudan frequently without being seized, creating the appearance of only low levels of trafficking where really trafficking is prevalent and successful.

FIGURE 5

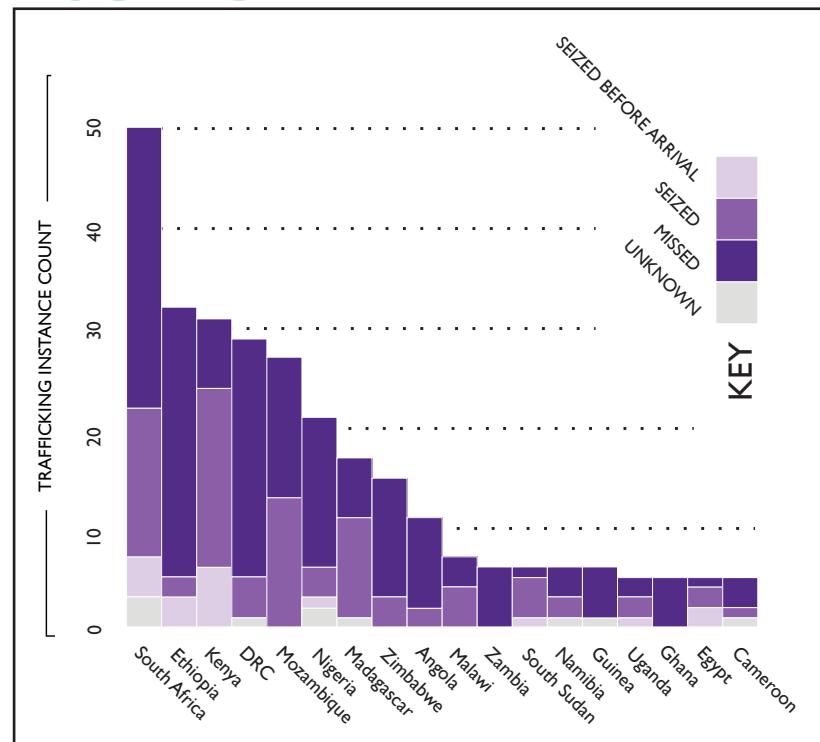


Figure 5. Point of seizure within the supply chain by African country (2016 – 2018).

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

SNIFFER DOGS

As air passenger and cargo volumes increase, customs and enforcement authorities will have to expedite screening processes while at the same time improving screening effectiveness. Over the past several years, officials in an increasingly large number of airports have relied on sniffer dogs to help screen passengers, checked luggage, and air freight shipments quickly and effectively.

Dogs can be trained to detect everything from cancer to bed bugs, currency, and invasive species, and have been used by enforcement authorities to identify explosives and drugs since at least the mid-1900s.^v But it was only in the 2000s that enforcement began to train dogs to detect wildlife at border crossings and other ports of entry. Two of the first countries to rely on wildlife sniffer dogs (also called detector dogs), Germany and Kenya, trained their first sniffer dog teams in 2008^{vi} and 2009^{vii} respectively. Since then, authorities have consistently made wildlife seizures based on sniffer dog detections, in one instance making four ivory seizures in one week in Jomo Kenyatta Airport.^{viii} After the seizures, Mark Kinyua of KWS noted, “It speaks volumes if you can arrest people like that consecutively. It is a huge deterrent.”^{ix}



Image 1. Sniffer dog Rocco and Kenya Wildlife Service canine handler Patrick Musau check suitcases for wildlife at Jomo Kenyatta Airport in Nairobi, Kenya. Source: AFP

Sniffer dogs are particularly valuable given their ability to smell wildlife despite traffickers' attempts to hide smuggled animals or products. For example, dogs can smell through heavy packaging and other competing smells like pepper and tobacco,^x and can detect small quantities or even powder versions of various wildlife products.^{xi} They can also be trained to detect several different types of contraband, meaning one dog can be used to find explosives, drugs, and smuggled wildlife.

Sniffer dogs' effectiveness in the airports where they are deployed has not been lost on enforcement agencies in other countries. In the past few years, sniffer dog teams have joined the screening process at airports in Namibia,^{xii} and in Kamuzu Airport in Malawi,^{xiii} Maputo Airport in Mozambique,^{xiv} and various other airports throughout Africa and Europe.

Note, however, that sniffer dogs are likely most helpful when their successes are well-reported, alerting traffickers to their presence and creating a deterrent effect. While this means that airports with sniffer dogs may see seizures

fall as traffickers opt for alternate routes, it also means that enforcement in nearby ports and border crossings must be prepared to deal with an increase in trafficking attempts. For example, in 2018, Steven Njumbi with IFAW stated that as sniffer dogs became more active at Jomo Kenyatta Airport in Kenya and Entebbe Airport in Uganda, traffickers began relying more heavily on Malaba and Busia on the Kenya-Uganda border to smuggle ivory.^{xv}



Image 2. A German sniffer dog appears to smell hidden live animals or wildlife products in a suitcase. Source: picture-alliance/dpa

Still, the successes of sniffer dogs speak for themselves. As Birgit Braun with WWF told Germany's Deutsche Welle, “A dog's nose is more effective than any technical equipment they have at the airport.”^{xvi} As global reliance on air transport continues to increase, training sniffer dogs to detect wildlife and other contraband will be one of the most effective strategies available to enforcement to expedite and improve screening in airports around the world.



Image 3. A US Fish and Wildlife Service Detector Dog, Lockett, poses with turtles she discovered. Source: US Fish and Wildlife Service

FIGURE 6

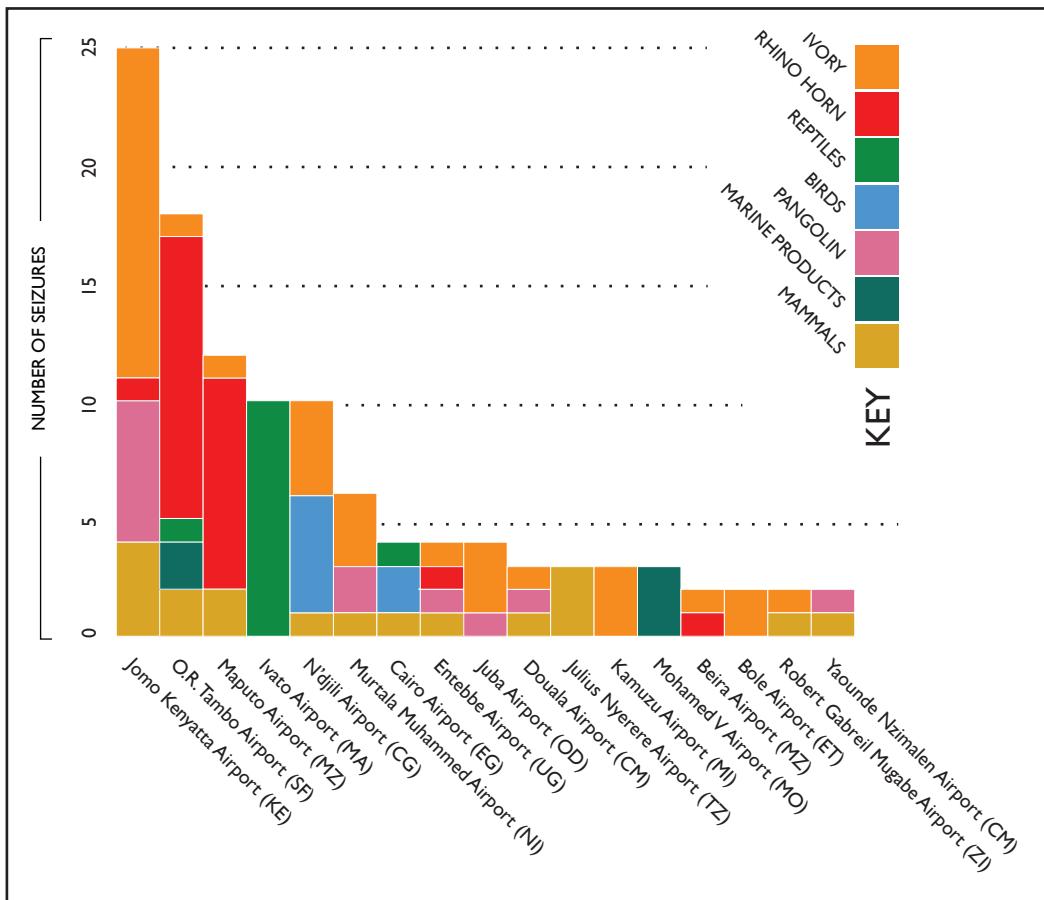


Figure 6. Airport seizure count for African airports with two or more seizures (2016 – 2018)

Three countries had multiple airports with two or more wildlife seizures between 2016 and 2018: Mozambique (Maputo Airport and Beira Airport), Nigeria (Murtala Muhammed Airport and Mohamed V Airport), and Cameroon (Douala Airport and Yaounde Nsimalen Airport).

Seizures in transit countries are most diverse

Enforcement officials in African airports made a wide variety of wildlife and wildlife product seizures between 2016 and 2018. Airports with the most diverse set of seizures tended to be the primary international airport in a prominent transit country (e.g. Kenya's Jomo Kenyatta Airport, South Africa's OR Tambo Airport, and Uganda's Entebbe Airport).

High seizure numbers at certain origin airports

Despite the difficulties inherent in confiscating trafficked wildlife and wildlife products on departure, authorities in common origin points Maputo Airport, Mozambique; Ivato Airport, Madagascar; and N'djili Airport, DRC made a high number of wildlife seizures. Reports of seizures in all three airports gave few indications as to what might be driving their unusually high seizure counts – the method authorities used to detect the seized wildlife varied significantly from x-ray, to suspicious behavior, to “discovered

during check-in.” The absence of a particularly effective or coordinated identification strategy suggests that these high seizure counts may be reflecting high levels of trafficking activity emanating from these countries.

Seizures tend to cluster in certain areas

Seizures of different types of wildlife tended to occur along established supply chains for each species. Rhino horn seizures, for instance, occurred exclusively in Southern Africa (OR Tambo Airport, Maputo Airport, and Beira Airport) where rhino populations still exist in significant numbers, and in common transit airports for rhino horn trafficking instances moving from Africa to Asia (Jomo Kenyatta Airport and Entebbe Airport).

Similarly, airports in exclusively origin countries (i.e. countries that are rarely or never used as transit points) seized only wildlife native to their country. For example, Ivato Airport in Madagascar, a country well-known for its unique reptile species, made only reptile seizures.

FIGURE 7

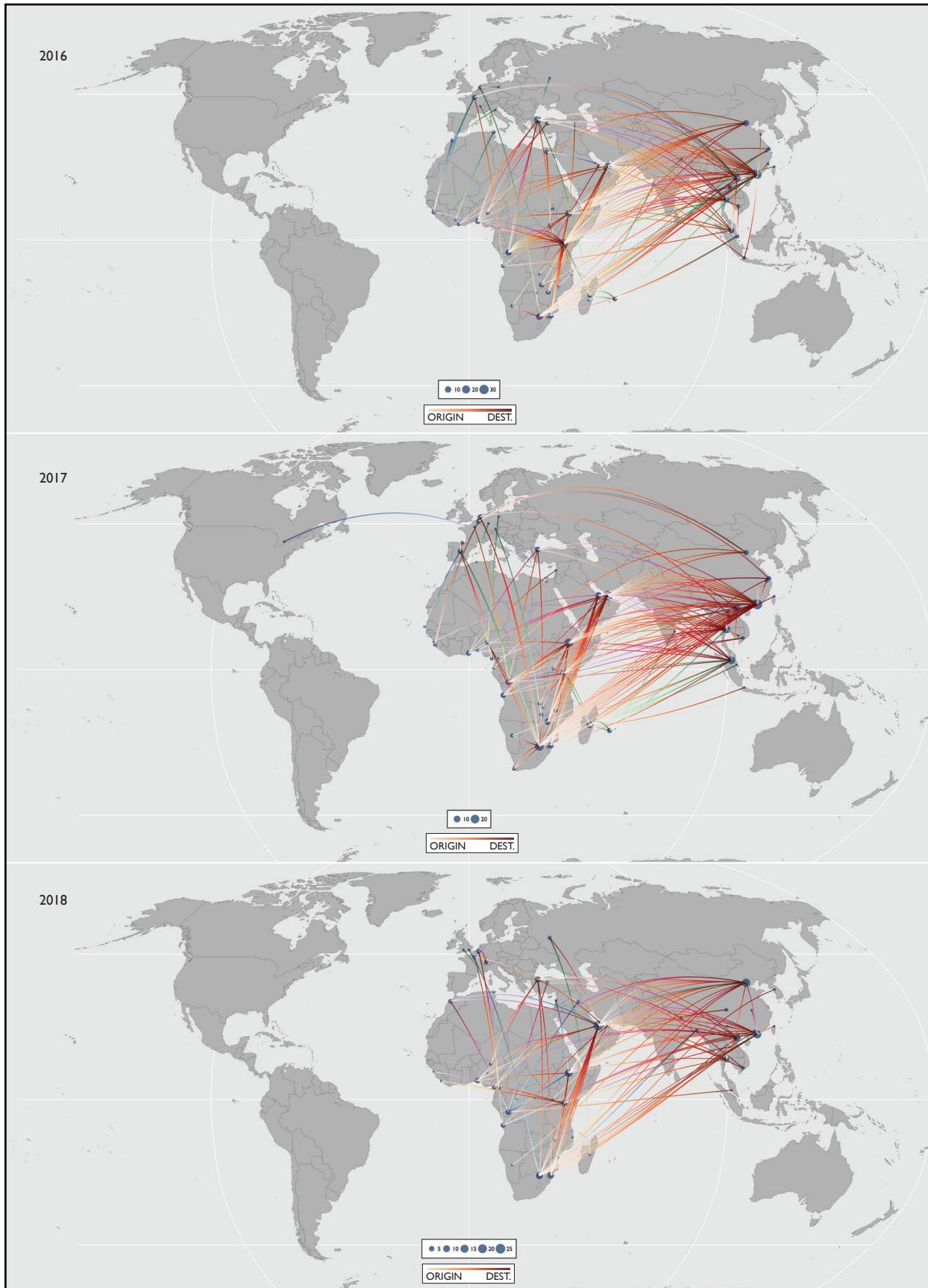


Figure 7. African air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city. Capital cities are used when specific airports are unavailable.

The routes maps for African air trafficking routes indicate consistently high seizure levels in Africa between 2016 and 2018, although seizures in 2018 appear fewer than in the previous two years, with only 106 trafficking instances counted in the C4ADS Air Seizure Database in 2018 compared to 145 and 157 in 2016 and 2017 respectively. The routes maps further reveal that Asia is the primary destination region for most wildlife and wildlife products leaving Africa, although some species – particularly reptile species – are often destined for Europe.

Ivory trafficking cedes to rhino horn trafficking

In 2016, ivory trafficking flight routes appeared prominently throughout most of Africa, generally passing through East Africa and the Middle East on the way to East Asia. Over the next two years, ivory flight routes seemed to diminish, and other categories of wildlife trafficking became more prominent. At the same time, rhino horn flight routes appeared to increase in 2017, with one direct flight between Johannesburg and Hong Kong exhibiting especially high levels of rhino horn trafficking activity. By 2018, both ivory and rhino horn trafficking activity seemed to have decreased slightly, although common flight routes for both remained (e.g. Johannesburg → Hong Kong and Johannesburg → Doha → China for rhino horn, and various African countries → Addis Ababa → China for ivory).

FIGURE 9

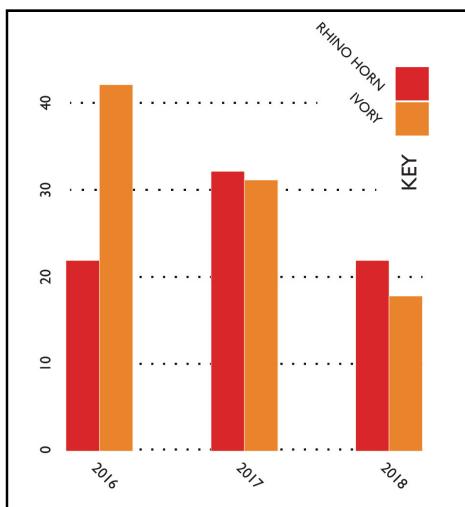


Figure 9. Ivory and rhino horn trafficking instances (2016 – 2018)

Importance of transit hubs

Europe, the Middle East, and East Africa all emerged as clear transit regions for wildlife trafficking instances leaving Africa. Within each area, certain airports stood out as particularly important, such as Jomo Kenyatta Airport in Kenya, Bole Airport in Ethiopia, Dubai Airport in the UAE, Doha Airport in Qatar, Charles de Gaulle Airport in France, and Istanbul Ataturk Airport in Turkey. Each of these airports was used consistently by traffickers of different types of wildlife and wildlife products.

But some common transit hubs visible in the Africa routes map were used more frequently by specific types of wildlife traffickers. For instance, smuggled reptiles leaving Madagascar almost always flew through either Jomo Kenyatta Airport in Kenya, Sir Seewoosagur Ramgoolam Airport in Mauritius, or Roland Garros Airport on Réunion Island on the way to Southeast and East Asia. Similarly, OR Tambo Airport was clearly a key transit hub for rhino horn leaving other Southern African countries such as Namibia, Mozambique, Eswatini, and Zambia and destined for China.

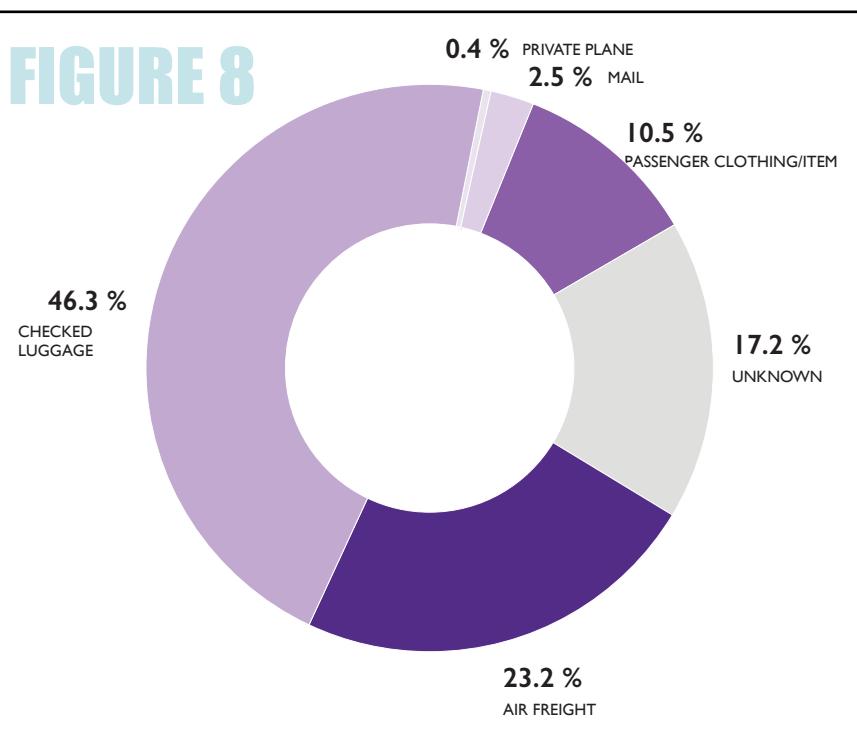


Figure 8. Transport methods for African trafficking instances in the air transport sector (2016 – 2018)

More wildlife trafficking instances moving through Africa were transported by checked luggage (47%) than by any other transport method.² Ivory and pangolin, however, were more likely to be smuggled by air freight, and together made up 48% of African air freight instances in the C4ADS Air Seizure Database.

Prevalence of air freight

Wildlife traffickers in Africa, Asia, and the Middle East were more likely to smuggle contraband in air freight than traffickers in the Americas, Europe, or Oceania. This was likely driven by ivory and pangolin scale supply chains, both of which generally originate in Africa and pass through the Middle East on the way to Asia. Other African species and wildlife products

²See previous reports Flying Under the Radar (2017) and In Plane Sight (2018) for more detailed information on trafficking methods used for different types of wildlife.

Trafficking methods used for ivory, rhino horn, reptiles, pangolins, and mammals are all relevant to wildlife trafficking by air in Africa.

trafficked in air freight between 2016 and 2018 included rhino horn, dried seahorses, and abalone, all of which occasionally followed the same routes as ivory and pangolin scales through the Middle East and into Asia.

Wildlife product processing increasingly occurs in source regions

Over the past few years, seizures and other enforcement actions in Africa have indicated that wildlife product processing is increasingly occurring in source or origin countries, rather than near demand markets. This phenomenon is likely driven by the challenges inherent in trafficking raw materials over long distances; raw ivory and raw rhino horn, for instance, are much larger and more unwieldy than worked ivory and rhino horn products. Trafficking networks may believe that processing ivory and rhino horns in Africa and shipping final or near-final products to demand markets helps them evade detection, since worked wildlife products are easier to carry, often difficult to identify as wildlife derivatives, and can be used to argue that traffickers are merely tourists, unaware of wildlife trafficking regulations.

Because processing seems to be moving closer to source and origin regions in Africa, air freight trafficking instances may fall, as fewer raw ivory shipments leave African airports for Asian destinations. Simultaneously, checked luggage and passenger trafficking instances may rise as worked ivory and processed rhino horn pieces or powder are increasingly moved instead. This is already visible in ivory seizure data

WILDLIFE PRODUCT PROCESSING INCREASINGLY OCCURS IN SOURCE REGIONS

TRANSPORT METHOD VARIES BY SPECIES

in the C4ADS Air Seizure Database, which shows a marked increase in worked ivory seizures in airports over the past couple of years. For example, worked ivory was found in 28% of ivory air instances in C4ADS's data in 2016, 54% in 2017, and 78% in 2018.

Few trafficking instances moved in passenger clothing or carry-on bags

Of all the world regions covered in this report, Africa had proportionally the fewest trafficking instances carried by passengers in their carry-on bags or on their bodies (11%), with the exception of Oceania, which counted none. If wildlife product processing continues to shift to source regions in Africa, however, seizures of worked wildlife products carried by passengers may increase.

TRANSPORT METHOD VARIES BY SPECIES

WILDLIFE PRODUCT PROCESSING INCREASINGLY OCCURS IN SOURCE REGIONS

“...wildlife product processing is increasingly occurring in source or origin countries, rather than near demand markets.”

IMAGE 4



Image 4. 2.04 kg of painted rhino horn pieces discovered inside the pockets and interlining of a passenger's jacket, as well as hidden in a pair of socks in his check-in bag in Hong Kong Airport. Source: Hong Kong Customs

EUROPEAN EEL TRAFFICKING NETWORKS

Over the past few years, known European eel trafficking instances appear to have spiked. Of the 21 European eel seizures in the C4ADS Air Seizure Database between 2016 and 2018, 5% occurred in 2016, 25% occurred in 2017, and 70% occurred in 2018. This is particularly concerning given that European eels are both endangered and generally trafficked in large quantities. In 2018 alone, C4ADS identified 14 seizures totaling around 3,757,000 eels.^{xvii}

Many of these European eel seizures exhibited similar characteristics, such as:

- Originated in Europe or Northern Africa, usually Spain, Portugal, or Morocco
- Destined for China or Vietnam
- Packed alive in plastic bags filled with water
- Transported in several specially adapted checked bags
- Transported in air freight and misdeclared as another marine species (e.g. prawns, chilled fish, octopuses)
- Involved tens or hundreds of thousands of eels
- Seized in Europe or Northern Africa

For example, in February 2018, Spanish Civil Guard agents discovered 250 kg of European eels in a shipment declared as barnacles in the air freight terminal of Madrid-Barajas Airport.^{xviii} The eels had been packed in several white Styrofoam boxes filled with water and ice in order to keep the eels alive until they reached their destination in Vietnam.



Image 5. European eels found in white styrofoam boxes by a Spanish Civil Guard. Source: Spanish Civil Guard

Two months later, in April 2018, the Spanish Civil Guard discovered another 600 kg of European eels hidden in a shipment declared as octopuses at Madrid-Barajas Airport.^{xix} The eels had once again been packed with bottles of ice in an attempt to keep the eels alive during transport to Hong Kong.

Other seizures involved a similar number of eels, but were hidden in checked bags carried by one to three traffickers instead of in air freight shipments. For example, on January 19, 2018, eight individuals were intercepted attempting to smuggle 317 kg^{xx} of eels packaged in plastic bags in 16 suitcases from Lisbon Airport to Vietnam.^{xxi} Similarly, on February 27, 2018, officials in Faro Airport arrested three Chinese men with 50 kg^{xxii} of eels in plastic bags in nine suitcases on their way to Vietnam.^{xxiii}

The consistent use of the same trafficking methods across different European eel seizures, as well as the sheer size of each trafficking attempt, suggest that European eel trafficking networks are well-organized and relatively professional. Investigations following several recent seizures have supported this indication and exposed the operations of small criminal groups specializing in European eel trafficking. For instance, in April 2018, the Spanish Civil Guard, the Portuguese Food and Economic Security Authority (ASAE), and Europol conducted a joint enforcement operation into one of these groups. During the operation, the officials coordinated the arrest of a group of ten Chinese, Spanish, and Moroccan nationals who had been trafficking European glass eels since at least 2016.^{xxiv} The network would fish for eels in northern Spain and then transfer the eels by truck to Algeciras, a Spanish city near the Strait of Gibraltar. The eels were then transported to Morocco where they would be flown to China, Hong Kong, or South Korea. The group also occasionally exported eels through Pato and Lisbon Airports.

Reports indicate that this modus operandi is common amongst eel trafficking groups:

"The live eels are largely caught...in Western Europe before being smuggled eastwards in vans or lorries, often falsely labeled as nonendangered fish... Criminal gangs then divide the eels into suitcases, up to 50,000 of the tiny fish per bag, which are then flown by commercial airliner to Asia. The fish are grown in special farms to their full size...and then sold to market."^{xxv}

All of these patterns seem to have continued into 2019. Between January and March of 2019, European officials had already made at least another eight European eel seizures, seven of which had been discovered in checked bags. Several of the seizures exhibited signs of organized, semi-professional trafficking activity.

For example, on February 6, Croatian officials in Zagreb Airport stopped two passengers, Chinese citizen Yeongjin Kim and Korean citizen Myeonghat Shin, with 252,000 European eels in plastic bags filled with water and ice in eight suitcases on their way to Moscow.^{xxvi xxvii} Airport officials had discovered the hidden eels after X-rays revealed what looked like "big balloons" in the bags, each of which had been lined with thermal padding to keep the eels at a steady temperature.^{xxviii} At the time of the seizure, Tihomir Zegrec, the head of Zagreb Airport's Border Customs Office, stated, "[The suspects] arrived in Zagreb a few days ago and their arrival was not unnoticed. They were in Croatia for a couple of days and then with their cargo they headed back to Moscow... The case has some elements of organized crime."^{xxix}



Image 6. One of the suitcases containing European eels seized in Zagreb Airport on February 6, 2019. Source: AP

EUROPEAN EEL TRAFFICKING NETWORKS

A subsequent investigation revealed that the suspects had already successfully delivered a shipment of European eels to their “employers” on January 24. During their later sentencing hearing, Croatian police explained that Kim and Shin had been hired by a “Mr. Han” (later identified as Chinese national Yongnan Han) to smuggle European eels from Zagreb to Southeast Asia. Han had greeted both suspects on their arrival in Zagreb and paid for both their flights and lodging expenses at two hotels. Han and his associate, Hanwool Jang, fled Croatia after the seizure.

Another 2019 seizure suggested that some European eel traffickers may have prior experience transporting fish. On January 28, customs officials in Stuttgart Airport stopped two men on their way to Asia with 170,000 European eels packed in 48 bags within four separate suitcases.^{xxx} Officials noted that the traffickers had added pure oxygen to each bag to increase the chances the eels would survive the journey. The Fisheries Commission “estimate[d] that a specialist in fish transport [was involved], because this is exactly how fish in commercial fisheries are transported.”^{xxxi}

The January 28 seizure was particularly notable because it was reportedly the first seizure of European eels in Stuttgart Airport. Reports of the seizure noted that although customs officials in Stuttgart had not dealt with European eel trafficking before, they were familiar with the “characteristics of eel smuggling” because eel seizures have become common in other European cities such as Frankfurt and Zurich.^{xxxii} A German official quoted at the time of the seizure suggested that higher seizure rates in Western Europe were pushing eel trafficking attempts further east towards Eastern Europe, “where eel smuggling is so far not that well-known and the detection rate is still relatively low.”^{xxxiii}

These seizures and associated arrests suggest that European eel trafficking is increasing, and tends to involve experienced, small-scale trafficking networks using European and North African airports to move eels to demand markets. As awareness of European eel trafficking continues to increase in European and North African airports, officials can expect to see a shift towards airports that are smaller or farther afield as traffickers attempt to bypass heightened scrutiny on high-risk flight routes.

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AMERICAS

MAIN TAKEAWAYS

Wildlife trafficking in the Americas primarily involved live animal trafficking, although there was a market in North America for certain wildlife products. For example, wildlife products derived from marine species were commonly exported from countries such as Mexico.

There was significant demand in Mexico for trafficked domestic species. This, coupled with the prevalence of the illegal totoaba trade, meant that Mexico was both the primary origin and transit country for wildlife trafficking in the Americas.

Traffickers moving finches from Guyana to New York in the United States tended to hide the birds in plastic hair curlers in their carry-on bags, sleeves, or socks. Since finch trafficking routes and methods tend to be consistent, customs and enforcement have an opportunity to use this information to search high-risk flights for finch trafficking attempts.

Domestic flights and domestic wildlife markets played a large role in wildlife trafficking in the Americas, especially within Mexico, Brazil, and Peru.

Unlike other world regions, the Americas stretch across the North-South Hemisphere boundary, and as such portrayed characteristics of both common origin and destination regions.

Wildlife trafficking activity by air appeared to be thinly spread across much of the Americas, with many countries occasionally publicly involved but only a couple with a significant seizure or trafficking instance count.

SOURCE REGIONS IN THE SOUTHERN HEMISPHERE, DEMAND REGIONS IN THE NORTH

FIGURE 1

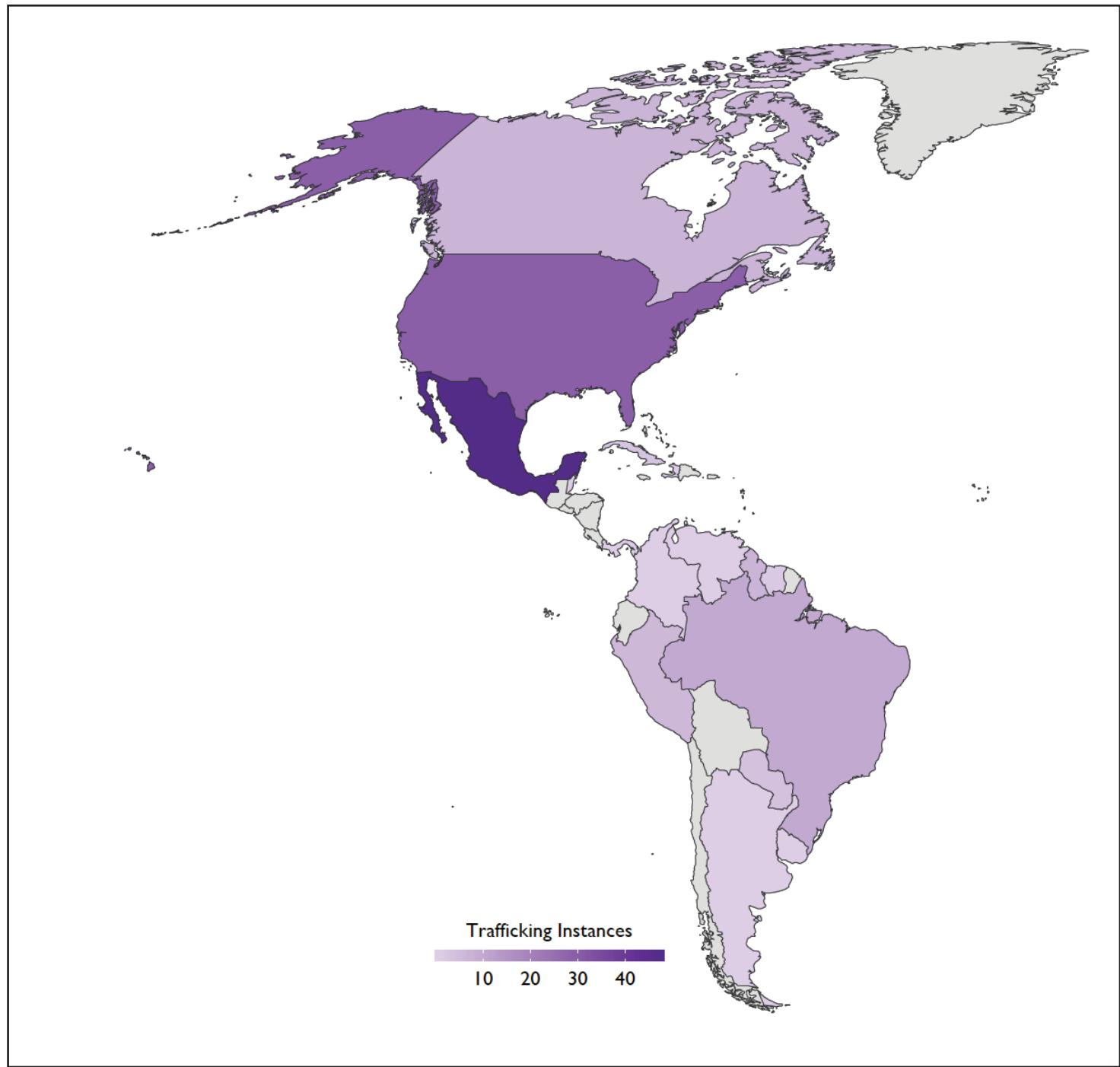


Figure 1. Heat map of wildlife and wildlife trafficking instances in the Americas' air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

The heat map for the Americas reflects the consolidation of wildlife trafficking instances in North American countries, which acted as destination points for certain species, transit points for wildlife leaving Central and South America and destined for sale in the Eastern Hemisphere, and, on comparatively rare occasions, as origin points for specific North American species (e.g. totoaba and box turtles).

Southern origin countries and northern destination countries

Unlike most other continents, the Americas straddle the Southern and Northern Hemispheres. In other world regions, wildlife trafficking destination countries are generally located in the north (Europe, Asia, the Middle East), while source and origin countries are located mostly in the south (sub-Saharan Africa). That trend is visible in the Americas as well, as North American countries in general had higher demand for internationally smuggled wildlife than most of their southern neighbors.

Importance of Mexico

Between 2016 and 2018, Mexico was often used as an origin, transit, and destination country by wildlife traffickers. Although Mexico appeared to have a domestic market for trafficked live animals, and was occasionally used as a transit point for wildlife leaving South America for the United States and China, Mexico's significance was primarily driven by high demand for certain native Mexican species in Asian and European marketplaces. Demand for the swim bladders¹ of the totoaba, a fish species that only lives in the Gulf of California in Mexico, was particularly significant. Totoaba bladders were often transported by air (via passengers' checked bags) and made up 24% of the trafficking instances involving Mexico in the C4ADS Air Seizure Database.

Seizures made in the Americas between 2016 and 2018 were less diverse than seizures made in other world regions over the same period, and primarily involved birds and marine species.

FIGURE 2

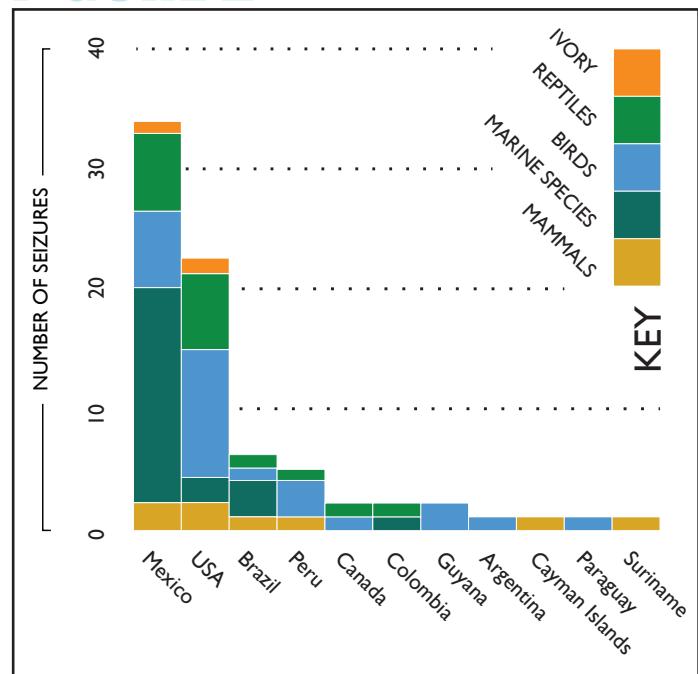


Figure 2. Total seizure count by American country (2016 – 2018)

FIGURE 3

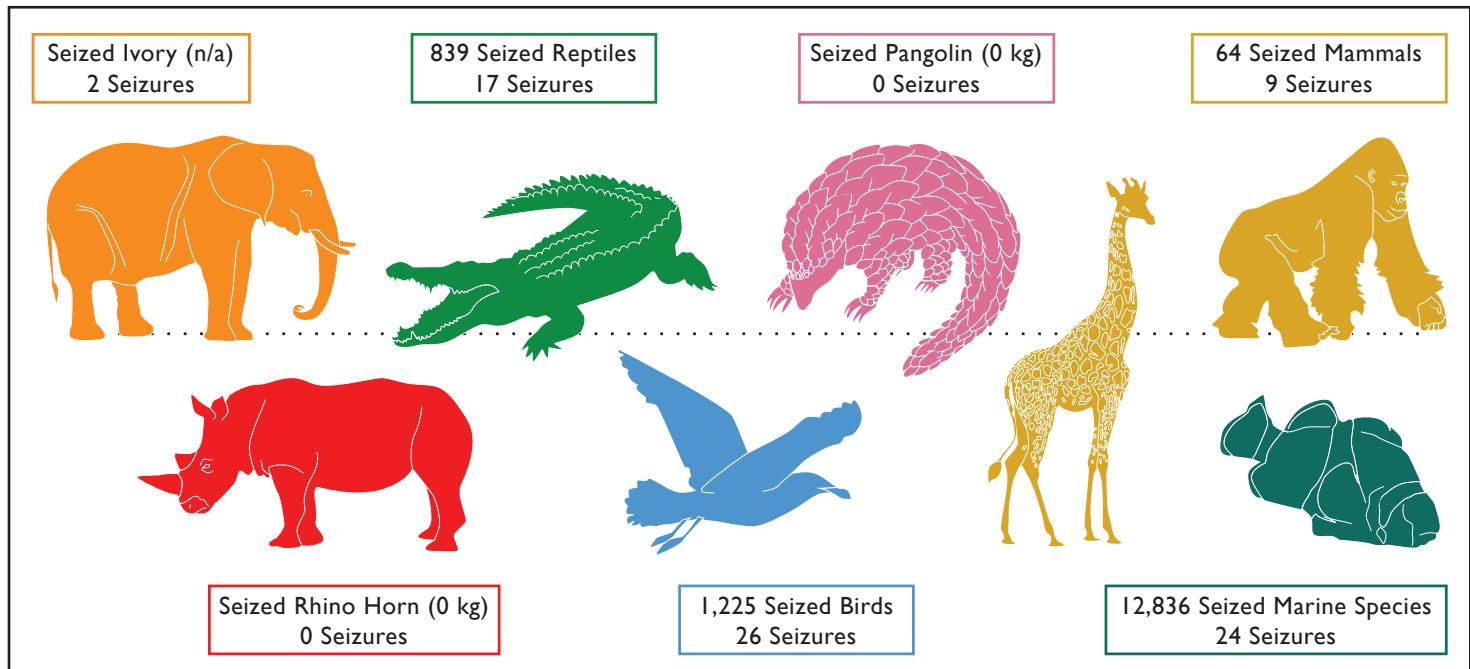


Figure 3. Number of American seizures displayed by type of wildlife or wildlife product seized (2016 – 2018)

¹A swim bladder is an organ used by certain fish species to regulate buoyancy.

Ivory seizures in the United States and Mexico

Although demand for most wildlife products in the Americas was either low or nonexistent in the C4ADS Air Seizure Database, Figure 2 does count two ivory seizures, one in the United States and the other in Mexico.

Ivory seizures in the United States, though comparatively infrequent, generally involve either small demand markets for ivory in certain US cities or tourists returning home from a trip abroad. In this particular instance, US Customs and Border Protection (CBP) agents were conducting routine checks on the luggage of a couple returning from the Philippines when an X-ray scan revealed something unusual in their bags.ⁱ The couple claimed they were bringing pickled mango home, but the agents found that they were carrying carved elephant ivory, hippo tusks, and warthog tusks.

IMAGE 1



Image 1. Two carved hippo tusks and two carved warthog tusks found in the luggage of a US couple returning from the Philippines in May 2018. Source: US Customs and Border Protection

SWIM BLADDERS, SEAHORSES, AND SEA CUCUMBERS

A 2018 seizure in Mexico City showcased the overlapping nature of marine species supply chains in the Americas, and highlighted the importance of China as a destination country for American wildlife products.

On July 19, 2018, federal authorities in Mexico City Airport detected a strong smell of fish emanating from a passenger's suitcase. After inspecting its contents, they discovered two bags containing 81 dried seahorses, two bags of dried sea cucumbers, and two bags of dried fish bladders.^{iv} The suitcase's owner, a dual Chinese-Belizean citizen, was on his way from Belize to Shanghai, China, which has become a common destination for marine species traffickers leaving Mexico after a direct flight was established between Shanghai and Tijuana in 2008.

After the seizure, the trafficker was arrested and put in preventative custody. The Mexican Federal Attorney for Environmental Protection

Ivory seizures in Mexico, however, are particularly unexpected, as there is little to no known demand market for ivory in the country. But analysis of the US Fish and Wildlife Service's (FWS) LEMIS database conducted for *In Plane Sight* (2018) may explain the seizure counted there in 2016; LEMIS shows Mexico as the primary exporting country of ivory seized in US airports, likely driven by flight routes originating elsewhere and connecting to the United States through Mexico.ⁱⁱ Wildlife traffickers may be aware that US customs officials inspecting inbound flights from Mexico will be more focused on narcotics and other contraband than on wildlife. In this particular seizure, ivory and coral objects were discovered by a courier company on the way to Texas in the United States.ⁱⁱⁱ

Significance of Mexico

Mexico's prominence in Figure 2 is primarily due to the illegal trade in marine species, which accounted for 18 (53%) of the 34 known wildlife seizures made by Mexican authorities in airports between 2016 and 2018. Of those 18 seizures, 17 involved either totoaba swim bladders (ten), sea cucumbers (seven), or seahorses (four). One seizure even involved all three.

Mexico also counted six bird and six reptile seizures between 2016 and 2018. Most of the seizures involved live animals that had originated in Mexico and were either seized prior to departure or were discovered as they transited through a Mexican airport on the way to their destination. But there was one clear distinction between Mexican bird and Mexican reptile trafficking: while 88% of the bird seizures were destined for Europe (primarily Spain – see **Spain & Bird Trafficking** in *In Plane Sight*), the only reptile seizures with listed destinations were flying to other Mexican cities. Two of the seizures involved only domestic Mexican flights, meaning they originated in, transited through, and were destined for three separate Mexican airports.

Similarly, Mexico made two mammal seizures in 2017 and 2018, both of which involved live cubs (two tigers and one jaguar) flying from Mexico City to other Mexican airports.



Image 2. Dried seahorses seized alongside totoaba bladders and sea cucumbers in Mexico City Airport in July 2018. Source: Enrique Castro-Mendivil, Reuters

(PROFEPA) recommended damage reparations of 477,081.46 pesos (US\$24,297).^v The suspect was later fined 134,682.6 pesos (US\$6,865), a quarter of the recommended fine, and prohibited from re-entering Mexico.^{vi}

LIONS, TIGERS, & REPTILES IN MEXICO

According to the C4ADS Air Seizure Database, Mexico experienced an unusually high number of domestic wildlife trafficking instances between 2016 and 2018. The volume of apparent domestic trafficking activity in Mexico suggests that there is demand in Mexico for certain wildlife species, although it is not immediately clear what drives it.

Many of the known domestic trafficking instances in Mexico between 2016 and 2018 shared certain characteristics. For instance, all of the instances involved either reptiles or mammals, most of which were live animals destined for the illegal pet trade. All of the shipments were also sent by air freight, usually accompanied by incomplete or illegible documents without recipient information, and often involved several different species. Many of the shipments contained potentially dangerous animals, like snakes, crocodiles, tigers, jaguars, or lions.

For example, on August 1, 2018, Mexican Federal Police seized an air freight package in Tijuana Airport that contained 10 Morelet's crocodiles (CITES Appendix I and II) and an emerald tree boa (CITES Appendix II).^{vii} The reptiles were sent from Mexico City and were concealed in three plastic containers.^{viii} A couple weeks later, on August 28, 80 green iguanas (CITES Appendix II) were discovered in two air freight packages using the same route, from Mexico City to Tijuana Airport. The shipment documentation for the iguanas was incomplete and listed incorrect species information.^{ix}

Big cat trafficking also seemed unusually prominent in Mexico between 2016 and 2018. For example, on June 15, 2017, Mexican Federal Police found a tiger cub in an air freight shipment in Tuxtla Gutiérrez Airport in Chiapas. The tiger had been sent from Mexico City.^x Almost a year later, on March 25, 2018, PROFEPA seized a tiger cub and a jaguar cub in Tijuana Airport that had also been trafficked via air freight from Mexico City.^{xi} The cubs were found when officials noted that documents meant to show the legal



Image 3. Tiger cub shipped from Mexico City to Chiapas via air freight and seized on June 15, 2017. Source: El Gráfico

provenance of the cubs were inconsistent. Other shipment documents were illegible, and did not include sender address or recipient information.^{xii}

Finally, on October 1, 2018, Mexican Federal Police heard "roars" emanating from a wooden box labeled "live animals" during a review of air freight shipments for a commercial airline in Tijuana Airport.^{xiii} Mexican officials opened the box and discovered a two-month-old lion cub inside. Airline employees provided officials with two documents for the cub, one of which was actually a permit for a Bengal tiger. The other document did not comply with Mexico's General Wildlife Law. The cub was also not microchipped as required.



Image 4. A lion cub discovered in a wooden box in Tijuana Airport. Source: PROFEPA

Similar big cat seizures have also occurred in Mexico outside of the air transport sector. For example, on February 4, 2018, a sniffer dog with the Mexican Federal Police discovered a sedated tiger cub inside a plastic container at a truck stop in Jalisco.^{xiv} The cub was due to be sent by mail to Queretaro in central Mexico.



Image 5. The tiger cub found on February 4, 2018 in Jalisco, Mexico. Source: Reuters

The same week, the Mexican Federal Police reportedly found another tiger cub due to be shipped by a postal company in Xoxocotlan, as well as a jaguar abandoned in a cage near a road in Chihuahua.^{xv}

Taken together, these seizures indicate that demand for exotic pets in Mexico is significant, although they do little to explain where demand for these animals might be coming from.

Mexican social media accounts, however, provide a few clues. Like the ultra-rich of the Middle East, some Mexican narcotraffickers seem to flaunt their wealth online by purchasing exotic, often dangerous animals and posting the evidence on their social media accounts.^{xvi} For example, Damaso Lopez Serrano, the godson of infamous narcotrafficker El Chapo, frequently posted images of weapons, drugs, and tiger cubs he kept as pets on Instagram.^{xvii} Some Mexican narcotraffickers are even known to maintain their own small-scale "zoos," housing big cats, monkeys, and snakes on their properties.^{xviii} According to one Mexican official, "[The animals] are a status symbol. The people who acquire them are people with lots and lots of money, and other illegal practices are often going on there as well."^{xix}

Mexican narcotraffickers' preference for exotic wild animals is aided by lax legislation in the country. In general, Mexicans are legally allowed to own wild animals as long as the animal is captive-bred and the owners acquire a permit from the Mexican Secretariat for the Environment and Natural Resources (Semarnat), microchip the animal, and provide assurances that it will be well-

LIONS, TIGERS, & REPTILES IN MEXICO



Images 6 and 7. Mexican narcotraffickers post exotic animals kept as pets on social media profiles as a display of their wealth. Sources: Instagram/Sinaloa.Guasave and Central European News

cared-for. The price of the animals tends to be relatively low (in the low thousands of dollars), essentially meaning any relatively well-off Mexican citizen can at least purchase an exotic wild animal, even if they cannot afford to care for the animal long-term.

In 2016, an employee at the Guadalajara-based pet store Exotic Planet told a reporter that “We have brought in everything from lemurs to lions. They cost 75,000 pesos (US\$4,150) each.”^{xx} The owner of the store stressed the legality of the exotic pet trade in Mexico, stating that if the animals “have been brought up in captivity, [and] the rules have been followed, there is no problem.”^{xxi} The owner referenced breeding centers for dolphins, iguanas, deer, tarantulas, and lions in Mexico, saying, “It’s like oil. It is all exported to the United States.”^{xxii} A tiger cub seizure on the US-Mexico border in August 2017 appeared to support this idea; the cub was being driven over the border by a teenager who had reportedly been boasting about selling tigers, jaguars, and lions from Mexico in the United States.^{xxiii}

Mexico’s lax exotic wildlife legislation seems to support a significant market for exotic wild animals in the country, giving traffickers an opportunity to hide under the guise of legal compliance whilst shipping animals illegally within Mexico and abroad.



Image 8. A tiger cub found in the car of an apparent wildlife trafficker operating between Mexico and the United States. Source: US CBP

IMAGE 9



Image 9. A tiger cub and jaguar cub that were discovered in an air freight package in Tijuana Airport with illegible and incomplete documentation. Source: Profepa

Appearance of the Amazon

Five of the countries in Figure 2 – Brazil, Peru, Colombia, Guyana, and Suriname – all contain pieces of the remarkably diverse Amazon rainforest, and so may be targets for wildlife traffickers. Given the abundance of biodiversity present in each country, it is somewhat surprising that only 16 known seizures occurred in their airports between 2016 and 2018. It seems even more likely that wildlife trafficking in these countries is underrepresented in Figure 2 when well-known wildlife markets in the area are considered. For instance, the large, well-known Belén market in Peru's riverside city, Iquitos, specializes in selling bushmeat and live animals like parrots, tapirs, baby monkeys, and baby manatees.

There are a few possible reasons these Amazonian countries do not appear more prominently in the data. First, wildlife trafficking in the region often occurs by boat, given the remote, inaccessible nature of much of the rainforest. Furthermore, as one Iquitos trafficker explained, airport security makes it hard to traffic animals by airplane, so many are taken upriver to Pucallpa, and then are driven to Peru's Pacific coast.^{2xxiv} Second, awareness of wildlife trafficking in international and domestic airports in the region appears to be low, and even where it is not, seizing trafficked live animals and wildlife products seems to be low priority.

Third, screening for domestic departures and arrivals is often less rigorous than screening for international travel, further diminishing the chances that trafficked wildlife will be discovered, since much of South American wildlife trafficking occurs domestically. Finally, reporting of airport seizures does not appear to be as common in and around the Amazon as it is in other world regions, perhaps artificially deflating the apparent frequency of wildlife trafficking in the area.

“IMPORTANCE OF SEIZURE REPORTING & ITS EFFECT ON APPARENT ENFORCEMENT SUCCESS

²That same trafficker, however, also described taking orders from zoos, saying that one group in particular would fly into Iquitos on a private plane, presumably to pick up their purchased animals.

Source: <https://news.mongabay.com/2016/12/wildlife-for-sale-an-illegal-activity-out-of-control-in-peru/>

BELÉN MARKET

A large market for trafficked wildlife can be found in the “floating city” of Belén, located on the outskirts of Iquitos, Peru, where vendors openly flout laws against the sale of bushmeat and wild animals.^{liv} In this sprawling marketplace, the animals on offer include vulnerable species such as the South American tapir and yellow-footed tortoise.^{xxv}



Image 10. Two jaguar pelts for sale in Belén, Peru. Locals consider jaguars a threat. Source: Eduardo Franco Berton

International demand has exerted a growing influence on the market’s offerings in recent years. A recent investigation by local journalists found that jaguar products, prized by Chinese buyers, have been in especially high demand. Over the span of a week, the journalists found a large number of jaguar (CITES Appendix I) products for sale in the market, including four skulls, five pelts, 44 fangs, and 70 claws, as well as at least six turtles, a titi monkey, and boa constrictor meat.^{xxvi}

Knowing that their primary customers are tourists, market vendors often offer to help buyers smuggle their purchases past airport customs and enforcement.^{xxvii} One vendor explained, “We take dried leaves and wrap [the jaguar fangs] ... And we teach [the buyers] that they have to hide them in the middle of their clothes [in their suitcase]. We have had to do this several times, because if customs finds [the fangs] they will take them.”^{xxviii}

However, despite clear wildlife trafficking activity and well-designed Peruvian counter-wildlife trafficking laws,^{xxix} no one has been jailed for wildlife trafficking in Peru, according to Yovana Murillo of the Wildlife Conservation Society (WCS).^{xxx} Some authorities hesitate to intervene in what they see as a local tradition, or because of the personal risk involved; according to locals, when a law enforcement official enters the Belén market, “all the vendors unite ... and don’t let [the official] leave.”^{xxxii}

Furthermore, countless diffuse transportation routes in the Amazon present a significant challenge for authorities working against wildlife trafficking in the area. According to one local authority, “although there are ports of control and customs, the magnitude of ports in the Amazon makes [wildlife trafficking] much more difficult to control.”^{xxxii}

Note that wildlife markets similar to Belén exist elsewhere in the Amazon as well, particularly in Brazil and Bolivia, amplifying the risk to Amazonian wildlife.^{xxxiii} Vendors’ reports of increasing demand for wildlife in these markets, coupled with vendors’ willingness to advise buyers on the best way to smuggle their illegal purchases through airport screening, strongly suggest that wildlife trafficking by air in South America is under-acknowledged or under-reported by South American authorities.

FIGURE 4

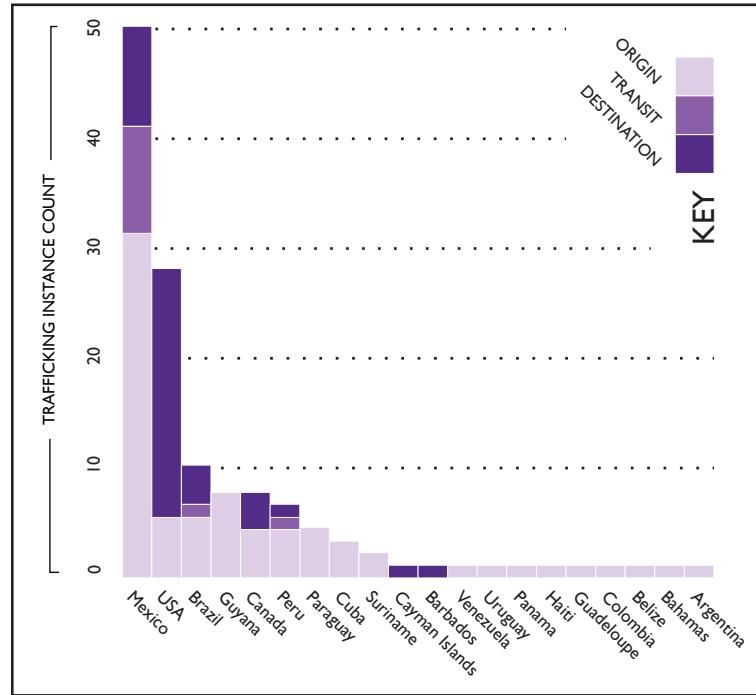


Figure 4. Country-level flight route information for American countries with one or more trafficking instance (2016 – 2018)

FIGURE 5

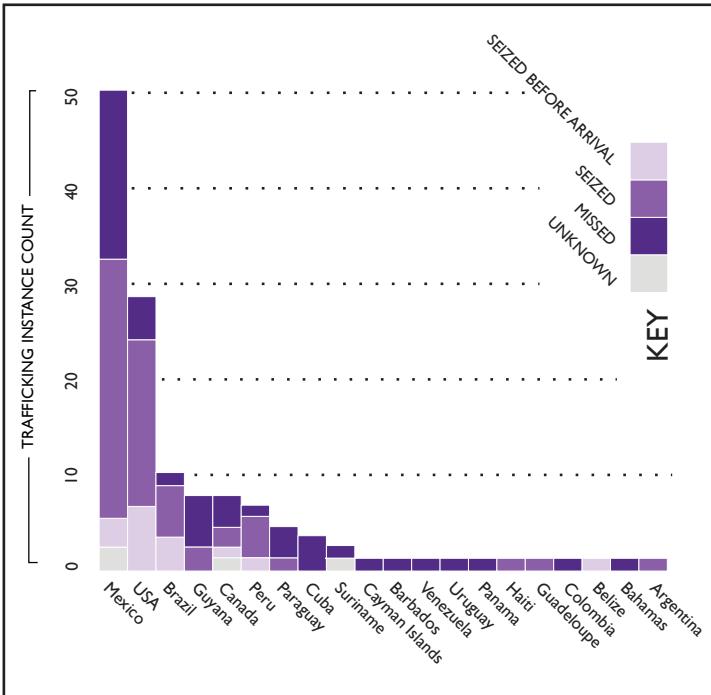


Figure 5. Point of seizure within the supply chain by American country (2016 – 2018)

Wildlife trafficking by air in the Americas appears to be thinly spread across many American countries, really concentrating in only two: Mexico and the United States.

Prominence of Mexico

Mexico counted far more wildlife trafficking instances between 2016 and 2018 than any other American country according to the C4ADS Air Seizure Database, with more origin instances alone than the United States' total trafficking instance count. A number of Mexican species are in high demand in other world regions, such as totoaba (see **New Flight Routes, Organized Crime, & Totoaba** in *In Plane Sight*), sea cucumbers, and various bird species (see **Spain & Bird Trafficking** in *In Plane Sight*). Totoaba in particular is in demand in China, where one totoaba bladder can sell for as much as US\$250,000.^{xxxiv} Totoaba seizures appear to be increasing; although Mexican officials made only one known totoaba seizure in an airport in 2017, they made eight in 2018, reflecting either an increase in trafficking activity, enforcement awareness, or public seizure reporting. Of those nine total seizures, four both originated in and transited through Mexico, usually Mexico City, before flying internationally.

Mexico also experiences an unusually high rate of domestic wildlife trafficking, with traffickers smuggling in-demand species from one Mexican airport, through another Mexican airport, to a third Mexican airport. For example, in February 2018, Mexican officials discovered multiple shipments of reptiles and tarantulas from Monterrey and Nuevo Leon on the Estafeta parcel platform in San Luis Potosí Airport.^{xxxv} The packages contained 18 animals (some protected native Mexican species and some protected foreign species), and were addressed to locations in seven different Mexican cities.³ The diversity of species involved and the wide array of intended destinations suggest that these animals may have been ordered from a reptile trader or traders in Monterrey and Nuevo Leon. Exotic mammal seizures (e.g. tigers and lions) within Mexico also suggested the involvement of live animal traders, although mammal shipments within Mexico often lacked detailed destination information, likely to protect buyers.

The United States as a destination country

The United States is one of only three countries in Figure 4 that were primarily destination points for wildlife trafficking instances. Between 2016 and 2018, the United States was the intended destination for a variety of ivory (two), reptile (seven), bird (12), marine species (four), and mammal (two) seizures, according to the C4ADS Air Seizure Database. The ivory, marine species, and mammal trafficking instances generally involved multiple different types of wildlife products (e.g. ivory and coral) on the way to specific recipients or small demand markets. The bird and reptile instances, in contrast, usually involved live animals intended either for the pet trade or for finch singing competitions in New York (see **Hair Curlers from Guyana** in *Flying*

IMAGE 10



Image 10. Birds smuggled in plastic hair curlers hidden in a fanny pack and "in the groin area" of a trafficker flying between Havana, Cuba and Miami in the United States. Finches are also smuggled into the United States in hair curlers. Source: US Customs and Border Protection

Under the Radar (2017)).

Although the United States was primarily a destination country, it was also occasionally an origin point. A number of the trafficking instances associated with the United States in the C4ADS Air Seizure Database appeared to involve individual animals smuggled by traders to be sold as pets elsewhere. Other trafficking instances included 962 whitetip shark fins found in the luggage of Indonesian fishermen flying home from Hawaii, and a shipment of dried totoaba bladders flying from Los Angeles to Hong Kong.^{xxxvi} In the latter example, the totoaba bladders were almost certainly dried near the US-Mexico border and then driven to Los Angeles, perhaps to avoid officials more familiar with totoaba trafficking in San Diego and northwestern Mexico. trafficking in San Diego and northwestern Mexico.

Guyanese bird trafficking

Despite its small size, Guyana is the second-most common origin country in Figure 4. All of Guyana's eight trafficking instances involved finches ultimately destined for New York. Only two of the eight were stopped in Guyana, even though flights from Guyana to New York are known to be high-risk for finch trafficking attempts.⁴

Finch trafficking between Guyana and New York occurs frequently enough that it accounted for 50% of the bird trafficking instances destined for the United States in the C4ADS Air Seizure Database between 2016 and 2018. Recent reporting also suggested that these trafficking instances account for only a few of the finch seizures made by US enforcement authorities over the past few years; in December 2018, CBP officers stated that they had made at least seven finch seizures in JFK Airport in 2018, totaling 184 finches.^{xxxvii} In comparison, the C4ADS Air Seizure Database counts four seizures in 2018 totaling 124 birds.

³The shipments included nine ball pythons (CITES Appendix II), an Egyptian sand boa (CITES Appendix II), a Cooke's tree boa (CITES Appendix II), a Meller's chameleon (CITES Appendix II), a crested gecko, a red-eared slider turtle, an alligator snapping turtle (CITES Appendix III), and a spiny lizard, as well as two tarantulas. The animals had arrived from Monterrey and Nuevo Leon and were addressed to Queretaro, Guanajuato, Sinaloa, Mexico City, Quintana Roo, Jalisco, and Hidalgo.

⁴See **Hair Curlers from Guyana** in *In Plane Sight* (2017) for more information.

Low seizure rates

Many American countries missed most of the known wildlife trafficking instances passing through their airports (e.g. Guyana, Paraguay, Cuba, Venezuela, Panama, Uruguay, Guadeloupe, Haiti, Belize, and the Bahamas).

SNAKE ON A PLANE

In July 2018, a Transportation Security Administration (TSA) officer in Miami Airport noticed an “organic mass” inside a computer tower in the suitcase of a female passenger destined for Barbados. Further inspection by a TSA bomb expert revealed the “mass” to be a ball python, prompting TSA spokesperson Sari Koshetz to remark that, “...the interception [of the ball python] did prevent a possible wildlife threat on an aircraft. Animals of many species have been known to escape and chew through wires with fatal results.”^{xxxviii} Koshetz’s comment exposed the dangers associated with having a wild animal of any species loose in the cargo hold during flight.



Image 11. A ball python hidden in a computer tower. Source: US TSA

THE CAYMAN ISLANDS & THE ILLEGAL WILDLIFE TRADE

A 2017 seizure revealed a possible small-scale wildlife trafficking operation illegally importing animals from other countries into the Cayman Islands. Note that island nations are particularly vulnerable to invasive species since native wildlife are naturally isolated, and have not evolved to compete with many other animals.

In June 2017, officials in Owen Roberts Airport in the Cayman Islands confiscated a sugar glider that had escaped from a passenger’s carry-on bag on Cayman Airways flight KX 107 from Miami.^{xxxix} Two people traveling with the sugar glider were arrested.

During a subsequent investigation, customs officials discovered other exotic animals, including snakes and a lizard, at a couple of properties associated with the passengers. They also arrested a third individual on drug-related charges at one of the properties. One of the three suspects was allegedly a close relative of a

member serving in the Legislative Assembly of the Cayman Islands at the time.^{xl}

While sugar gliders are legal to own in Florida, anyone attempting to import one into the Cayman Islands would, at a minimum, need a permit from the Department of Agriculture. After the seizure, Frederic Burton, the Department of Environment’s terrestrial resources manager, expressed concern about the incident, stating, “Escaped pets are the start of so many environmental nightmares. ... [Sugar gliders are] a tropical/subtropical species, from the opposite hemisphere. [They were] introduced from Australia to Tasmania, so [are] capable of being invasive and can deal with a wide range of climates.”^{xli}

FIGURE 6

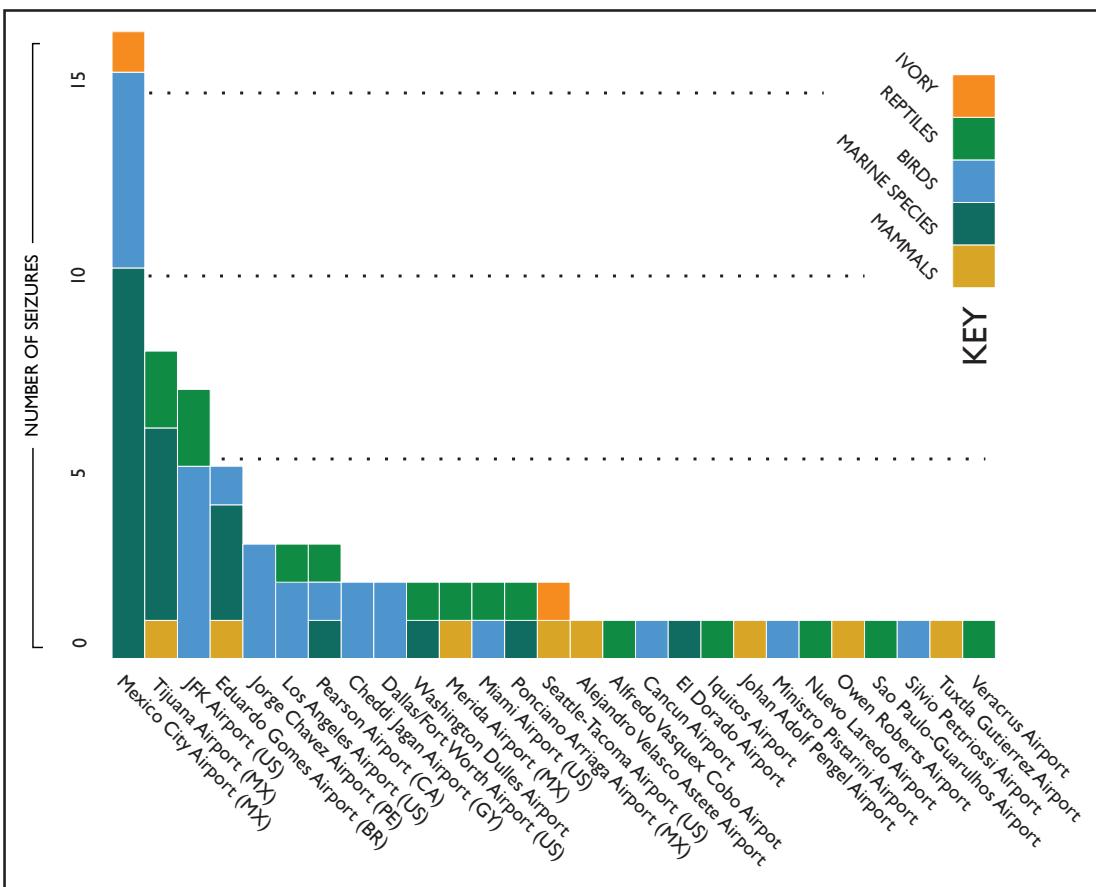


Figure 6. Airport seizure count for American airports (2016 – 2018)

Similar to Figures 2, 4, and 5, the American airport seizure count emphasizes how widely and thinly spread known wildlife seizures are in the Americas, with 48% of American airports in the C4ADS Air Seizure Database counting only one wildlife seizure.

Many Mexican and U.S. airports

Although known wildlife seizures in the Americas were widely distributed across a variety of airports between 2016 and 2018, seizures did concentrate in two countries: Mexico and the United States. Mexico counted 33 seizures in eight airports – Mexico City Airport, Tijuana Airport, Merida Airport, Ponciano Arriaga Airport, Cancun Airport, Nuevo Laredo Airport, Tuxtla Gutierrez Airport, and Veracruz Airport – between 2016 and 2018 in part because a number of Mexican airports offer international flights to Europe and Asia, and in part because domestic wildlife trafficking in Mexico frequently exploits the air transport sector. This means that both international and smaller, regional airports in the country are at risk of exploitation.

Although the United States counted fewer seizures (20 in

SUPPLY CHAINS NARROW AS THEY REACH THEIR DESTINATION

total) than Mexico, those seizures were spread throughout six different airports: John F. Kennedy Airport, Los Angeles Airport, Dallas/Fort Worth Airport, Dulles Airport, Miami Airport, and Seattle-Tacoma Airport. All of these airports are significant international hubs connecting travelers to Asia, Europe, Africa, and Latin America.

Effects of totoaba trade are visible

The prevalence of the totoaba trade is visible in the high seizure counts of Mexico City Airport and Tijuana Airport. Both airports counted more known wildlife seizures between 2016 and 2018 than any other airport in the Americas according to the C4ADS Air Seizure Database, and both seized marine species more frequently than any other type of wildlife, with a combined 16 marine species seizures out of 26 total seizures. Tijuana Airport's significance is likely due to a nonstop Aeromexico flight from Tijuana to Shanghai, which is particularly vulnerable to exploitation by totoaba traffickers, as well as its status as the largest international airport in Baja California (see **New Flight Routes, Organized Crime, & Totoaba in In Plane Sight**).

FIGURE 7

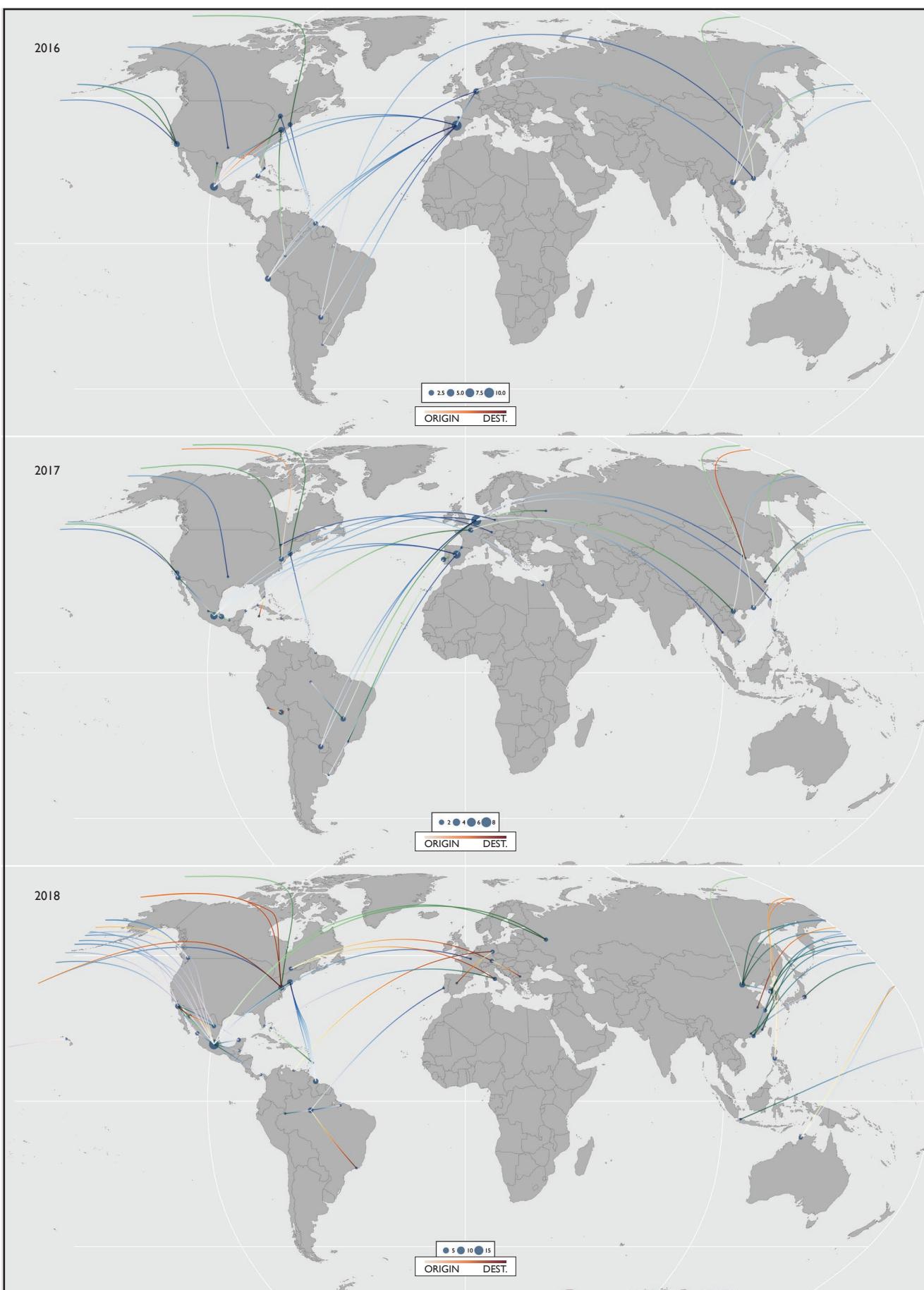


Figure 7. American air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city. Capital cities are used when specific airports are unavailable.

UNUSUAL ROUTES

BRAZILIAN AQUARIUM FISH

Two large seizures of aquarium fish in Manaus, Brazil in 2017 and 2018 suggested that aquarium fish trafficking may be more prevalent than it seems, and highlighted a frequent smuggling route between Brazil and Colombia.

The first seizure took place in October 2017 in Eduardo Gomes Airport in Manaus, when Brazilian officials discovered Jhon Batalha Coelho and Leandro Martins dos Santos with 672 live fish in plastic bags in three suitcases.^{xlii} At least two of the species seized were not known to science; one species (zebra pleco catfish) was endangered and listed on CITES Appendix III; and a number of the fish, including two stingrays, later died as a result of injuries sustained during the trafficking attempt. All of the species had come from the Xingu River Basin.



Image 12. Three suitcases carrying 672 live aquarium fish in Manaus, Brazil in October 2017. Source: Brazilian Federal Police

Coelho and dos Santos were trying to fly to Tabatinga, Brazil, an Amazonian city on the border with Peru and Colombia. Seizure reports at the time stated that the men likely intended to cross the border into Colombia, "today the main smuggling route for Brazilian ornamental fish."^{xliii} They were fined roughly

US\$375,000 each and were charged with environmental crimes and attempted smuggling.

Less than a year later, Brazilian Federal Police discovered another 550 aquarium fish, some of which were endangered species, in Eduardo Gomes Airport in Manaus.^{xliv} Similar to the first seizure, the fish had been hidden in plastic bags in two suitcases. Brazilian authorities arrested two traffickers traveling with the fish who were attempting to fly to Tabatinga. Both suspects were charged with environmental crimes.



Image 13. Two suitcases carrying 550 live aquarium fish in Manaus, Brazil in July 2018. Source: Brazilian Federal Police

Both seizures involved a large number of aquarium fish hidden in plastic bags placed within suitcases and destined for Tabatinga, on the border with Colombia. Both were also accompanied by two traffickers. These similarities suggest that these seizures may be evidence of a network of organized traffickers moving aquarium fish from the Amazon to a demand market in Colombia, which has "a large market in Japan and other rich countries [sic]." At the very least, two similar seizures involving so many fish within one year reveal a common trafficking route and represent a threat to the survival of endangered fish species in Brazil.

A totoaba seizure in the summer of 2018 did not exhibit any of the usual characteristics of totoaba trafficking, suggesting that traffickers may be shifting to new methods to try to avoid attentive enforcement officials in certain airports.

On August 8, 2018, Mexican publication Excelsior reported the seizure of 16 dried totoaba swim bladders found in a postal package in Mexico City Airport. The bladders were discovered by federal authorities among a shipment of fish products—including 6.25 kg of fish bladders from an unidentified species—originating from Hermosillo, Mexico and bound for New York.^{xlv} With a combined weight of 1.27 kg, the seized totoaba bladders had an estimated total value between US\$25,400 and US\$101,600.^{xvi}

The seizure was unusual for several reasons. First, most totoaba trafficking attempts fly out of Baja California on the way to China, the primary demand market for the bladders. This shipment left from Hermosillo in Sonora, the Mexican state to the east of Baja California, and was destined for New York, which has no known demand market for totoaba bladders. The unusual origin location of the shipment may reflect an attempt to evade enforcement authorities in Baja Californian airports that are familiar with totoaba. New York's appearance is particularly unexpected, but could suggest that JFK Airport is an unusual transit point for totoaba. Second, totoaba bladders are generally moved in checked luggage, but this shipment



Image 14. Fish swim bladders from an unidentified species discovered with totoaba bladders. Source: Ernesto Méndez

was discovered in a postal mail parcel. This change may indicate an attempt to switch methods to avoid checked luggage screening and circumvent Mexican officials familiar with totoaba trafficking patterns. This possibility seems fairly likely, given that an earlier totoaba shipment discovered in Mexico City Airport in July 2018 was also found in a mail parcel.

The American routes maps both emphasize the prevalence of intra-regional wildlife trafficking in the Americas and highlight the importance of Europe and Asia to American trafficking routes.⁵

Increase in known flight routes in 2018

There appeared to be a relatively substantial increase in American trafficking instances in 2018, primarily due to an increase in marine species and mammal seizures. Marine species trafficking instances grew from three in 2016, to four in 2017, to 24 in 2018, usually involving either totoaba swim bladders or sea cucumbers. Mammal trafficking instances grew more modestly, from none in 2016, to four in 2017, to 11 in 2018.

Bird trafficking to Europe

One of the clearest trends visible in the routes maps involved bird trafficking instances moving from the Americas to Europe, usually Spain, in 2016 and 2017. The 2018 routes map reveals an apparent decline in bird trafficking instances destined for Spain, which may be the result of a late 2017 operation led by Spanish authorities to dismantle a bird trafficking network based in Álava, Spain (see **Spain & Bird Trafficking** in *In Plane Sight*). Still, at least two bird trafficking instances left Mexico and Brazil for France and Portugal in 2018, one of which seemed somewhat similar to the earlier trafficking instances associated with the Spanish syndicate (e.g. wide variety of bird species, birds kept in boxes or cages inside checked luggage, accompanied by one trafficker).^{xlvii}

Europe cedes to Asia as most common transit and destination point for American trafficking instances

In 2016 and 2017, most documented American wildlife trafficking instances leaving the Americas either flew directly to European destinations, or flew through a European airport before flying to Asia or another European country. But in 2018 that trend seemed to reverse; wildlife trafficking instances destined for or transiting through Europe seemed to decrease, while trafficking instances destined for or transiting through Asia seemed to increase significantly.

Domestic flights in Mexico, Brazil, and Peru

Domestic wildlife trafficking by air is comparatively common in the Americas according to the C4ADS Air Seizure Database, with domestic flight routes most clearly visible in Mexico, Brazil, and Peru in 2017 and 2018. Mexico counted the most domestic flight routes in the Americas by far. As discussed previously, Mexican domestic trafficking attempts generally involved either totoaba passing through a second Mexican airport before flying to Asia, or domestic demand for exotic live animals, such as reptiles, birds, or big cats (see *Tigers in Mexico*).

Domestic wildlife trafficking by air in Brazil usually involved traffickers moving live animals, such as birds, turtles, or aquarium fish, from remote areas of the Amazon to urban areas, either to sell them in

IMAGE 15



Image 15. A male passenger found with 32 eggs wrapped around his torso in Eduardo Gomes Airport in Manaus. Source: Brazilian Federal

local markets or to connect to an international flight route in order to export them. For example, in May 2018, Brazilian officials in Eduardo Gomes Airport in Manaus discovered 32 eggs placed in stockings and wrapped around a male passenger's torso.^{xlviii} He had arrived in Manaus from Belém (known as the gateway to the Amazon River), and was attempting to fly to Lisbon, Portugal when he was discovered.

The C4ADS Air Seizure Database contains only one domestic Peruvian trafficking instance between 2016 and 2018, which may suggest that this is an overlooked type of trafficking in Peru given known wildlife markets in the country (see **Belén Market**). In April 2017, Peruvian officials discovered a baby capuchin monkey in the luggage of a female passenger connecting through Alejandro Velasco Astete in Cusco on her way to Lima.^{xlix} She had just arrived from Padre Aldamiz Airport in Puerto Maldonado, Peru.

IMAGE 16



Image 16. A baby capuchin monkey discovered being smuggled through Cusco, Peru. Source: SERFOR

⁵Although the C4ADS Air Seizure Database contains few wildlife trafficking instances flying between the Americas and Africa or the Middle East, C4ADS analyzed more extensive wildlife seizure data (2009 – 2016) from the US Fish and Wildlife Service's Law Enforcement Management Information System (LEMIS) for ROUTES's 2018 report, *In Plane Sight*. LEMIS import data (seizures of wildlife imported into the United States) in general support the trend visible in the American routes maps – comparatively few wildlife trafficking instances from Africa and the Middle East were stopped on arrival in the United States (Nigeria was the only African country listed among the top countries for imported wildlife by seizure count). However, LEMIS did count a substantial number of wildlife trafficking instances flying between Africa, the Middle East, and the Americas, so much so that Saudi Arabia, Qatar, the UAE, Kuwait, and Bahrain all appeared as common destination countries for wildlife trafficking attempts seized by US officials on departure. See **Appendix II: FWS LEMIS Seizure Data (2009 – 2016)** in *In Plane Sight* (2018) for more information.

FIGURE 8

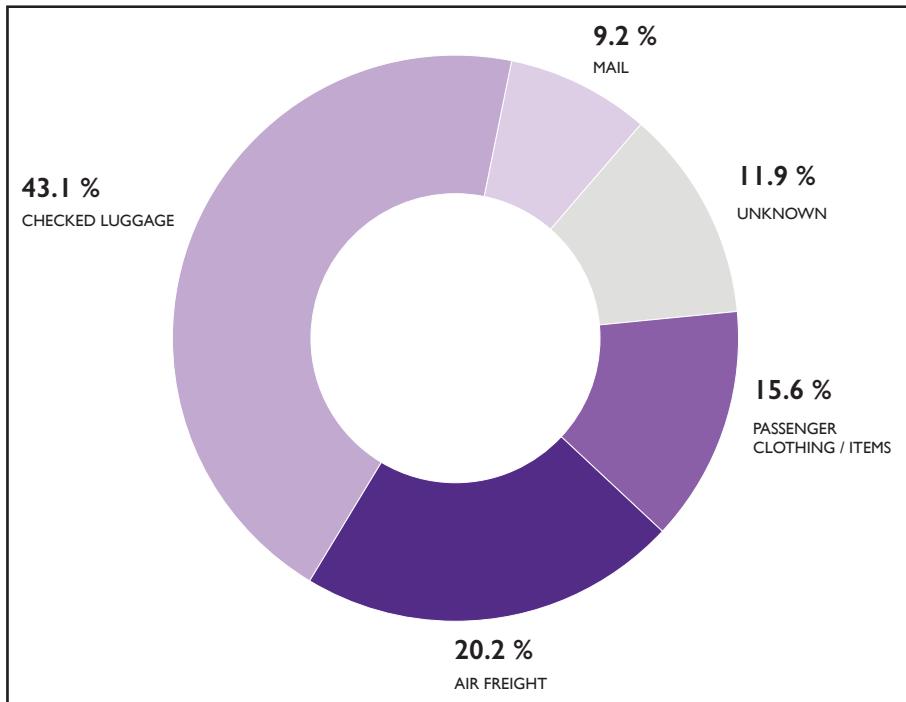


Figure 8. Transport methods for American trafficking instances in the air transport sector (2016 – 2018)

As in other world regions, checked luggage was the most common transport method used by wildlife traffickers in the Americas between 2016 and 2018, accounting for just under 50% of American wildlife trafficking instances (43%).

Unusually high number of air freight instances

Generally, regions that experience more live animal trafficking activity see more trafficking instances moved in checked luggage and in passengers' clothing or carry-on items than in air freight. Even though wildlife traffickers in the Americas relied on air freight slightly less often than traffickers in common wildlife product regions Africa, Asia, or the Middle East between 2016 and 2018, American trafficking instances were still moved in air freight roughly a quarter of the time (20% compared to Asia's 21%).

Most of the American wildlife trafficking instances moved in air freight between 2016 and 2018 appeared to be linked to Mexico, and generally contained sea cucumbers likely destined for consumption or reptiles destined for homes in Mexico or the United States. Other Mexican air freight instances involved big cat cubs and flamingos sent with fraudulent and incomplete documentation.

High number of mail instances

Although mail seizures appeared to be relatively infrequent in Figure 8, 10% of American wildlife trafficking instances were discovered in mail shipments. This could reflect more attentive and effective screening practices for mail shipments in the Americas.

American mail trafficking instances generally involved wildlife products, often mammal skulls or skin shipped from American countries to Europe, or totoaba bladders hidden in mail shipments. The use of mail as a transport method for totoaba is slightly unusual, however, since dried totoaba bladders moved by air are usually found hidden within checked bags. The appearance of totoaba trafficking instances sent via mail in 2018 could reflect either an attempt by traffickers to circumvent enforcement, or enforcement proactively searching mail shipments in response to an apparent increase in trafficking activity.

TRANSPORT METHOD VARIES BY SPECIES

WILDLIFE TRAFFICKING BY MAIL LIKELY UNDERREPRESENTED

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ASIA

MAIN TAKEAWAYS

Asia is by far the world's largest demand region for trafficked wildlife and wildlife products.

Asian trafficking routes extend to every region, sourcing live animals and wildlife products from all over the world.

China dominated every seizure and trafficking instance count in the analysis, likely due to extremely high demand for trafficked wildlife driven by a large population, effective enforcement, and good reporting.

Trafficking of Asian species has declined as their population numbers have fallen, and Asian trafficking networks appear to increasingly rely on species found mostly in Africa to satiate demand.

Although Asian species are in decline, sufficient numbers remain to support significant intra-Asian trade in reptiles, birds, pangolins, and marine species. Ivory, rhino horn, and mammal products are also trafficked intra-regionally, perhaps supported by wildlife demand markets throughout East and Southeast Asia that import from other world regions and trade amongst themselves.

Reptile trafficking in Central and Southeast Asia, however, is still widespread.

FIGURE 1

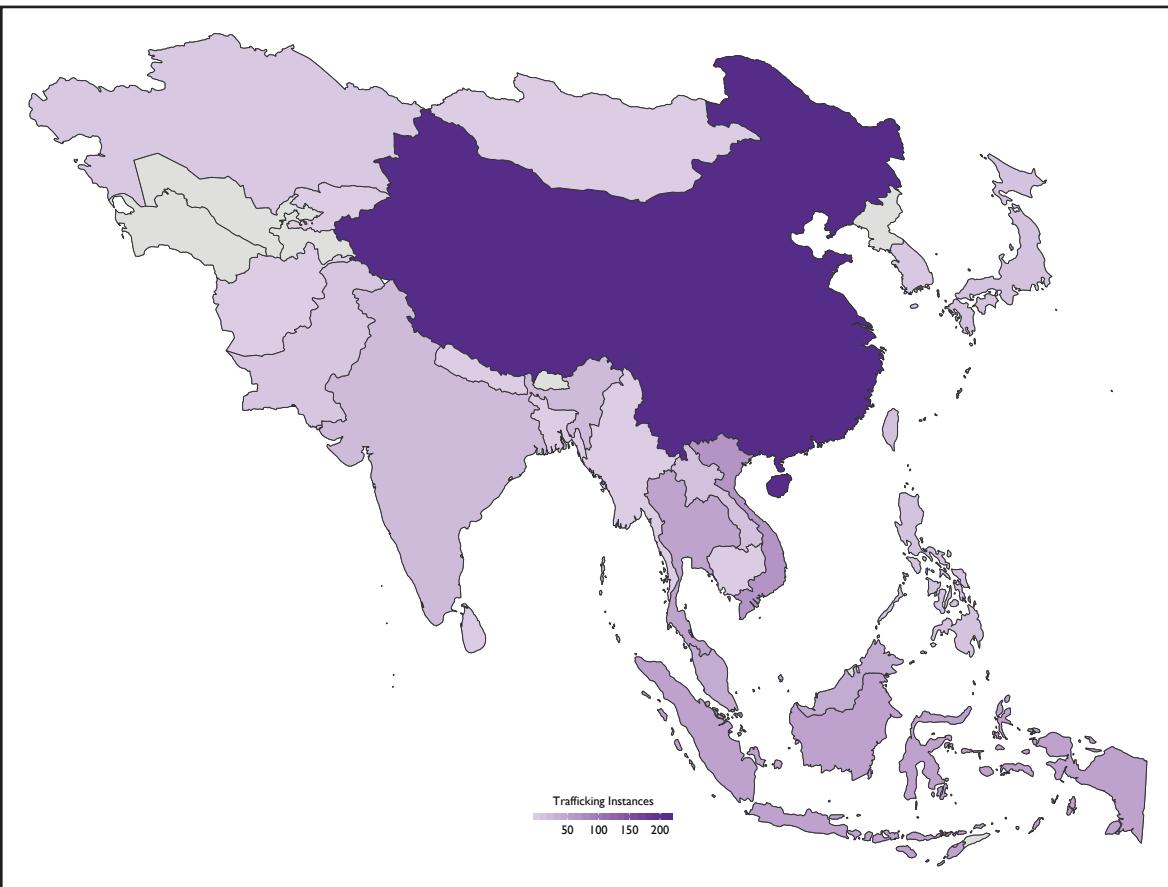


Figure 1. Heat map of wildlife and wildlife product trafficking instances in Asia's air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

The Asian heat map is remarkable in the number of Asian countries counting wildlife trafficking instances in their airports in just a three-year period. It appears that only six Asian countries – North Korea, Timor-Leste, Bhutan, Uzbekistan, Turkmenistan, and Tajikistan – did not have a publicized wildlife trafficking attempt pass through their airports between 2016 and 2018.

China is dominant

China was far and away the leading country in Asia by trafficking instance count, according to the C4ADS Air Seizure Database. Between 2016 and 2018, China was linked to over 150 wildlife trafficking instances moving through the air transport sector. In comparison, other prominent countries in the Asian heat map counted around 50 trafficking instances each within the same timeframe.

FIGURE 2

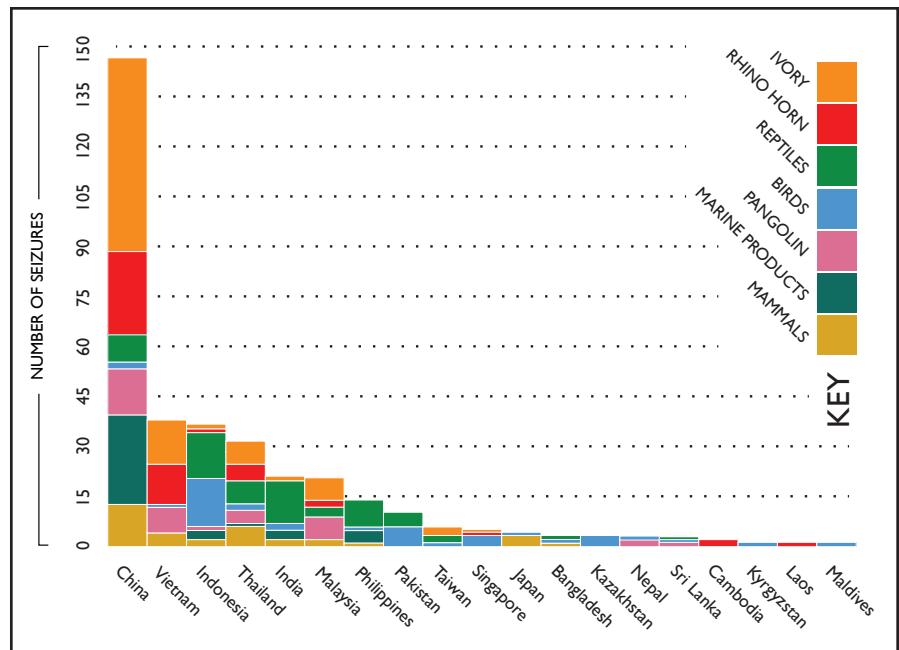


Figure 2. Total seizure count by Asian country (2016 – 2018)

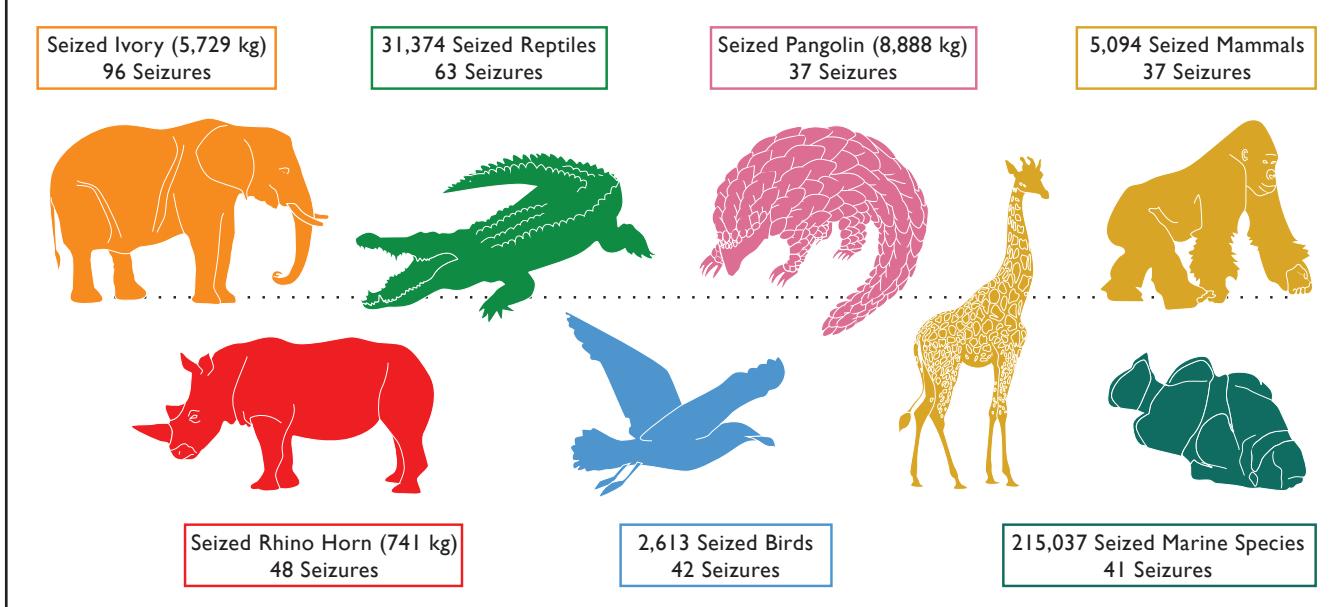


Figure 3. Number of seizures in Asia of each type of wildlife or wildlife product (2016 – 2018)

As in the heat map, China stands out in Figure 2 as the Asian country with the highest seizure count by far, according to the C4ADS Air Seizure Database, with about four times as many seizures as Vietnam, the country with the second-highest seizure count.

China's high seizure count

Between 2016 and 2018, Chinese authorities made at least 156 wildlife seizures in airports around the country. China's high seizure count was likely driven by a number of different factors.

First, Chinese cultural traditions that rely on exotic animals and wildlife products for consumption, decoration, and the pet trade, paired with a growing middle class and a huge population size, mean that demand for wildlife in China is greater than in any other country in the world.

Second, awareness of wildlife trafficking is relatively high in China, and Chinese enforcement tends to be effective. As a result, enforcement authorities in Chinese airports are well-positioned to stop wildlife trafficking instances.

Third, Chinese customs agencies are particularly good at publicly reporting wildlife seizures. Even the smallest ivory, coral, or clam seizures are often reported through the agency's Weibo account, along with a photo.

These four factors – substantial demand, high awareness, effective enforcement, and good reporting – all contribute to China's extremely high seizure count.

Marine species and mammals in China

According to the C4ADS Air Seizure Database, China made more ivory, rhino horn, pangolin, marine species, and mammal seizures than any other country in Asia between 2016 and 2018. Although Chinese demand for ivory, rhino horn, and pangolin is well-known, Chinese demand for marine species and mammals has received less attention.

“Substantial demand within China for wildlife, effective enforcement, good reporting, and high awareness of wildlife trafficking amongst Chinese officials all contribute to China’s high seizure count.”

Marine species seizures in China generally involved shark fins, European eels, seahorses, sea cucumbers, totoaba swim bladders, clams, or coral discovered in Hong Kong Airport (see **Demand for Marine Species in Hong Kong**).

These smuggling attempts originated from all over the world, including Spain, Mexico, Egypt, Peru, the Philippines, and Papua New Guinea.

Mammal seizures made in China were less numerous but similarly diverse, involving products such as antelope horns, deer antler velvet, tiger skins, black bear paws, and seal genitalia from the Americas, Africa, and Asia. Most of these products were likely intended for sale to traditional medicine vendors. Rather than concentrating in one airport, however, mammal seizures occurred throughout China, in Dalian, Qingdao, Xiamen, Guangzhou, Tianjin, and other cities.

DEMAND FOR MARINE SPECIES IN HONG KONG

Growing consumer demand in China for wildlife products is fueling the trade of marine species for use in cuisine and traditional medicines.ⁱ Hong Kong in particular is well-known as a major retail and distribution hub for high-end luxury seafood products.ⁱⁱ Legal seafood markets in upscale neighborhoods in the city, such as Sheung Wan, are hotspots for the sale of protected marine species, including totoaba fish bladders, dried shark fins, sea cucumbers, and abalone.ⁱⁱⁱ

Between 2016 and 2018, C4ADS documented thirteen seizures of marine species destined for Hong Kong in air transport. These trafficking instances originated in countries such as Mexico, Spain, Sri Lanka, South Africa, the US, and Portugal. Six of the reported seizures contained European eels sourced from Portugal or Spain and hidden in checked luggage or air freight. Seizures of European eels have risen markedly over the last few years (see **European Eel Trafficking**) and Hong Kong is likely both a destination and a transit point for eels en route to buyers in mainland China and Japan.^{iv}

Hiding protected marine species within other legal products and misreporting the smuggled animals or products as a different species on shipment documentation are both common methods used by marine species traffickers. Out of the thirteen marine species trafficking instances destined for Hong Kong between 2016 and 2018, at least six were falsely declared or hidden with other marine products.

For example, in May of 2018, a shipment of 989 kilograms of dried shark fins was seized by Hong Kong Customs. The shipment arrived in Hong Kong from Sri



Image 1. Bags of shark fins seized by Hong Kong Customs after arriving from Sri Lanka via Singapore. The bags were declared as "dried seafood." Source: Reuters/Sea Shepherd Global

Lanka via Singapore on Singapore Airlines, and included fins from endangered shark species (such as whale sharks, which are listed on CITES Appendix II) mixed with legal fins. Perhaps because Singapore Airlines^v banned the shipment of shark fins on their planes in 2014, the shipment was declared as "dried seafood" to "avoid the airline's internal booking checks."^{vi} The seizure prompted Singapore Airlines to blacklist the shipper, Win Lee Fung Ltd.,^{vi} and remind employees "to conduct sampling checks on shipments made under the label 'dried seafood' to ensure they [do] not contain shark fin."^{vii}

Although Hong Kong appears to be the most prominent city for marine species trafficking in Asia according to the C4ADS Air Seizure Database, at least six other Chinese cities made at least 20 more marine species seizures in their airports within the same time frame. Continued high levels of demand for marine species in Hong Kong and China poses a significant risk to populations of European eels, totoaba, seahorses, sea cucumbers, and abalone in Europe, the Americas, and Africa.

Bird seizures in Central Asia

At least three Central Asian countries – Pakistan, Kazakhstan, and Kyrgyzstan – made bird seizures between 2016 and 2018. Almost all of the Central Asian bird seizures involved falcons, usually saker or peregrine falcons, being smuggled between Central Asia and the Middle East as part of the illegal falconry trade. Most involved birds poached from their habitats and intended for sale to wealthy Middle Easterners. Other seizures that did not fit this pattern generally involved falcons being flown to and from hunting grounds in Central Asia and the Middle East (see **Falcon Smuggling & Corruption**).

Prevalence of pangolin seizures

Asian countries seized more pangolin scales by weight (8,888 kg) than any other wildlife product, including ivory (5,729 kg). This is relatively unsurprising given that pangolin trafficking activity has experienced a marked increase over the past few years, in part driven by increasing demand within Asia for pangolin scales. Over the same timeframe, ivory seizures in the air transport sector have generally become smaller and more numerous as trafficking methods have shifted to compensate for changes in enforcement awareness. Note though that most pangolin seized shipments are sent by sea, and so the true weight of all pangolin seized

between 2016 and 2018 is far greater than the roughly 9,000 kg discovered in airports and captured in the C4ADS Air Seizure Database.

Low seizure numbers in certain countries

A few of the countries visible in Figure 2 are well known for their involvement in wildlife trafficking, but counted relatively low seizure numbers between 2016 and 2018. Lao PDR (Laos), for instance, is notorious for its role in the illegal wildlife trade, and is home to the Golden Triangle and a number of well known wildlife traffickers. In another example, Japan, although not as notorious as Laos, is believed to have a larger market for certain animals and wildlife products (e.g. slow lorises and ivory) than seizure numbers would suggest. A number of NGOs and news outlets have documented easily exploitable loopholes in Japan's wildlife regulations (particularly relating to ivory) and how little attention wildlife trafficking receives within Japan.^{2 viii ix}

Low seizure numbers in both countries are likely due to a lack of will on the part of enforcement authorities to enforce wildlife trade regulations and intervene in wildlife trafficking attempts. It is also possible that confusion regarding the difference between legal and illegal shipments of wildlife and wildlife products plays a role in preventing seizures in Laotian and Japanese airports.

ⁱ A 2017 Sea Shepherd investigation noted that Cathay Pacific and Virgin Australia Cargo had also been targeted by shark fin traffickers. In every trafficking attempt Sea Shepherd identified, the traffickers were sending shipments with vague descriptions such as "dried seafood" or "marine products." Source: <https://www.seashepherdglobal.org/latest-news/sshk-sharkfin-bust/>

² In July 2019, Japan began requiring that ivory dealers "prove, via carbon dating, that ivory specimens were legally acquired." Prior to this new regulation, ivory owners did not have to provide verifiable proof of their ivory's legal origin. NGOs hailed the change as a positive step forward for Japan. Source: <https://wildaid.org/japan-announces-tighter-controls-on-domestic-ivory-market/>

FIGURE 4

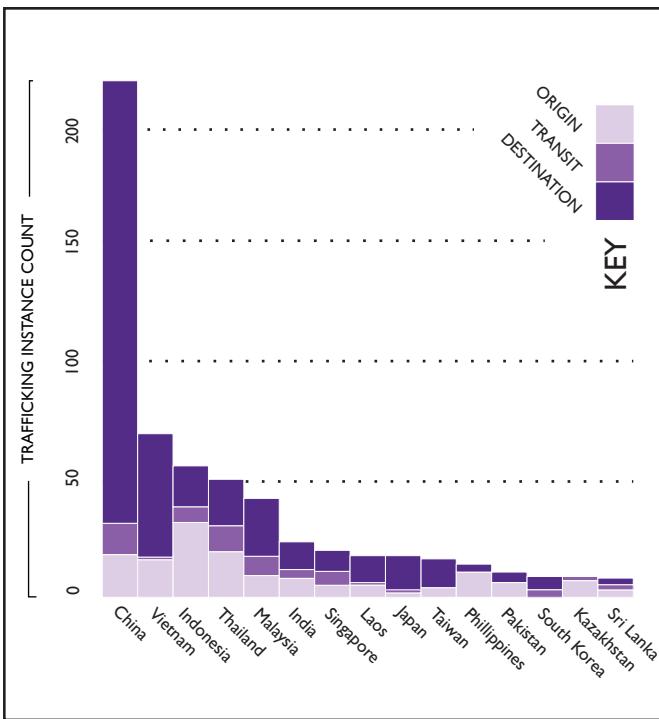


Figure 4. Country-level flight route information for African countries with ten or more trafficking instances (2016 – 2018)

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

Asian countries were predominantly destination points for wildlife trafficked by air according to the C4ADS Air Seizure Database, although three countries – Indonesia, the Philippines, and Kazakhstan – were mostly origin points for trafficked wildlife between 2016 and 2018.

Asia as a destination region

Only one country in Figure 4, Kazakhstan, was not listed as an intended destination point for any known wildlife trafficking instances between 2016 and 2018. Every other country counted at least one destination trafficking instance, for a total of 376 known destination instances in the region, accounting for 66% of all Asian trafficking instances during that timeframe.

Many countries feature as origin, transit, and destination points

Of the 15 countries visible in Figure 4, ten counted at least one origin, transit, and destination instance each.

India, for instance, was a common origin point for specific reptile species, like Indian star tortoises, that are in demand in the Asian pet trade. It also acted as an occasional transit point for trafficked wildlife, including for a shipment of endangered Malagasy ploughshare tortoises flying from Madagascar to Nepal in March 2016.^x Finally, Chennai, India appears to have a substantial demand market for red-eared slider turtles imported from China and Thailand. Red-eared slider trafficking is so prevalent in the area that each of the four known red-eared slider trafficking instances destined for Chennai between 2016 and 2018 included more than 2,000 animals, with the largest seizure totaling 4,800 turtles in December 2018 (see **Reptile Trafficking in India**).^{x1}

FIGURE 5

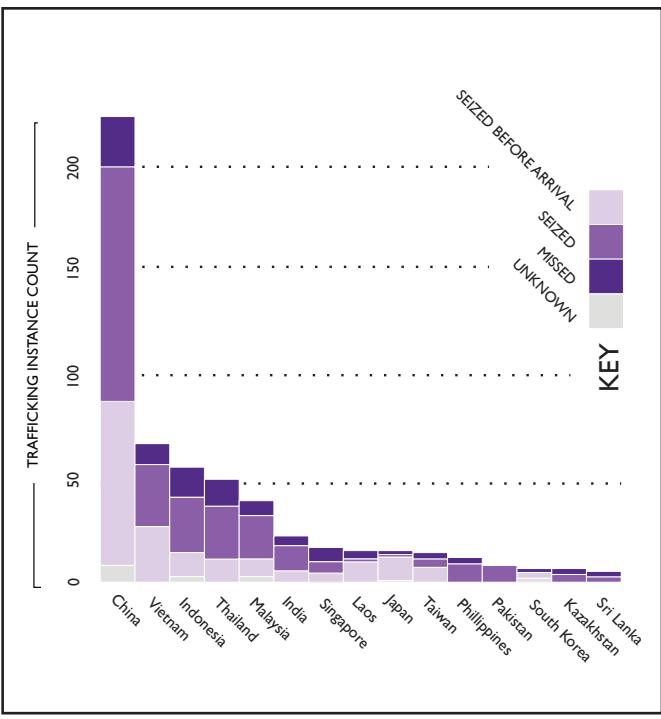


Figure 5. Point of seizure within the supply chain by Asian country (2016 – 2018)

Some countries are primarily origin points

Although the vast majority of Asian countries are usually destination points for trafficked wildlife, at least three Asian countries were more often origin points for wildlife trafficked by air between 2016 and 2018.

Indonesia ranked third in Asia in terms of trafficking instance count, according to the C4ADS Air Seizure Database. Indonesia's prominence in Figure 4 is primarily driven by two factors: the high number of in-demand species living in the country, and the country's geography. Indonesia is one of the only remaining countries in the world that is still home to elephants, rhinos, and pangolins, as well as a large number of reptile, bird, mammal, and marine species. But Indonesia is an island nation, and much of the country's remaining biodiversity is distributed far from the capital city, Jakarta, where the country's main international airport sits. This means that a fair number of trafficking instances originating in the country flew from smaller airports in Sumbawa or Medan to Jakarta before flying elsewhere (see **Indonesian Pig-Nosed Turtles and Insider Threat**).

The Philippines is also a biodiverse country, and acted as an origin point for a variety of reptile and marine species, including coral, clams, shark fins, monitor lizards, and sailfin lizards, as well as tarsiers, owls, and worked ivory (see **Tarsiers and Insider Threat**). The majority of Philippine trafficking instances flew out of Manila to a wide array of destinations, including Japan, the United States, Sweden, and Taiwan.

Kazakhstan's trafficking instances generally either involved trafficked falcons or mammal products. For instance, three trafficking attempts involving falcons, mostly saker falcons, were stopped in Kazakhstan on the way to Qatar and the UAE in 2016 and 2017. Kazakhstan's involvement in mammal trafficking is lesser known, but the country also acted as an origin point for three mammal trafficking instances involving a serval

and wolf, lynx, and zebra skins on the way to China and Germany between 2016 and 2018. While falcons, wolves, and lynx are all native to Kazakhstan, servals and zebras are not, suggesting that wildlife trafficking groups may be operating out of the country and peddling in various native and non-native species and products.

Generally high seizure rates

Few Asian countries missed many wildlife trafficking instances linked to their airports between 2016 and 2018. Rather than serving as evidence of exceptional enforcement throughout the continent, however, this likely reflects Asia's status as a destination region.

Seizure rates in destination countries are subject to a number of biases. First of all, destination countries benefit from effective enforcement in origin and transit countries that help prevent

trafficked wildlife from entering their airports in the first place. Second, unlike screening conducted for departing flights, customs screening for arriving flights is designed to find trafficking attempts, meaning wildlife is more likely to be found at destination points than at origin or transit points. Finally, destination countries are at the end of the chain; enforcement authorities at destination airports provide the final check for smuggling attempts within the air transport sector. Once trafficking attempts make it past them, they have successfully exploited the aviation industry and move out of the system. This means that any trafficking attempts that pass through destination airports undetected cannot be counted as "missed" instances for any airports. As a result, seizure rates in destination countries are inflated compared to seizure rates in origin and transit countries, and may inaccurately reflect the number of trafficking attempts that successfully moved through their airports.

REPTILE TRAFFICKING IN INDIA

South Asian countries, particularly India, have historically had a significant role in the reptile trade. India's involvement in the illegal reptile trade is so significant that recent reports estimate that around 11,000 turtles and tortoises are trafficked through the country each year.^{xii}

According to the C4ADS Air Seizure Database, India functions as both a source and a destination point for different species of trafficked reptiles. One Indian species in particular, the Indian star tortoise (CITES Appendix I as of 2019), has been in increasingly high demand as an exotic pet in Malaysia and Thailand. Most trafficking instances involving Indian star tortoises left from Chennai, India in checked luggage on the way to Kuala Lumpur, Malaysia or Bangkok, Thailand, and usually involved hundreds of hatchling tortoises. For example, in December of 2017, two individuals were detained with 210 Indian star tortoises in their checked luggage at Chennai Airport.^{xiii} The tortoises were hidden within two plastic boxes and beneath chocolates.^{xiv}

In the past few years, however, Indian star tortoise seizures have decreased markedly. Local news reports suggest this may be because of increased awareness and enforcement activity at common origin airports, which has allegedly forced traffickers to use maritime routes.^{xv} For instance, a shipment of star tortoises was discovered in 2017 after being ferried from Rameswaram, India to Sri Lanka.^{xvi}

As Indian star tortoise trafficking by air has declined, red-eared slider trafficking has appeared to increase. Red-eared slider seizures are often similar to star tortoise seizures; they generally involve many hatchling turtles hidden in checked luggage. But red-eared sliders are smuggled in the opposite direction, moving from Thailand, China, and occasionally Malaysia to Chennai (every red-eared slider seizure in the C4ADS Air Seizure Database was discovered in or en route to Chennai Airport). Red-eared slider seizures also generally involve significantly more turtles, usually ranging between 2,000 and 9,000 individuals.

In one seizure on December 20, 2018, two passengers were



Image 2. On August 27, 2016, customs officials in Chennai Airport found 4,000 red-eared slider turtles in the luggage of a passenger arriving from Malaysia. Each of the turtles was roughly one inch in length. Source: New Indian Express

stopped by customs officials on arrival at Chennai Airport due to suspicious behavior.^{xvii} The officials discovered a total of 4,800 red-eared sliders stashed in cartons in their checked luggage. The suspects had arrived on a Thai Air flight from Bangkok. In a similar seizure in October of 2018, an individual arriving on a Thai Air flight from Ghaonzu, China via Bangkok was stopped by customs officials due to reportedly suspicious behavior. Upon further inspection, officials found 2,300 turtles stored in cartons in his checked luggage.^{xviii}

The scale of these seizures, as well as the apparent increase in red-eared slider trafficking activity, lend credence to South Asia's reputation as the global epicenter of turtle and tortoise trafficking. Though smuggling of endangered Indian star tortoises may appear to be decreasing, the apparent decline in star tortoise seizures may actually be an indication that effective enforcement in airports has forced traffickers to rely on alternate routes. Still, seizure data indicates red-eared slider trafficking shows no signs of abating, and continues to pass through South Asian airports relatively frequently.

INDONESIAN PIG-NOSED TURTLES & INSIDER THREAT

ABANDONED BAGS IN MUMBAI

Traffickers of wildlife and other contraband will occasionally go to great lengths to distance themselves from the illegal goods hidden in their bags.

For example, in March 2016, authorities in Mumbai Airport noticed an abandoned bag had developed a strange smell after sitting unclaimed for a week.^{xx} Upon further inspection, officials discovered 146 critically endangered tortoises (139 radiated tortoises and six ploughshare tortoises, both CITES Appendix I) from Madagascar inside. The tortoises had been wrapped in plastic bags and taped, presumably to prevent them from moving. Two of the radiated tortoises had died after their shells were broken. The passenger associated with the bag had traveled onto Kathmandu, Nepal leaving the bag behind.

Ploughshare tortoises are particularly rare, with only 500^{xx} or so left in Madagascar, meaning the six found in Mumbai could have represented as much as 6% of the remaining wild population.



Image 3. Some of the tortoises found wrapped in plastic and taped in Mumbai. Source: Kiran Kumar Karlapu



Image 4. Plastic containers used to smuggle 12 CITES-protected Chinese hwamei birds. Source: Singapore AVA

Indonesia is a common origin point for trafficked wildlife, especially reptile species like pig-nosed turtles and green tree pythons, both of which are in demand as pets. But Indonesia's role as an origin point may be due to more than just the country's biodiversity; a number of pig-nosed turtle seizures in early 2016 seemed to be linked to a wildlife trafficking network operating with the support of certain airport officials.

In February, officials at Mozes Kilangin Airport in Timika in Papua, Indonesia discovered 3,230 endangered pig-nosed turtles (CITES Appendix II) packed in 190 plastic boxes and hidden in four suitcases.^{xxi} The turtles were set to fly to Jayapura, Indonesia on Sriwijaya Air before heading on to Jakarta. Reports of the seizure explained that the traffickers behind the seizure had intentionally moved the suitcases through the entrance of the old airport, which had no X-ray machines.

A week later, officials in Jakarta's Soekarno-Hatta Airport found 3,737 pig-nosed turtles and 883 snake-necked turtles in 38 boxes destined for Hong Kong.^{xxii} The seizure occurred after Indonesian officials noticed that boxes containing 15,200 clown loach fish that had already been cleared by customs authorities appeared different than they had before. Closer inspection revealed the turtles. At least three individuals were arrested in connection with the seizure.

About a month later, security officers in Mozes Kilangin Airport discovered another shipment of pig-nosed turtles, this time of 1,220 turtles, packed



Image 5. One of the pig-nosed turtles seized in Jakarta in late February 2016. Source: Nufus Nita Hidayati

in two cardboard boxes after the boxes passed through an X-ray machine.^{xxiii} As in the first seizure, these turtles were supposed to fly to Jakarta on a Sriwijaya Air flight. According to an official, "A person, with the initial 'S', carried [the boxes] to Timika Airport terminal." Seizure reports described "S" as a ground handler for Sriwijaya Air at Mozes Kilangin Airport.

These three seizures were not unique; a series of similar seizures also took place in 2014 and 2015. The earlier seizures also involved thousands of pig-nosed turtles shipped from smaller Indonesian airports to Jakarta before flying internationally.^{xxiv} These shipments were also falsely declared as "live tropical fish" or similar species, like mangrove crabs. Taken together, these seizures likely represent the operations of a coordinated network or networks of traffickers shipping pig-nosed turtles to East Asian destinations year after year. Note, however, that the C4ADS Air Seizure Database does not document any seizures following the same pattern after the March 2016 seizure when a trafficker working as a ground handler was arrested.

TARSIERS & INSIDER THREATS

A seizure in the Philippines in 2016 highlighted how airport authorities can exploit their positions to smuggle illegal wildlife and other contraband.

On January 28, 2016, officials at Manila's Ninoy Aquino Airport intercepted a shipment of 47 rare animals, including 11 tarsiers, 11 snakes, 11 monitor lizards, and eight sailfin lizards, as well as eagle owls and scops owls.^{xxv} The animals had been packed in Styrofoam boxes and labelled as aquatic plants. They were destined for Japan.

After the seizure, officials explained that they had received a tip in January 2015 about wildlife trafficking at the airport. During subsequent surveillance, they observed an airport police officer "going back and forth to the airport," transporting items for shipping.^{xxvi} He had already used his position to send multiple shipments of Philippine wildlife to a partner in Japan.^{xxvii}

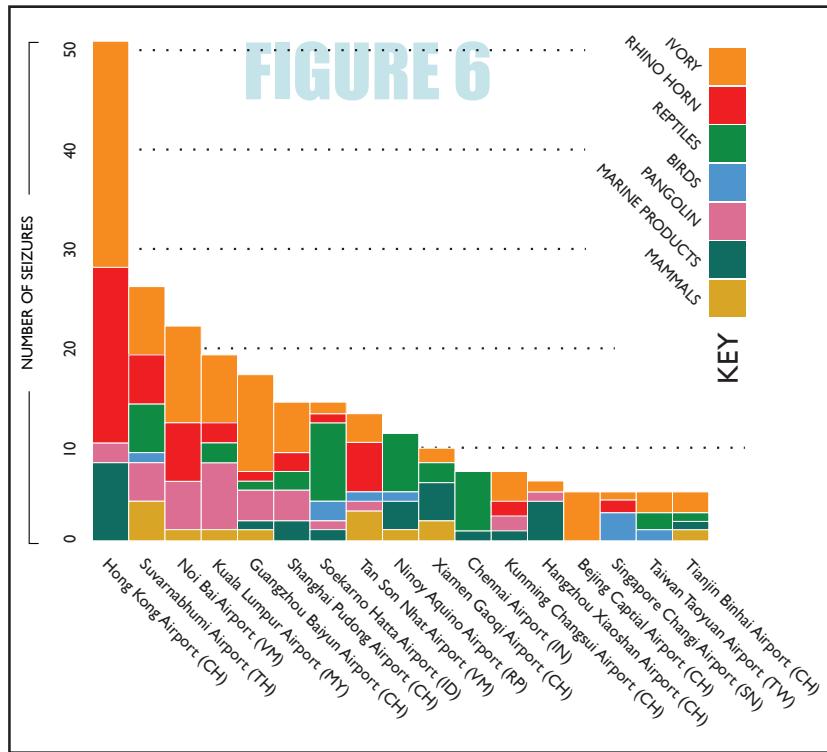


Figure 6. Airport seizure count for Asian airports with five or more seizures (2016 – 2018)

Between 2016 and 2018, authorities in 17 Asian airports made five or more wildlife seizures, according to the C4ADS Air Seizure Database. Of those 17 airports, eight were in China, accounting for about 48% of the seizures visible in Figure 6. The only other country with five or more wildlife seizures in more than one of its airports was Vietnam, which counted 38 seizures (15%) in two airports, Noi Bai and Tan Son Nhat.

Dominance of Hong Kong Airport

Officials in Hong Kong Airport made far more known wildlife seizures between 2016 and 2018 than enforcement authorities in any other airport in the world (see

Demand for Marine Species in Hong Kong). High levels of wildlife trafficking activity in Hong Kong are not just restricted to the city's airport, however; maritime seizures of wildlife in Hong Kong are also common, and almost always involve greater quantities of wildlife products than can be found in even the largest air freight shipments.

Certain wildlife species and wildlife products are clearly in high demand in Hong Kong. For instance, mainland Chinese citizens have been known to travel to Hong Kong to purchase wildlife products that they cannot buy at home. This is likely at least partially a result of more lax legislation; for example,

Chinese President Xi Jinping agreed in 2015 to ban ivory sales in China beginning on January 1, 2018, while Hong Kong's legislature only voted to ban ivory sales in January 2018.^{xxviii} As a result, ivory sales in Hong Kong will continue until 2021.^{xxix} Similarly, a number of undercover NGO investigations into totoaba trafficking in Hong Kong in 2015 determined that Hong Kong customs was considered "free entry" by traffickers, while mainland Chinese authorities were considered much more strict.^{xxx} Some totoaba traders also explained that mainland Chinese preferred to buy totoaba in Hong Kong rather than mainland China due to a perception that Hong Kong product was "higher quality."^{xxxi} All of this taken together suggests that Hong Kong, in addition to having its own substantial demand for wildlife, may function as a gateway for wildlife traffickers trying to move product into mainland China.

With that said, it is important to note that Hong Kong customs and enforcement agencies are both effective and consistently publicly report seizures, meaning Hong Kong Airport's high seizure count is likely a result of a combination of high trafficking activity, effective enforcement, and thorough reporting.

Pangolin seizures concentrated in Kuala Lumpur Airport

Officials in Kuala Lumpur Airport made more pangolin seizures than officials in any other airport in Asia between 2016 and 2018. All of the seizures shared a few characteristics; they all involved pangolin scales moved in air freight or mail shipments traveling with falsified documents, including fake destination addresses (see **Pangolins & Malaysia** in *In Plane Sight* for more information). Two were declared "general products and dry herbs" and flew to Malaysia on Kenya Airways and Emirates Airlines. Another two were declared "oyster shells" and relied on Turkish Airlines to travel to Malaysia. A final two were declared "samples" and were transiting through Kuala Lumpur Airport using POS Malaysia on the way to Hong Kong.

While 71% of the Kuala Lumpur seizures in the C4ADS Air Seizure Database contained African pangolin scales originating in Ghana or the DRC, 29% contained scales likely taken from Malaysian Sunda pangolins. It is therefore possible that the concentration of pangolin scale seizures in Kuala Lumpur Airport between 2016 and 2018 was a result of the combined effect of demand for pangolin scales in the country and the existence of native Malaysian pangolin species. It is also possible that, given the similarities between the seizures documented in the airport, one or more pangolin trafficking networks have operated out of Kuala Lumpur.

FIGURE 7

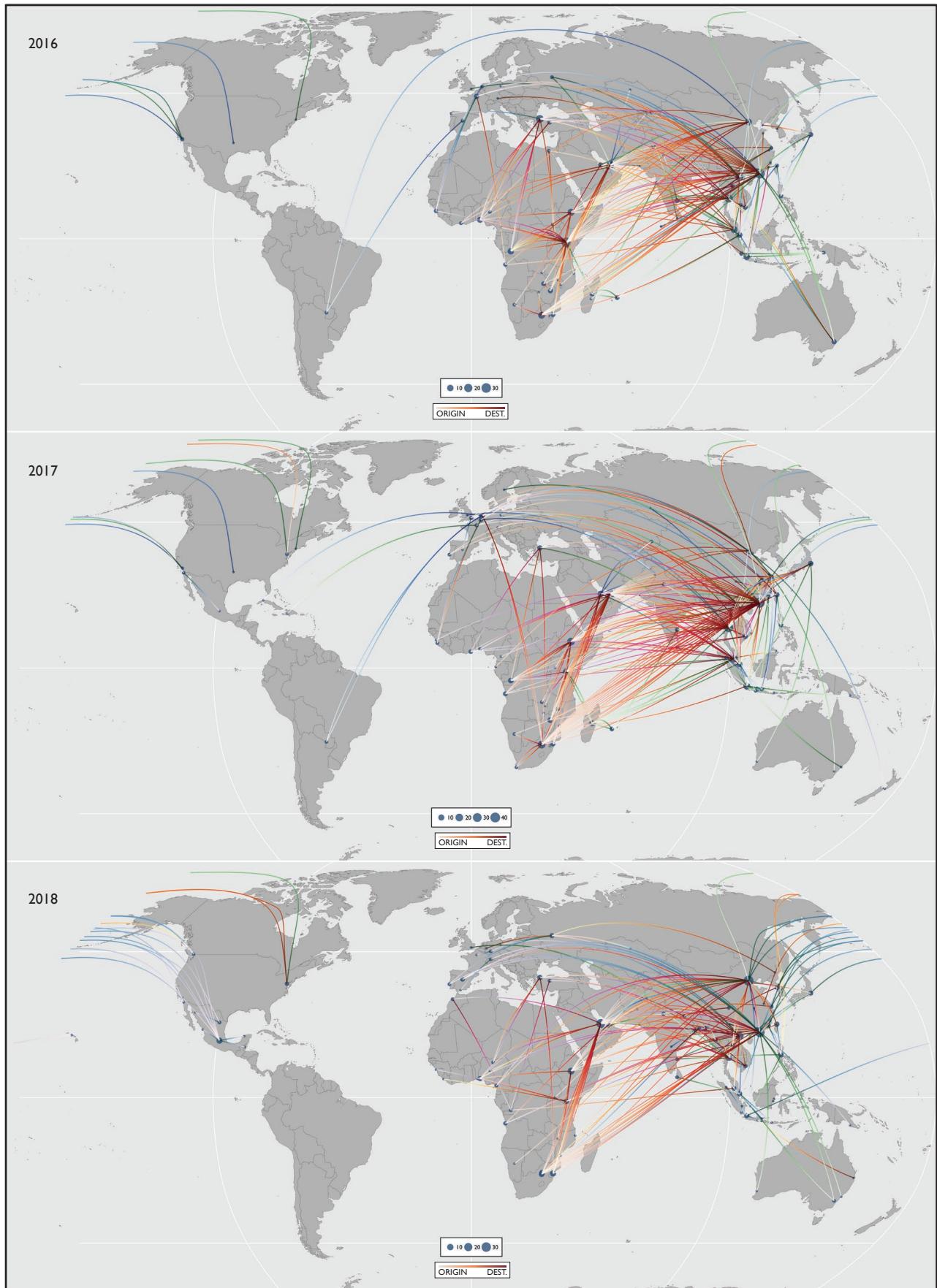


Figure 7. Asian air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city. Capital cities are used when specific airports are unavailable.

THE HEALTH RISKS OF LIVE BIRD TRAFFICKING

ASIA

The Asian routes map clearly depict the pervasiveness of wildlife trafficking by air in the region, as well as Asian countries' tendency to act as destination points for a vast array of wildlife, importing ivory, reptiles, birds, and other species from all over the world.

Clear flow of wildlife products from Africa to Asia

One of the clearest patterns visible in the Asian routes maps for 2016, 2017, and 2018 is the relatively consistent flow of ivory, rhino horn, and pangolin from African origins to Asian destinations. Each wildlife product tended to originate in a slightly different region of Africa (e.g. rhino horn in South Africa, pangolin in West Africa) destined for a mix of airports in East and Southeast Asia, with no clear destination preference visible. The flight routes for each product clearly relied on transit hubs in the Middle East and Europe, although direct routes from Johannesburg and Nairobi to Bangkok, Hong Kong, and Beijing were also common.

IMPORTANCE OF TRANSIT HUBS

Intra-Asian wildlife trafficking

Although not clearly visible in Figure 7, intra-Asian wildlife trafficking was common, with the C4ADS Air Seizure Database capturing intra-regional ivory, rhino horn, reptile, bird, pangolin, marine species, and mammal trafficking instances between 2016 and 2018. Ivory, rhino horn, pangolin, and marine species tended to fly from Southeast Asian countries to China, Vietnam, Singapore or Taiwan, while reptiles, birds, and mammals often originated in South or Southeast Asia destined for a variety of different Asian countries (see **Live Animal Trafficking in Bangkok**).



Image 6. Plastic containers used to smuggle 12 CITES-protected Chinese hwamei birds. Source: Singapore AVA

All animals can potentially carry infectious diseases that, when not managed appropriately, can create a health risk to related species. Birds, for example, can carry over 60 diseases that are transferrable to humans and other species, including Salmonellosis, E. coli, avian tuberculosis, and H5NI.^{xxxii} National and international health organizations have instituted regulations to try to reduce the potential spread of avian diseases by prohibiting the importation of birds from certain countries and requiring that exported and imported birds receive certificates of health before travel. These regulations have become even more crucial as the aviation industry has grown, creating the possibility that the world's next pandemic could be spread farther and more quickly than ever before by airplane.

But wildlife traffickers intentionally operate outside of the legal transportation system and pay no attention to these precautions, and so seizures sometimes include birds sick with infectious diseases.

In one seizure in Singapore on December 9, 2016, officials discovered 12 Chinese hwamei birds (CITES Appendix II) in two Vietnamese men's suitcases.^{xxxiii} The birds had been placed in plastic containers and wrapped in clothing, and one had already died. The Vietnamese suspects were attempting to fly from Changi Airport to Vietnam at the time of the seizure.

A follow-up investigation conducted by the Singapore Agri-Food and Veterinary Authority (AVA) found that the birds had been in the containers for about 12 hours without food or water. They also found that one of the birds tested positive for influenza A strain H3N8 (equine influenza), a virus common in birds, horses, and dogs. H3N8 was the apparent cause of the 1889 to 1890 flu pandemic,^{xxxiv} although it does not generally appear to be transmissible to humans.

FIGURE 8

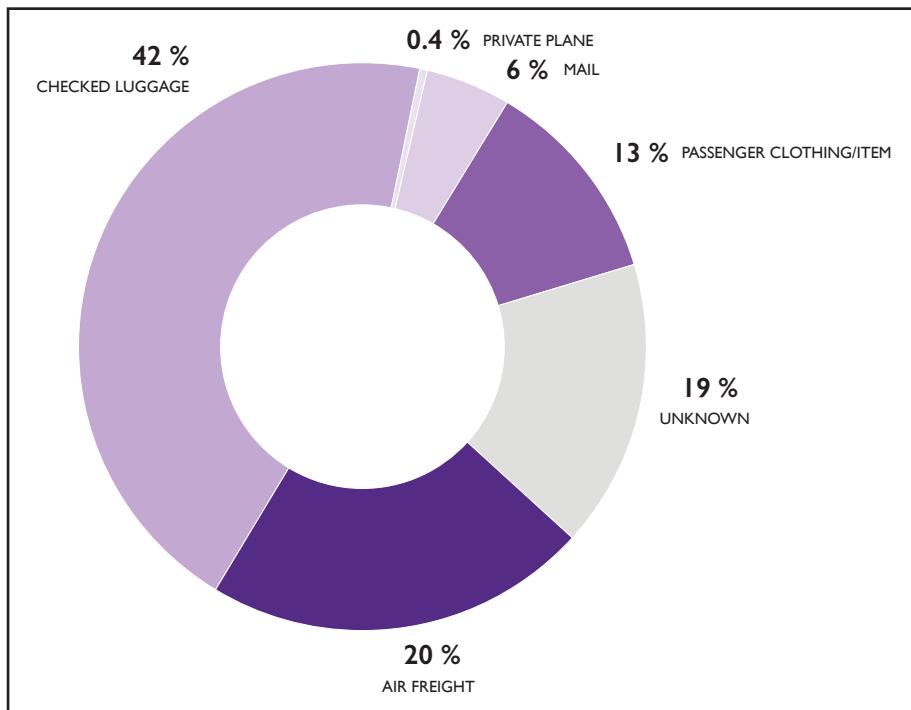


Figure 8. Transport methods for Asian air trafficking instances in the air transport sector (2016 – 2018)

The transport method breakdown for wildlife trafficking instances in Asian countries between 2016 and 2018 is remarkably similar to the one for Africa. Since transport methods are generally dependent on the species or wildlife product being trafficked, this similarity probably reflects the movement of the same wildlife and wildlife products through both regions.

Appearance of mail

Though Asian wildlife trafficking instances were hidden in mail shipments infrequently, Asia counted more mail instances by percentage than Europe, Africa, or the Middle East. Asia's comparatively high number of mail instances was likely driven by particularly good seizure reporting in certain Asian countries.

Small-scale ivory instances increasingly moved in passenger clothing/items

In general, ivory was most frequently moved by checked luggage between 2016 and 2018, although more ivory by weight was moved in air freight. However, as wildlife product processing increasingly moved towards source regions, ivory smuggling attempts hidden in passengers' carry-on bags or clothing seemed to become more frequent.

This apparent shift has at least three potential explanations: it could be that traffickers have found that moving small amounts of ivory repeatedly is safer and easier than moving large shipments; it could be that enforcement officials at destination airports

have become particularly adept at identifying wildlife, and so are now increasingly stopping unwitting tourists with one or two ivory pieces; or it could be that small-scale ivory seizures have always been common, and recent improvements in public seizure reporting have created the appearance of a change in trafficking or enforcement activity.

Either way, 28% of trafficking instances discovered in passengers' carry-on bags or clothing between 2016 and 2018 involved small quantities (usually less than a kilogram) of worked ivory. Other trafficking instances moved by passenger clothing/items were mostly of mammal products like lion fangs and leopard skins, or live birds and mammals intended for sale.

Rhino horn moved in checked luggage

Although other wildlife products commonly smuggled between Africa and Asia seem to be variously smuggled in air freight (pangolin, ivory, and marine species), hidden in checked luggage (ivory and marine species), or carried by passengers (ivory), rhino horn is almost always moved by checked luggage. Between 2016 and 2018, 67% of rhino horn trafficking instances were hidden in checked bags. This is in part because, unless they are heavily processed, rhino horns are too large and unwieldy to carry in anything other than checked luggage and air freight. But rhino horns are also comparatively hard to come by, making large rhino horn trafficking attempts rare and perhaps lessening traffickers' need to rely on potentially expensive air freight shipments.

LIVE ANIMAL TRAFFICKING IN BANGKOK

Asian seizure data compiled within the C4ADS Air Seizure Database suggest that wildlife markets in Asia sell not only Asian animals and processed wildlife products like ivory, but also non-native live animals previously smuggled into Asia. Several recent seizures highlighted the importance of wildlife markets in Bangkok to the live animal trade between Thailand and Japan.

For example, in September 2017, Thai customs officials received a tip that someone was going to try to smuggle wildlife on a Thai Airways flight from Bangkok to Japan.^{xxxv} Thai officials later identified a Japanese man, 53-year-old Kazunori Shirafuji, with two fennec foxes and four jerboas hidden in cages in his luggage in Suvarnabhumi Airport. Neither species is native to Thailand, however; both are generally found in the deserts of North Africa.

In addition, between February and October 2017, customs officials in Bangkok stopped at least four live animal trafficking attempts on their way to Japan. Each was accompanied by one Japanese trafficker, and three involved otters (the fourth was the fennec fox and jerboa seizure). Most were hidden in cages within a suitcase.

In the first seizure in February, a 57-year-old Japanese man, Kazushi Yamamoto, was arrested at Don Mueang Airport in Bangkok with 12 otters, five owls, and three hawks in cages and boxes in his luggage.^{xxxvi} The suspect told authorities he had purchased the animals at Chatuchak Weekend Market to raise as pets back home in Japan. In June, a 42-year-old Japanese man was stopped at Suvarnabhumi Airport with 11 otter pups in his suitcase.^{xxxvii}

He was scheduled to fly to Narita Airport in Japan, and told officials that he had purchased the otters at Chatuchak Weekend Market to keep as pets in Japan.



Image 7. One of the birds seized in Don Mueang Airport in February 2017. Source: The Nation



Image 8. Baby otters found in the suitcase of a woman flying from Bangkok to Narita, Japan. Source: Royal Thai Police

Finally, in October, officials in Don Mueang Airport stopped a 22-year-old Japanese woman, Kaede Yamaguchi, as she tried to check her suitcase for Thai AirAsia X flight XJ600 to Narita.^{xxxviii} Officials discovered 10 otter pups in a basket inside. She told officials that she had felt sorry for the otters when she found them for sale in Chatuchak Weekend Market, and so bought them to raise as pets in Japan.

These seizures indicate that there is demand for live exotic animals, especially otters,^{xxxix} for the pet trade in Japan, and that the Chatuchak Weekend Market in Bangkok is at the center of wildlife trafficking activity in Bangkok. One visitor posted a review of the Market online, stating: "...avoid the animal section because the animals often look like they are in stressing conditions. Every kind of animal you can imagine is sold here. Some are well-kept; some are not... The animal section appears to be the largest part of this market."^{xl}



Image 9. One of the fennec foxes and two of the jerboas seized in Suvarnabhumi Airport. Source: Patipat Janthong

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EUROPE

MAIN TAKEAWAYS

There is significant demand in Europe for live animals for the pet trade, including reptiles and birds.

European eel trafficking is prevalent and likely increasing due to Asian demand, threatening the survival of this critically endangered species.

Most recent mammal seizures in European airports have involved mammal products and derivatives, such as wolf skins, primate skulls, bear bile, and musk deer preputial glands.

Certain European countries with large, international airports, such as France and the Netherlands, often act as transit points for trafficked wildlife and wildlife products moving between source and demand regions in the Americas, Africa, and Asia.

Several European countries had high seizure rates regardless of whether they were primarily origin, transit, or destination points, suggesting that certain customs and enforcement mechanisms can lead to wildlife seizures on departure and in transit, as well as on arrival.

Portugal was one of the main origin points for European eel smuggling attempts, but had one of the lowest seizure rates in Europe. Given the increasing prominence of European eel trafficking, Portuguese officials should try to inspect checked suitcases and air freight shipments on departure for signs of European eels, such as ice packs and plastic bags filled with water hidden in a large number of suitcases or containers.

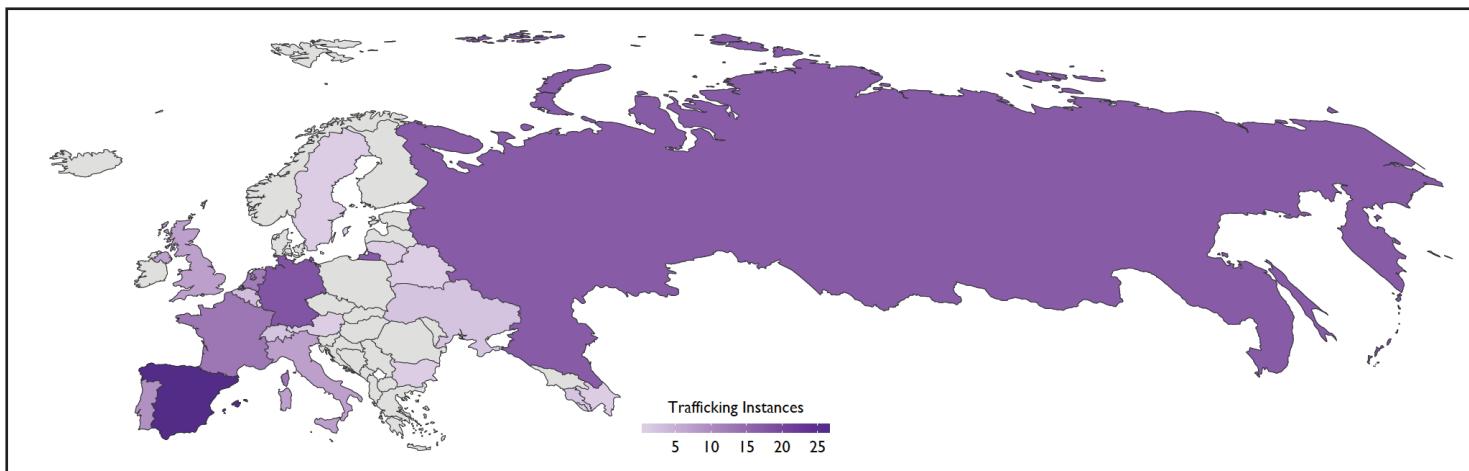


Figure 1. Heat map of wildlife and wildlife product trafficking instances in Europe's air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

Even though Europe is not generally considered a hotspot for wildlife trafficking, the European heat map reveals wildlife trafficking activity throughout the region. A variety of factors contribute to the appearance of the highlighted countries, including significant domestic demand for live animals for the pet trade, transit flights connecting Africa and Asia, Europe-based wildlife trafficking networks, and the presence of native species in high demand in other world regions.

Prominence of Spain

According to the C4ADS Air Seizure Database, Spain counted more trafficking instances than any other European country between 2016 and 2018. Spain's high trafficking instance count was driven by at least one trafficking network operating out of the country and Spain's role as an origin for trafficked species.

Spain functioned as the home base of a wide-ranging bird trafficking network that was involved in as many as 10 or 12 seizures of various bird species between at least 2016 and 2017 (see **Spain & Bird Trafficking in In Plane Sight**). Spain is also home to a significant population of critically endangered European eels living along the country's Atlantic and Mediterranean coastlines, as well as in some of the country's inland waterways (see **European Eel Trafficking**). European eel seizures tend to be particularly large: the six known European eel trafficking instances that originated in Spain between 2016 and 2018 involved well over a million smuggled eels.

Appearance of Russia¹

Russia—though not well-known for involvement in the illegal wildlife trade—holds the world's two largest remaining forests and a large percentage of the world's tundra, which are home to diverse species including reindeer, polar bears, tigers, saiga antelopes, Amur leopards, sturgeons, and peregrine falcons. The country's often overlooked biodiversity, coupled with its proximity to demand regions in Asia and the Middle East, put it at risk of becoming a prominent origin region for certain in-demand species. For instance, there were eight known mammal seizures in Russian airports between 2016 and 2018, most of which involved wildlife products taken from musk deer (preputial glands) or brown bears (paws, gall bladders, and bile), as well as walrus tusks and mammoth ivory. Most of these seizures were destined for South Korea or China.

There also appeared to be a market for certain trafficked species and wildlife products in Russia. For example, Russian citizens have been implicated in a number of seizures of reptiles destined for breeding or sale in the country. These seizures have often involved venomous or poisonous reptiles and insects, such as scorpions, cockroaches, and tarantulas. There have also been a couple of seizures of rhino horns found in the luggage of Russians returning from southern Africa.

¹Although Russia is a Eurasian country, it could not be included in both the European and Asian analyses conducted for this report. Since the majority of Russia's population lives on the western side of the country, C4ADS chose to include Russia within the European analysis.

RUSSIA: A SOURCE COUNTRY OF SMUGGLED WILDLIFE

Russia is not generally thought of as a significant source country for trafficked wildlife. This framing, however, belies Russia's significant role as the principal source of several heavily consumed species, which are used in traditional Asian medicine.

While Russia is not home to many of the animals principally thought of as the main victims of wildlife trafficking, it is home to several animals that are in high demand in East Asia, such as bears and musk deer. Bears are prized in certain Asian countries for their claws and gallbladders, which are used in traditional medicine to treat a wide variety of ailments, from heart pain and liver diseases to headaches, hangovers, cancer, and the common cold.ⁱ

Russia has been used as a source country for bear parts as Asiatic black bear (CITES Appendix I) populations have declined in East and Southeast Asia. For example, in 2017, two Vietnamese passengers en route from Yuzhno-Sakhalinsk Airport to Seoul, South Korea were stopped with four bear paws, one bear gallbladder, and 31 bear claws.ⁱⁱ Similarly, in 2018, a Chinese citizen was arrested attempting to fly from Vladivostok Airport to China with two bear gallbladders.ⁱⁱⁱ

A similar dynamic is visible in seizures of deer parts, which are also prized for their supposed curative properties in traditional medicine. Musk deer in particular are highly prized for their preputial glands, which are reportedly useful in curing skin ailments and poor circulation, and are also in demand for perfume. While China has claimed some limited success in farming musk deer at scale, the current population of the deer within China is insufficient to sustain demand for the musk their glands produce. As such, traffickers have turned their eyes further afield, to the Siberian musk deer (CITES Appendix II), which lives in Russia, Mongolia, China, and Kazakhstan. As a result, musk deer glands are often smuggled through Russian airports. For instance, in 2017, a sniffer dog discovered 12 kilograms of deer glands in coffee bags in the luggage of a South Korean traveler as he attempted to pass through Vladivostok Airport.^{iv} A year later, Russian customs officers in Vladivostok Airport discovered 9.5 kilograms of dried musk glands from more than 352 deer in a warehouse attached to the airport.^v The traffickers tried to transport the glands to China using falsified paperwork from a Russian shell company they established for the smuggling attempt.



Image 1. Some of the musk deer glands seized at Vladivostok Airport in 2018. Source: Far Eastern Operational Customs

Often, seizures of these two products are mixed, with passengers trafficking both musk deer products and bear bile (or bear gallbladders, both dried and fresh). For example, in November of 2016, a couple of passengers traveling to Seoul were arrested with musk deer glands and bear bile.^{vi} Also in 2016, a single Russian traveler was stopped en route from Yuzhno-Sakhalinsk Airport to Seoul with two dried bear gallbladders, 112 Siberian musk deer antlers, sturgeon caviar (CITES Appendix I or II), and chaga mushrooms hidden in his luggage.^{vii}

Russia is also home to several other vulnerable and endangered animal species which are in demand in Asia. These include the Amur tiger (CITES Appendix I), the saiga antelope (CITES Appendix II), and other mammals such as polar bears. These animals are also prized for their body parts, including their skins, claws, and teeth. Though the Russian government seeks to protect these animals from poaching, including through such high-profile measures as having President Vladimir Putin assist in tranquilizing and tagging individual Amur tigers,^{viii} these animals and their derivatives still show up in seizures at international airports.

Finally, Russia is the world's most significant source of mammoth ivory. Although the trade in mammoth ivory is not banned by any international convention, it is still controlled by Russia.^{ix} As a result, the cross-border trafficking of mammoth tusks is a significant challenge for Russian authorities, made more complicated by the fact that China allows commercial trade in mammoth ivory, as it is considered a potential substitute for ivory poached from elephants. Unfortunately, mammoth ivory is also a commonly used subterfuge for elephant ivory, as many customs agents are unable to tell the difference between the two. It seems that, given this loophole, Russia would be more frequently used as a place to "launder" elephant ivory tusks by pretending that they come from mammoths.

While a significant amount of the cross-border trade in mammoth ivory takes place by road or rail from Russia into China or South Korea, a considerable amount moves through airports. For example, in 2018, more than 200 kilograms of mammoth ivory were discovered in Krasnoyarsk Airport on the way to Moscow.^x A smaller seizure in the same airport in the same year involved one 25-year-old Russian individual transporting 10 kilograms of (mammoth) ivory which he reportedly planned to make into souvenirs.^{xi}

Overall, Russia appears to play a fairly significant role in supplying Asian demand markets with certain wildlife products, such as bear gallbladders, musk deer preputial glands, mammoth ivory, and sturgeon caviar. Still, wildlife trafficking in Russia seems to be relatively small-scale, although demand for mammoth ivory as a substitute for elephant ivory could incentivize larger, more organized trafficking networks to enter the mammoth trafficking trade. Finally, according to the C4ADS Air Seizure Database, most trafficking instances leaving Russia were destined for China or South Korea, which appear to be two of the largest demand markets for smuggled Russian wildlife.

IMAGE 3

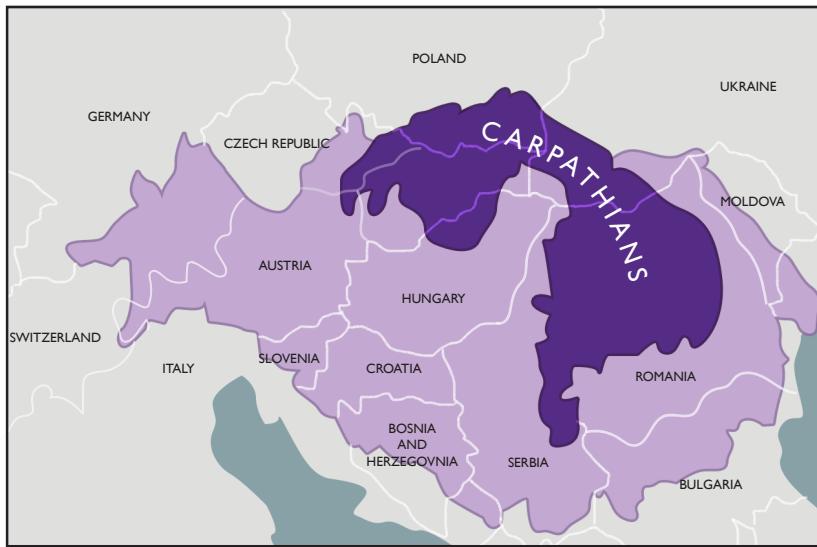


Image 3. The Danube – Carpathian region in Central and Eastern Europe. Source: WWF

At first glance, European countries seem to have made primarily live animal (reptile, bird, marine species, and mammal) seizures between 2016 and 2018, including proportionally more mammal seizures than any other world region. Most of Europe's mammal seizures, however, consisted of animal parts, such as skins, skulls, and meat, transiting through European airports on the way to Asia or carried home from abroad as macabre souvenirs.

Prominence of Germany

According to the C4ADS Air Seizure Database, Germany counted 27% more seizures than any other European country between 2016 and 2018, likely due to the combined effect of efficient enforcement and a relatively high volume of trafficking activity. Germany's seizure count was boosted by its role as a transit point for intraregional and international wildlife trafficking attempts taking advantage of German airports' diverse flight routes.

Importance of the pet trade

Many of the seizures visible in Figure 2 involved animals, particularly birds and reptiles, destined for sale as part of the European pet trade. A few of the reptile seizures highlighted the tendency of traffickers to smuggle animals from their natural habitats to destination markets for breeding and sale. For example, in early June of 2018, a 30-year-old Russian national was stopped on arrival from Madagascar in Domodedovo Airport in Moscow after an X-ray revealed 250 chameleons and geckos hidden in his backpack.^{xvii} He intended to breed and sell the animals, which were worth a combined total of about US\$30,000.

Another seizure emphasized the role that organized trade fairs can play in wildlife trafficking. In August 2016, a German man was arrested at Amsterdam Airport Schiphol on his way home from South Africa after customs officials found about 40 snakes, lizards, and other reptiles, some of which were endangered, packed in his suitcase.^{xviii} A number of the reptiles were already dead. He hoped to sell the animals, which were worth around US\$34,000 total, at a German reptile trade fair.

Involvement of Eastern Europe

Similar to Russia, wildlife trafficking in Eastern Europe receives comparatively little attention, even though Eastern European countries hold a significant portion of Europe's remaining wild areas. The Danube river basin and Carpathian forests in Central and Eastern Europe are reportedly home to two-thirds of Europe's remaining wild bears, wolves, and lynx, in addition to other threatened mammal, bird, and fish species, such as sturgeon.^{xix} The region's enduring biodiversity may help explain the appearance of some Eastern European countries in the European heat map.

For example, in October 2017 a Ukrainian man tried to smuggle three drugged and bound falcons in his luggage to Dubai.^{xxi} Four months later, a Qatari citizen tried to smuggle a saker falcon he had caught while hunting from Azerbaijan to Doha with forged paperwork and an export permit for poultry.^{xxiv}

Other seizures point to the importance of Eastern Europe as a transit area for live animals and wildlife products destined for Russia. In September 2017, a Russian man was on his way back from Vienna when he was stopped in Minsk Airport, Belarus with 54 snakes, 25 spiders, nine scorpions, and five lizards in his carry-on bag.^{xxv} Almost a year later in August 2018, another Russian man arrived in Moscow on a flight from Lithuania with two rhino horns in his hand baggage.^{xxvi}

FIGURE 2

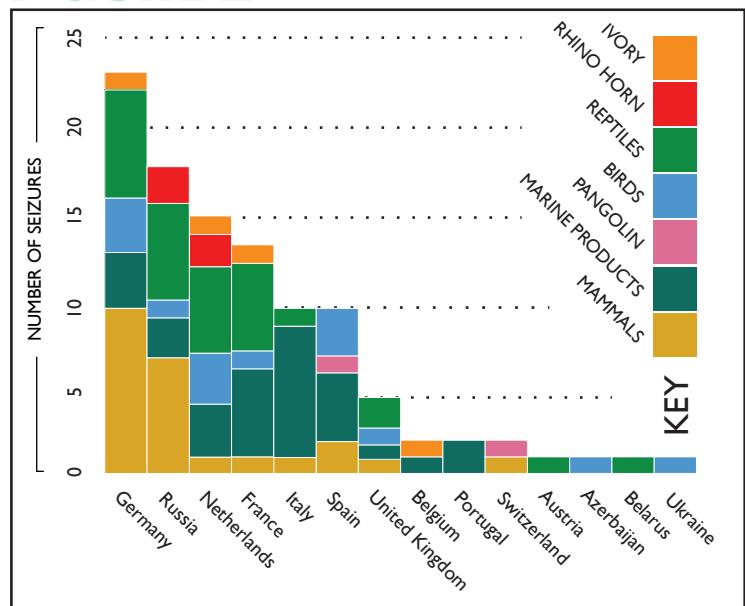


Figure 2. Total seizure count by European country (2016 – 2018)

European eel trafficking

European airports counted more seizures of marine species than of any other type of wildlife between 2016 and 2018, according to the C4ADS Air Seizure Database. Of the 29 marine species seizures in Table 5, almost half (13) involved live European eels on their way from Spain, Portugal, and other European countries to China or Vietnam.

FIGURE 3

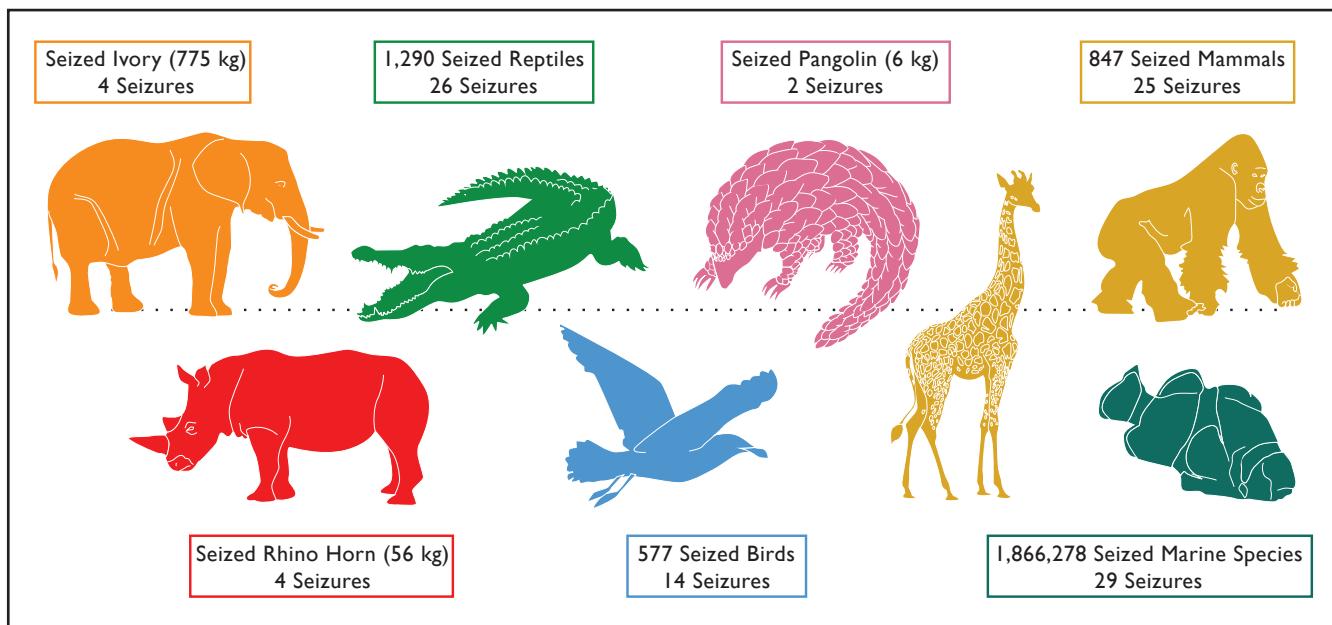


Figure 3. Number of seizures in Europe of each type of wildlife or wildlife product (2016 – 2018)

Of the 13 known European eel seizures within European airports between 2016 and 2018, only six had a reported estimate for the number of eels seized, but those six seizures alone involved at least 1,825,000 eels. Using an estimate of 3,000 eels per kilogram,^{xxii} all 13 seizures taken together could represent as many as 5,391,000 eels seized in Europe in a three-year period. This figure is particularly striking given that European eels are critically endangered throughout their habitat in Europe and around the Mediterranean. Furthermore, 10 of these 13 seizures occurred in 2018, suggesting European eel trafficking may be increasing. See **European Eel Trafficking** for more information.

SPANISH TURTLE FARM

Though Europe is not generally considered a hotspot for wildlife trafficking, occasional seizures reveal organized wildlife trafficking networks operating out of European cities at-scale.

For example, in February of 2017, Spanish Civil Guard officers in Palma de Mallorca Airport noticed that a shipment of turtles did not match the information provided in accompanying documentation.^{xx} A subsequent investigation led officials to an industrial turtle farm on the island of Mallorca, where investigators found more than 1,100 turtles (of which more than 200 were females soon to lay eggs) in poor conditions and over 750 eggs.^{xxi} The seized turtles included 14 highly endangered American, Asian, and African turtle species, including Chinese red-necked turtles, Malagasy radiated tortoises, and Vietnamese pond turtles.^{xxii} The network reportedly relied on couriers specializing in reptile and amphibian transportation to ship the turtles to Mallorca.^{xxiii}



Image 3. Video footage published by the Spanish Civil Guard showed dozens of turtles living outdoors in small, plastic containers. Source: Spanish Civil Guard
Officials later arrested two German men suspected of running the farm and a Spanish pet shop owner in Barcelona who reportedly “laundered” the farm-bred turtles through his exotic animal shop.^{xxiv} All three were charged with money laundering and endangered species trafficking. Another three individuals were also reportedly detained.^{xxv}

IVORY, RHINO HORN, AND PANGOLIN IN EUROPE

The near total absence of ivory, rhino horn, and pangolin seizures in Figure 2 likely reflects comparatively little demand for those products in Europe, and presents a clear contrast with wildlife trafficking in Africa, the Middle East, and Asia. Ivory trafficking instances, however, are far more numerous than ivory seizures in Europe (Figure 4),² reflecting the region's role as an occasional transit hub for wildlife products moving between Africa, particularly West Africa, and Asia.

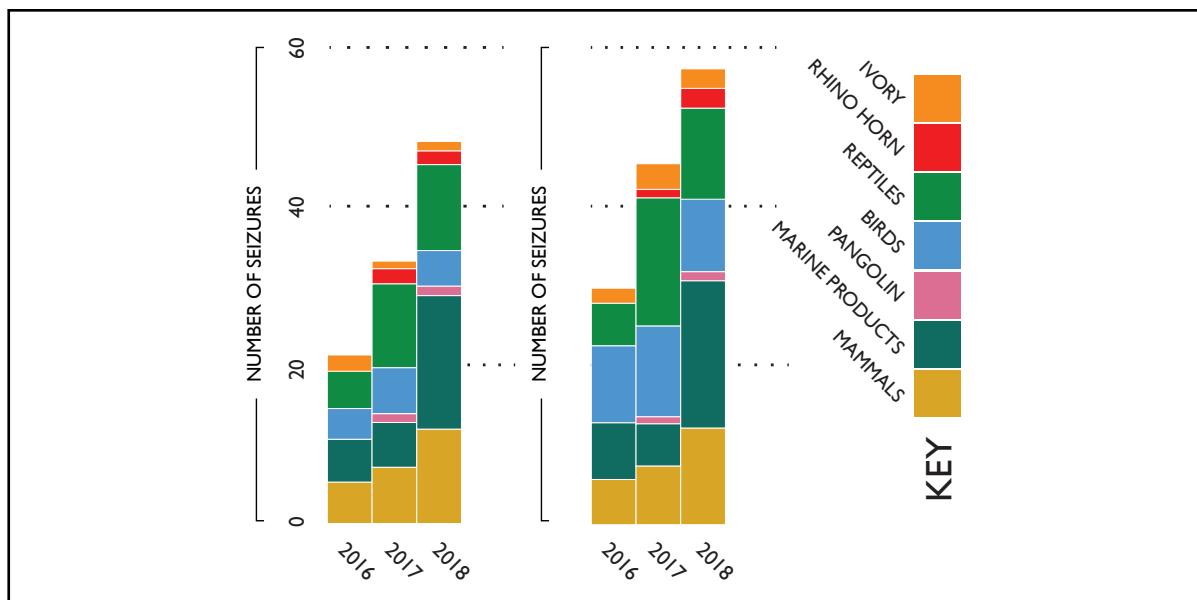


Figure 4. Seizure count and trafficking instance count by wildlife category (2016 – 2018)

To that point, of the known ivory (four), rhino horn (four), and pangolin (two) seizures made in European airports between 2016 and 2018, the majority (six) were stopped as they transited through Europe on their way to China, Vietnam, Lao PDR, or Turkey. Two of the rhino horn seizures were discovered in the possession of Russian nationals returning home, and both pangolin seizures involved the meat of several animals (including a monkey, a crocodile, and a porcupine) in the suitcases of individuals flying from West Africa to Europe. The meat was likely intended for consumption or sale in African markets (see **Europe & the Bushmeat Trade** in *In Plane Sight*).

Europe's apparent role as a transit hub for wildlife product (ivory, rhino horn, and bushmeat) trafficking seems to be confirmed by other recent media and NGO reports. For instance, a 2018 report by TRAFFIC found Belgium to be "a major intermediary in the illegal transport" of reptile meat, ivory, and seahorses.^{xxvi} The report stated that these products were mainly "coming from West and Central Africa, going to China and are being shipped through air transport and postal systems."^{xxvii}

In another well-known example, Czech officials discovered multiple groups of Vietnamese nationals operating rhino horn trafficking rings out of an Asian marketplace in Prague in the early-to-mid-2010s.³^{xxviii} Between 2010 and 2012, Czech authorities counted seven rhino horn thefts from museums and art galleries in the country. Around the same time, a number of rhino horn shipments leaving South Africa for Vietnam were stopped in South Africa. Shortly thereafter, South African rhino horn shipments began routing through the Czech Republic (see **Prague, Vietnam, & Wildlife Trafficking Networks** in *In Plane Sight*).

A later investigation revealed that Vietnamese nationals were paying Czech citizens, and eventually Czech professional hunters, to apply for rhino hunting permits in South Africa. After their hunts, the Czech hunters would either hand the horns over to a co-conspirator in South Africa or fly them back to the Czech Republic, giving them directly to the Vietnamese traffickers. Investigators at the time also found that the network (or networks) was increasingly diversifying to involve other European countries with little experience in detecting wildlife trafficking, and had been trading in not just rhino horn, but also tiger bones, ivory, drugs, cigarettes, bullets, and counterfeit goods.

In 2018, 15 individuals arrested in association with a 2013 seizure of 24 rhino horns were cleared of all charges by a Czech court.^{xxix} Only one defendant, Mao Nguyen Hue, received jail time (a two year suspended sentence) and a fine (600,000 Czech crowns, equivalent to about US\$27,000).^{xxx}

² There were four known ivory seizures in European airports between 2016 and 2018, compared to at least 10 ivory trafficking instances.

³ See Czech enforcement's report to CITES on this topic, titled "Trade in rhino horns in the territory of the Czech Republic," for detailed information on these networks, their operations, and their use of airports.

Czech Republic. "Trade in rhino horns in the territory of the Czech Republic: Report of Czech enforcement authorities." SC66 Doc. 51.I Annex 6. 2016. <https://cites.org/sites/default/files/eng/com/sc/66/ESC66-51-01-A6.pdf>.

FIGURE 5

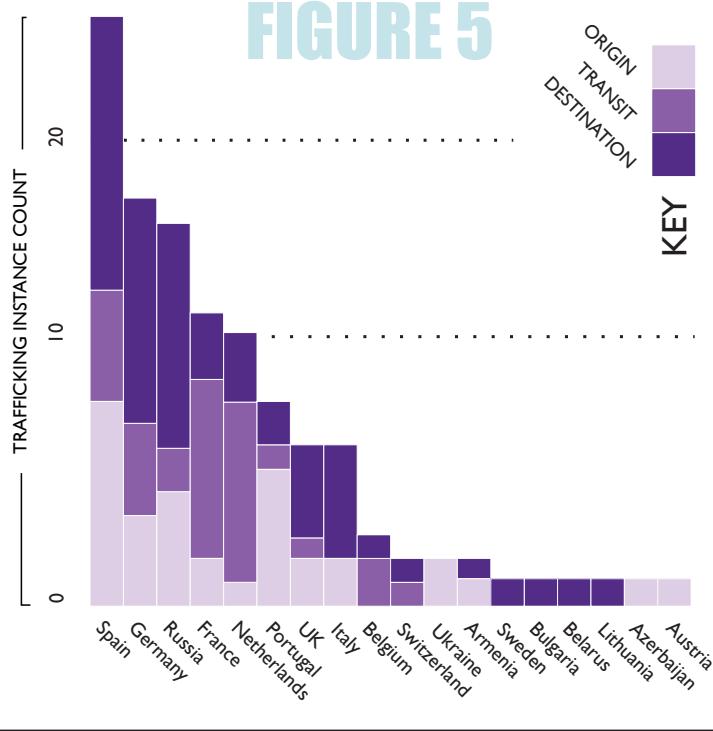


Figure 5. Country-level flight route information for European countries with one or more trafficking instance (2016 – 2018)

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

Perhaps the most striking aspect of European wildlife trafficking is the region's generally high seizure rates, regardless of each country's role (e.g. whether they were primarily origin, transit, or destination points) within wildlife trafficking supply chains.

High seizure rates

In general, countries with high seizure rates are destination countries for wildlife. These high seizure rates are usually driven by customs officials, who screen in-bound passengers and shipments and are therefore more likely to discover trafficked wildlife on arrival. This is reflected in the high seizure rates of some European countries, like Germany, Russia, Italy, and the UK, which were usually destinations for wildlife trafficking instances, according to the C4ADS Air Seizure Database.

However, many successful seizures occurred in non-destination countries as well, including prominent transit countries the Netherlands and France. Germany itself was almost evenly split between wildlife trafficking instances destined for the country and trafficking instances that originated in Germany or transited through.

Europe's high seizure rates suggest that with the right customs and enforcement mechanisms in place, making seizures on departure and in transit is possible.

FIGURE 6

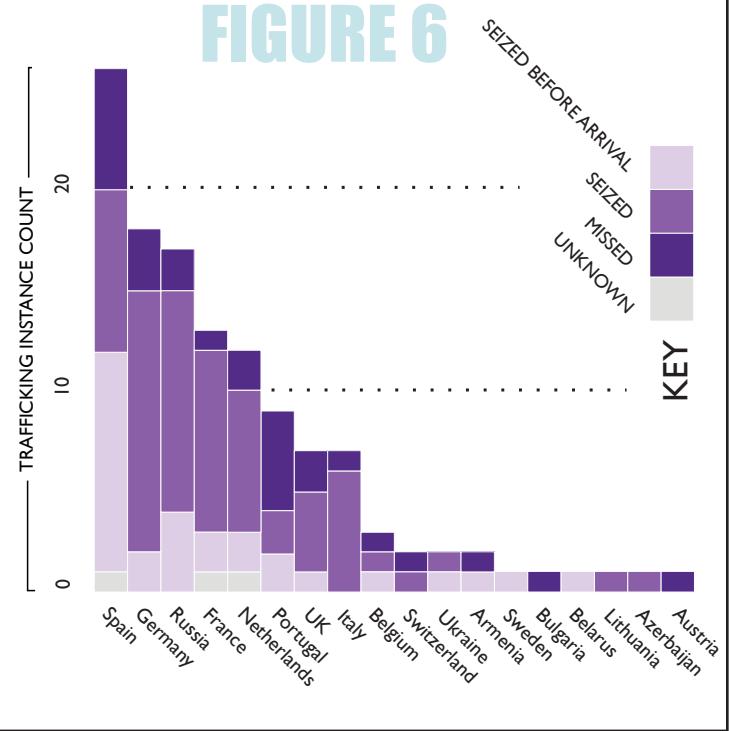


Figure 6. Point of seizure within the supply chain by European country (2016 – 2018)

Emergence of Portugal

Portugal appears in Figure 5 as the second-most common origin point for wildlife trafficked by air in Europe. The majority of Portugal's origin instances involved European eels destined for Vietnam or China and hidden in multiple suitcases in 2018.

Of all the countries in Figures 5 and 6, Portugal missed the highest proportion of wildlife trafficking instances. Of Portugal's eight known trafficking instances, only two were seized in Portuguese airports (both European eel trafficking attempts on their way to Vietnam in multiple suitcases). The others involved bird eggs, reptiles (snakes and lizards), ivory, and more European eels destined for either Asia (six instances), Portugal (one instance), or Brazil (one instance).

Prominent transit countries

All three major transit countries in Figure 5 – the Netherlands, France, and Belgium – acted as hubs connecting Africa and the Americas to Asia and other European destinations. Both France and Belgium acted as transit points for trafficking attempts moving from West Africa to Asia and Europe ([Ivory, Rhino Horn, and Pangolin Trafficking in Europe](#)), while the Netherlands was primarily used for trafficking instances leaving South Africa and the Americas for Asia. The importance of all three countries was driven by advantageous flight routes connecting common source regions and demand markets through their international airports.

DIFFICULTY OF MAKING SEIZURES IN TRANSIT

SECURITY SCREENING AT ORIGIN VERSUS CUSTOMS SCREENING AT DESTINATION

“Europe’s high seizure rates suggest that with the right customs and enforcement mechanisms in place, making seizures on departure and in transit is possible.”

FIGURE 7

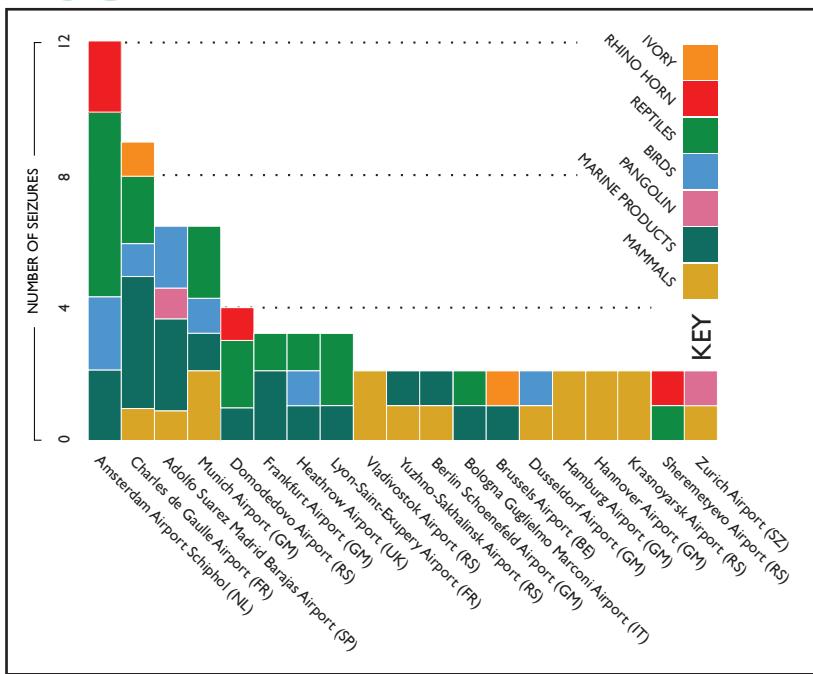


Figure 7. Airport seizure count for European airports with two or more seizures (2016 – 2018)

According to the C4ADS Air Seizure Database, wildlife seizures occurred in at least 47 airports within 15 European countries between 2016 and 2018. Seizures in some countries were split amongst several international airports. This was most clearly evident for Germany and Russia, both of which counted seizures in at least five airports.⁴

Mammal seizures

The 19 airports in Figure 7 made more mammal seizures between 2016 and 2018 than any other type of wildlife included within the C4ADS Air Seizure Database, with 48% of the top airports making at least one mammal seizure.

CROCODILES IN THE UK

Violating wildlife transport regulations is detrimental to the well-being of live animals and can result in the seizure of otherwise legal cargo. For example, on April 27, 2018, the UK Border Force seized an illegal shipment of 50 live saltwater crocodiles transported on a flight from Malaysia.^{xxxii} The 50 one-foot-long reptiles were stuffed into five boxes (ten in each) with sufficient room for only four. The cramped conditions led the crocodiles to compete for space during the long flight. One crocodile died while the remaining forty-nine received care before being rehomed.^{xxxiii} They were reportedly intended to be used for breeding at a meat farm in Cambridgeshire.

Although news reports of the seizure suggested the shipment was accompanied by a CITES permit, the packaging of the crocodiles did not conform with IATA's Live Animal Regulations,⁵ invalidating the permit and resulting in their seizure.^{xxxiii}

Marine species seizures

Of the top airports in Figure 7, 63% made marine species seizures. Most of these seizures involved European eels destined for Asia in 2017 and 2018.

Reptile seizures

Reptile seizures were also common in Europe between 2016 and 2018. Trafficked species included pythons, black mambas, chameleons, geckos, boas, turtles, and saltwater crocodiles from at least 18 countries, such as South Africa, Guinea, Mexico, the Solomon Islands, Brazil, Austria, Madagascar, and Algeria. Although the seizures collectively presented few discernible trends, most were smuggled in checked baggage or in passengers' carry-on items, and 81% of the seizures occurred in one of four countries: Germany (six seizures), the Netherlands (five seizures), France (five seizures), or Russia (five seizures).

Seizures concentrated in transit countries

The top two airports by seizure count, Amsterdam Airport Schiphol and Charles de Gaulle Airport, are the primary international airports in transit countries the Netherlands and France. The airports' high seizure counts likely reflect a combination of effective enforcement, high levels of trafficking activity, and good public seizure reporting protocols.



Image 5. Ten of the seized crocodiles in one of the boxes they were discovered in. Source: Press Association Images

IMPORTANCE OF TRANSIT HUBS

⁴German airports included Munich Airport, Frankfurt Airport, Berlin Schoenefeld Airport, Dusseldorf Airport, Hamburg Airport, and Hannover Airport, which accounted for 18 seizures total. Russian airports included Domodedovo Airport, Vladivostok Airport, Yuzhno-Sakhalinsk Airport, Krasnoyarsk Airport, and Sheremetyevo

⁵See www.iata.org/whatwedo/cargo/live-animals/Pages/index.aspx for more information. Airport which accounted for 14 seizures total. Airport which accounted for 14 seizures total.

FIGURE 8

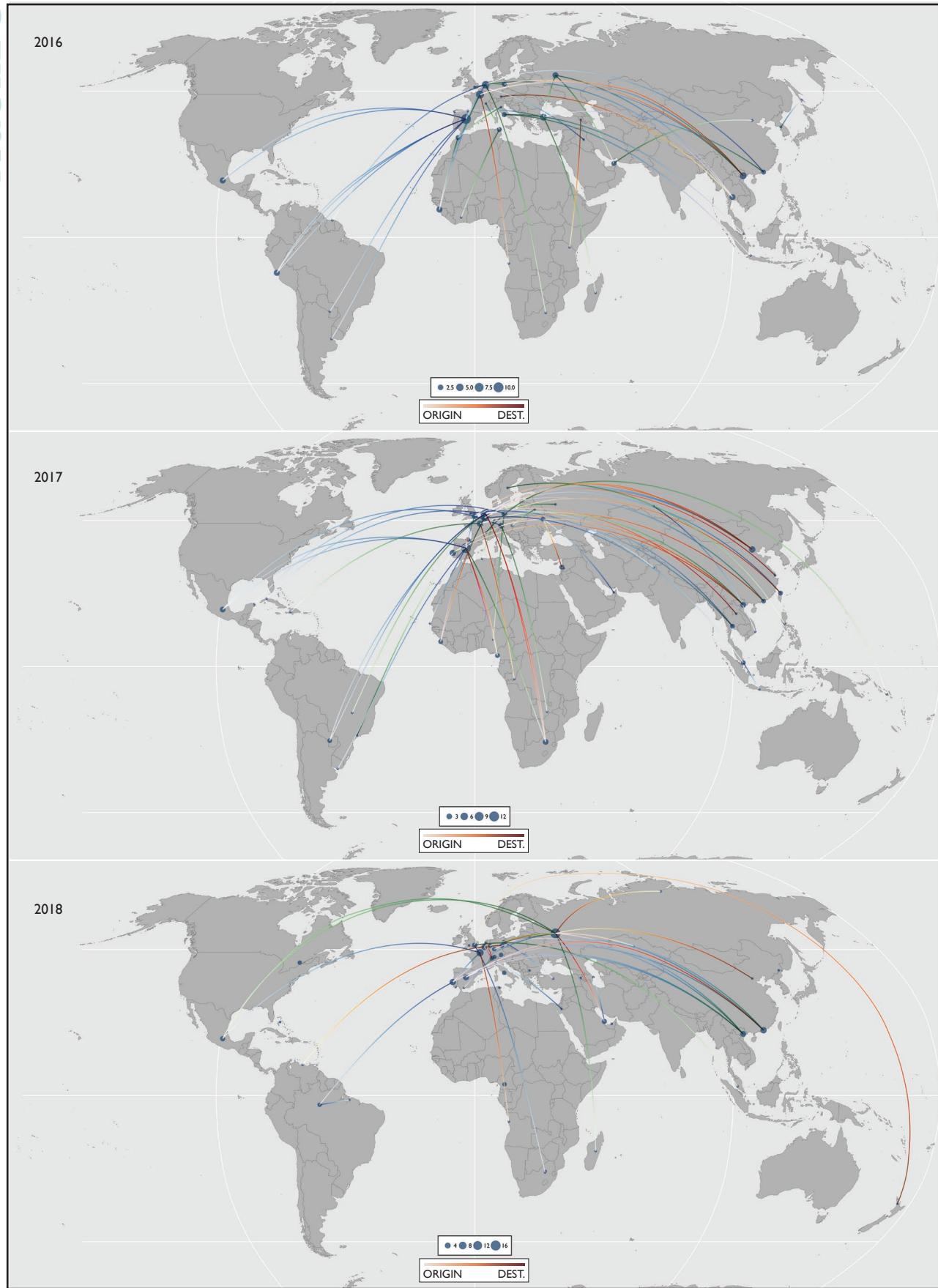


Figure 8. European air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city. Capital cities are used when specific airports are unavailable.

The European routes maps seem to reflect the region's role as both a transit and destination region for trafficked wildlife and wildlife products, with few trafficking instances originating in the area destined for other world regions.

Decline in bird trafficking instances

Bird trafficking instances, particularly instances originating in the Americas, appeared prominently in the 2016 and 2017 routes maps but seemed to decline in the 2018 map. This apparent drop in trafficking activity could reflect a real change in the frequency of bird trafficking, or it could be a side effect of a change in public seizure reporting, enforcement priorities, or trafficking methods. The decline did, however, coincide with the December 2017 arrest of 29 individuals linked to a Spanish bird trafficking network (see **Spain & Bird Trafficking** in *In Plane Sight*), suggesting that the change in the routes maps depicts a real drop in trafficking activity.

Transit region

Europe often functioned as a crossroads for wildlife trafficking moving between the major world regions, connecting source regions in the Americas and Africa with demand markets in Asia. Ivory and rhino horn in particular often flew through Europe (Germany, France, Belgium, and the Netherlands) on the way to Asia.

But European countries also functioned as common transit points for wildlife trafficking instances destined for Europe. C4ADS documented bird, pangolin, reptile, and mammal trafficking instances passing through European countries – often Spain, France, Germany, or the Netherlands – en route to other European destinations between 2016 and 2018. C4ADS also noted marine species instances originating in one European country and passing through a larger international airport in a second before heading to Asia.

European eel trafficking

The growing significance of European eel trafficking is clear in the European routes maps. While only one eel trafficking instance leaving Europe appears in the 2016 map and only three appear in 2017, 10 are visible in 2018 (a 900% increase between 2016 and 2018). See **European Eel Trafficking** for more information.

FIGURE 9

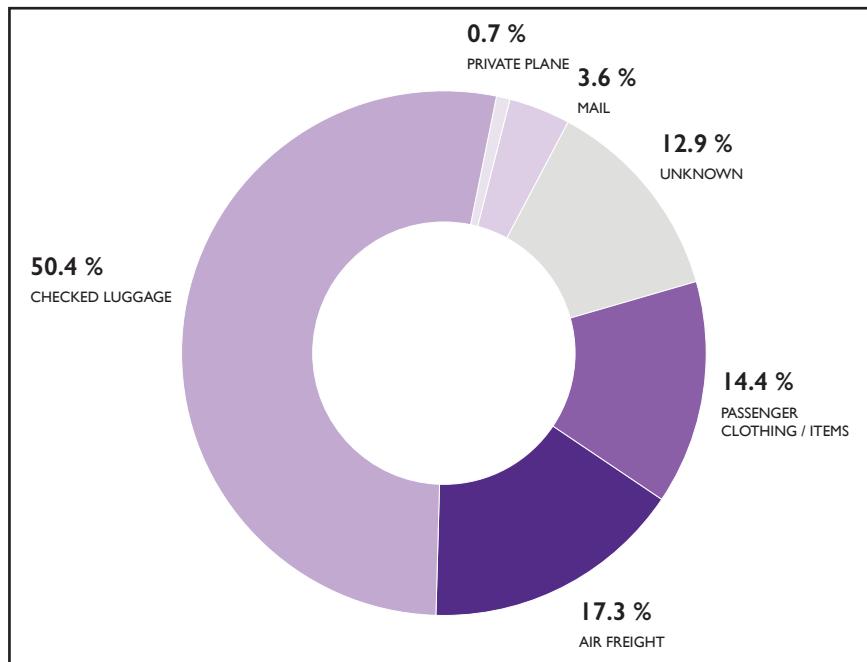


Figure 9. Transport methods for European trafficking instances in the air transport sector (2016 – 2018)

More than 50% of known wildlife trafficking instances in European airports between 2016 and 2018 were moved in checked luggage, probably reflecting the species and wildlife products that are most likely to originate in, pass through, or be destined for European countries. For example, birds, reptiles, European eels, and mammal skulls and skins, all frequently trafficked through Europe, are generally moved in checked bags. In contrast, ivory, pangolin scales, and specific marine species (e.g. abalone), all comparatively rare in Europe, are generally moved by air freight.

Comparatively few unknown seizures

In general, reporting for live animal seizures is more likely to include transport method information, perhaps due to perceived interest in the well-being of the animals. As a result, regions that experience more live animal trafficking will often have few seizures reported without transport method information. The Americas (12% of trafficking instances have no known transport method) and Europe (13%), for instance, tend to experience proportionally more live animal trafficking than Africa (17%) and Asia (18%).

This difference is visible within Europe as well. Of the live animal seizures made in Europe between 2016 and 2018 according to the C4ADS Air Seizure Database, 95% had known transport method information. In contrast, 84% of wildlife product seizures made in Europe during the same timeframe had transport method information.

TRANSPORT METHOD VARIES BY SPECIES

WILDLIFE TRAFFICKING BY MAIL LIKELY UNDERREPRESENTED

BIRD TRAFFICKING: A REPEAT OFFENDER

The 2018 arrest of a notorious and persistent bird trafficker showcased the ease with which many wildlife traffickers exploit the air transport sector with little consequence.

On June 26, 2018, UK Border Force officers stopped a 56-year-old man, Jeffrey Lendrum, arriving in Heathrow Airport from South Africa. When officers questioned and searched the passenger, they discovered 19 bird eggs and two newly-hatched vultures in a body belt around his abdomen.^{xxxiv} The birds included CITES-listed South African birds of prey, such as vultures, eagles, hawks, and kites. After the seizure, Lendrum pled guilty to four counts of fraudulent evasion of duty (i.e. importing protected goods) and was sentenced to 37 months in prison on January 10, 2019.^{xxxv}

Subsequent investigation into Lendrum's past revealed a long history of bird trafficking activity beginning in 1983.^{xxxvi} Lendrum has also been arrested in airports with bird of prey eggs on at least three occasions, including his 2018 arrest:

- On May 3, 2010, Lendrum was arrested at Birmingham Airport as he was about to board a flight to Dubai with 14 peregrine falcon eggs.^{xxxvii} Lendrum was convicted in 2011 to 30 months in prison (commuted to 18 months on appeal).
- On October 21, 2016, Lendrum was arrested in the Emirates Airlines lounge in Guarulhos Airport in Sao Paolo, Brazil with four albino peregrine eggs.^{xxxviii} He was passing through Guarulhos on the way from Santiago, Chile to Dubai in the UAE when he was caught. He was sentenced to 4.5 years in jail,^{xxxix} but was released on bail and escaped back to South Africa⁶ before serving his sentence.



Image 6. Jeffrey Lendrum on June 26, 2018 in Heathrow Airport.
Source: Press Association

Each of Lendrum's arrests occurred either due to suspicious activity or because of a tip-off. In Birmingham Airport, an airport employee noticed that Lendrum had spent a long time in an airport shower, but had left the shower completely dry.^{xl} The employee also discovered that Lendrum had left a cardboard carton containing a single dyed egg in a diaper bin. Assuming that Lendrum was up to something, the employee alerted police. In 2016, a hotel employee in Chile happened to Google Lendrum's name and tipped off local police, who relayed the information to airport authorities in Sao Paulo.^{xli} Finally, in 2018, Lendrum attracted enforcement officials' attention because he was wearing an unusually heavy coat on a hot day.^{xlii} When he was asked if he had anything to declare, Lendrum replied that he had "some fish eagle and kestrel eggs strapped to his body,"^{xliii} but claimed "he obtained the eggs from a man cutting down trees in South Africa."^{xliv}

Lendrum's behavior clearly illustrated that he and his associates prepared carefully for each trafficking attempt. For example, in February 2010, Lendrum or someone associated with him conducted reconnaissance of different locations in Sri Lanka before attempting to smuggle rare black shaheen peregrine falcons.^{xv} They prepared by mapping local geography and security force deployments, and conducted a thorough test of screening procedures at Colombo Airport. One of Lendrum's journals read, "A few meters inside doors to departure area there is a security checkpoint consisting of a row of standard baggage X-ray units, walk-through metal detector. The guy who patted me down was very good at it and had been well-trained."^{xlv}

Even though Lendrum has been arrested at least three times with bird eggs in airports, it does not seem that he ever wavered from his standard trafficking method, always personally carrying the contraband (as opposed to relying on couriers) and often using the same relatively rudimentary body wraps, while carrying associated gear such as mobile incubators and climbing gear that left little doubt about his activities.

Lendrum's tendency to carefully prepare for trafficking attempts, paired with his brazen and repeated use of the same trafficking method, suggests that he was usually successful, so much so that he did not feel the need to change his methods even after his arrests. After his current jail sentence is completed, however, Lendrum's continued success will likely hinge on enforcement's ability to list him as high-risk, either preventing him from traveling or subjecting him to additional screening wherever he goes.



Image 7. Some of the bird eggs discovered wrapped around Jeffrey Lendrum's torso in 2018.
Source: South West News Service

⁶Though Brazilian officials took Lendrum's passport from him after his arrest, Lendrum was allegedly able to leave Brazil by crossing the border into Argentina on foot, carrying a GPS and a backpack stocked with food and water. He then reportedly presented himself at the Irish embassy to get a new passport before flying on to Johannesburg, South Africa. Lendrum's Brazilian lawyer, however, told a reporter that it is more likely Lendrum "simply grabbed a bus across the border and flew home on his South African passport."

Source: <https://www.outsideonline.com/2378786/egg-thief-jeffrey-lendrum-falcon>

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MIDDLE EAST

MAIN TAKEAWAYS

The Middle East is a prominent transit region, particularly for wildlife and wildlife products trafficked between Europe, Africa, and Asia.

Middle Eastern countries can be destination countries for exotic live animals (e.g. cheetahs) and for falcons, particularly saker falcons.

Middle Eastern countries seem to make few wildlife seizures or publicly report few wildlife seizures, likely in large part due to the region's role as a transit hub and the difficulty of stopping trafficking instances in transit.

Flight routes for specific African wildlife products seem to rely on one Middle Eastern country more than the others (e.g. pangolins tend to fly through Turkey, rhino horn flies through Qatar, and ivory flies through the UAE). Knowing which types of wildlife products tend to fly through which airports can help enforcement target the transport methods most commonly used by traffickers of each product.

TRANSPORT METHOD VARIES BY SPECIES

FIGURE 1



Figure 1. Heat map of wildlife and wildlife trafficking instances in the Middle East's air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

The Middle East heat map primarily reflects the region's importance as a transit hub for wildlife trafficking by air.

Prominent transit countries

The most significant countries in the heat map (the UAE, Qatar, and Turkeyⁱ) are all major transit countries for wildlife and wildlife products moving between Africa, Europe, and Asia. According to the C4ADS Air Seizure Database, Dubai in the UAE and Doha in Qatar are two of the most prominent transit cities for wildlife trafficking by air in the world, with a significant portion of smuggled African wildlife and wildlife products passing through one or the other on the way to Asian destinations.

Although not as well-known as either the UAE or Qatar, Turkey also played an important role as a transit country for trafficking attempts flying from Africa or Europe to Asia between 2016 and 2018. Given the country's lower profile, traffickers passing through Turkey may be hoping to evade the extra scrutiny that flights originating in Africa and passing through Dubai or Doha face in certain Asian airports.

IMPORTANCE OF TRANSIT HUBS

Appearance of Syria and Iraq

The appearance of Syria and Iraq in the heat map is unexpected, given that neither country has a well-known wildlife market. But further examination of the two trafficking instances destined for each country reveals that the instances were stopped prior to arrival in Syria and Iraq. The Syrian trafficking instance involved a shipment of tiger cubs originating in Ukraine and ultimately destined for Samer al-Husainawi Zoo near Damascus, Syria in March 2017.^j The seizure only occurred because an NGO, Animals Lebanon, learned that the cubs had been held in Beirut Airport, Lebanon for a week but had not been given additional food or water (see **Tigers and Monkeys in Lebanon**).

The Iraqi instance involved 142 birds of various species leaving Maastricht Aachen Airport in the Netherlands for Iraq.^k The birds did not have the appropriate authorization to travel, and a Belgian national had already unsuccessfully tried to ship them once prior to their seizure in February 2016.

ⁱAlthough Turkey can be considered part of either Europe or the Middle East, it could not be included in both the European and Middle Eastern analyses. Because Turkey displayed many of the same characteristics as other Middle Eastern countries in the C4ADS Air Seizure Database, C4ADS chose to group Turkey within the Middle East for the purposes of this report.

THE MIDDLE EAST AS A TRANSIT REGION PARADIGM

As a prominent transit region, the Middle East experiences far more wildlife trafficking activity than it appears able to intercept. For example, wildlife trafficking instances in Middle Eastern airports over the past three years numbered at least five times more than wildlife seizures in those same airports over the same time period. The majority of these instances were later seized on arrival at their destination airports. As a result, the Middle East's seizure count is not a good indication of the region's true relevance to wildlife trafficking by air.

This phenomenon is clearly visible in the prevalence of ivory, rhino horn, and pangolin trafficking instances transiting through the region (36, 22, and 13 respectively) compared to only two ivory and rhino horn seizures each and no pangolin seizures over the same timeframe.

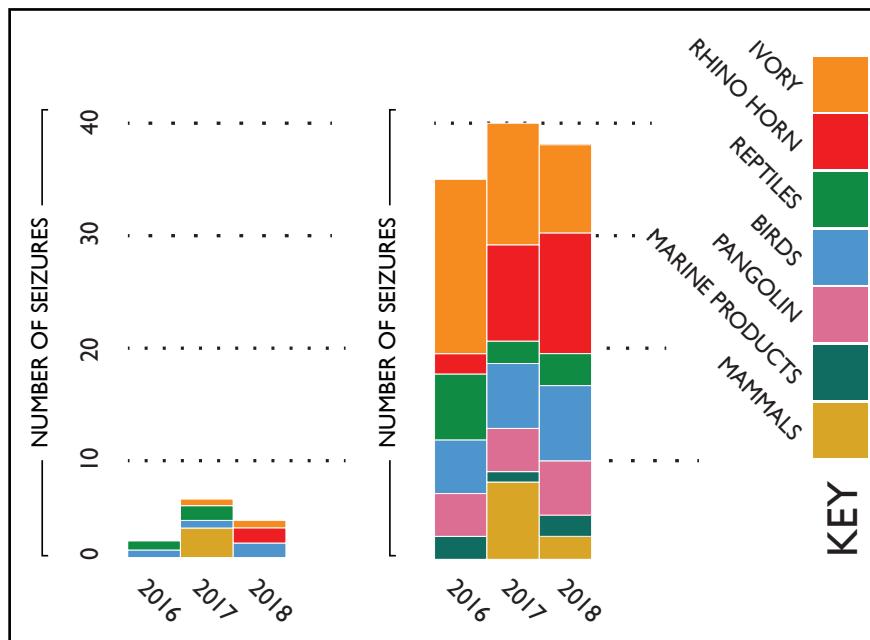


Figure 2. Seizure count and trafficking instance count by wildlife category (2016 – 2018)

FIGURE 3

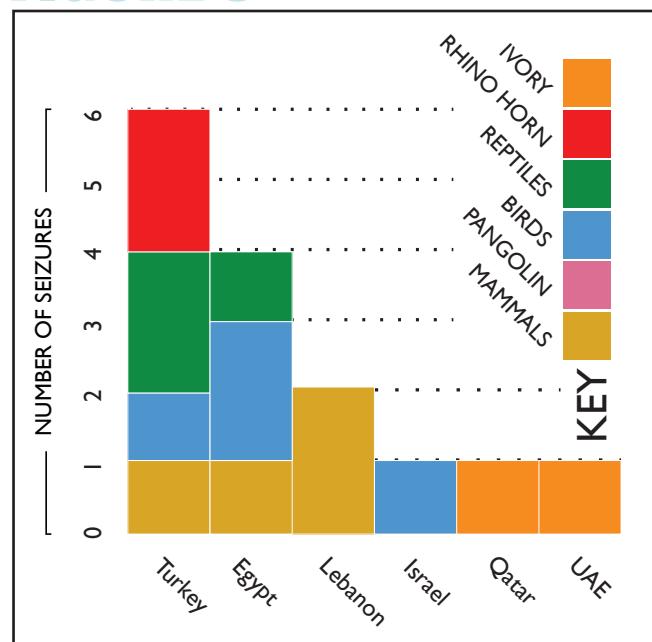


Figure 3. Total seizure count by Middle Eastern country (2016 – 2018)

According to the C4ADS Air Seizure Database, Middle Eastern countries made few seizures in the air transport sector between 2016 and 2018. The countries' low seizure counts are indicative of the Middle East's status as a prominent transit region.

Difficulty making seizures in transit

Turkey ranked first by seizure count between 2016 and 2018, with more reported seizures than the UAE and Qatar combined. Turkey's comparatively high seizure count is not driven by its status as a significant transit country for trafficked wildlife and wildlife products, however; the majority of known wildlife seizures made in Turkey between 2016 and 2018 were destined for the country. Turkey's seizures were therefore likely discovered as they passed through customs screening on arrival.

The only seizure Turkish officials made in transit that was captured in the C4ADS Air Seizure Database involved 34 kg of rhino horn on a Turkish Airlines flight from Mozambique to Vietnam.ⁱⁱⁱ The seizure occurred after previous flights taken by the Vietnamese trafficker smuggling the horns raised red flags in Ataturk Airport's Intelligence Information System. The success of this seizure emphasizes the importance of relying on red flag indicators and emerging technologies to reduce time and manpower constraints inhibiting effective screening of passengers and cargo in transit.

FIGURE 4

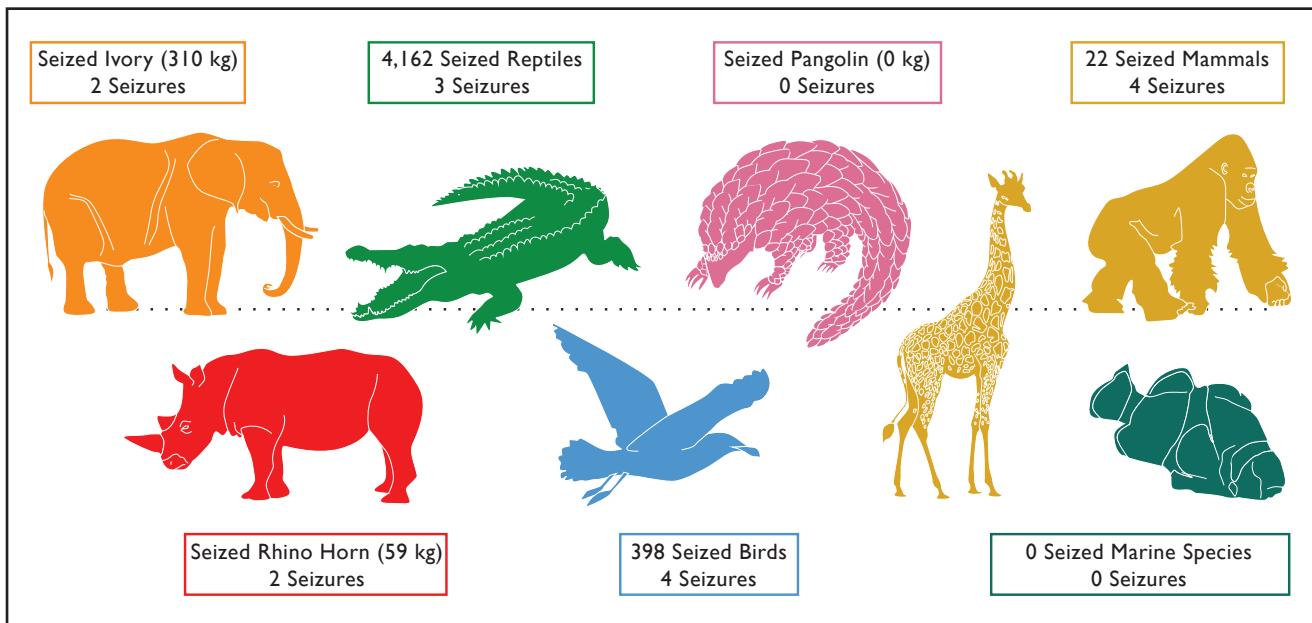


Figure 4. Number of Middle Eastern seizures displayed by type of wildlife or wildlife product seized (2016 – 2018)

Appearance of Egypt

Between 2016 and 2018, Egyptian authorities in Cairo Airport made four known wildlife seizures, ranking second in Figure 3 amongst Middle Eastern countries by seizure count. At least three of the seizures suggested that Egypt may function as an origin point or a “gateway” to live animal markets in other Middle Eastern countries.

Both Egyptian bird seizures in Figure 3 involved falcons leaving Cairo for sale in Bahrain. In one seizure, traffickers sewed shut the eyes of the peregrine falcons they were transporting (see **Falcon Smuggling & Corruption**).² The Egyptian mammal seizure occurred after a “Gulf national” was caught smuggling two lion cubs in boxes to “a Gulf country.”^{iv} He claimed they were domestic kittens and provided authorities with falsified paperwork claiming he had purchased them in a pet shop, but later admitted he had purchased them from a circus in Marsa Matruh.

IMAGE 1



Image 1. Two lion cubs purchased from a lion trainer at a circus in Egypt and found in the possession of a Gulf national attempting to export them from Cairo. Source: Al-Ahram Arabic

²Similarly, the Egyptian reptile seizure in Figure 35 involved 60 venomous Egyptian cobras found in ice-packed boxes, also with their mouths sewed shut. Source: Kous, Dima Abo. “Smuggled Cobras Rescued at Cairo Airport Thanks to Our Trainings.” International Fund for Animal Welfare. 9 May 2016. www.ifaw.org/united-states/news/smuggled-cobras-rescued-cairo-airport-thanks-ourtrainings.

FALCON SMUGGLING & CORRUPTION

Falcon trafficking is common in the Middle East, where wealthy members of the Middle Eastern elite, often royalty or government officials, collect falcons to hunt (usually illegally) and compete in various contests. Though captive-bred falcons can often be sold legally, falcon trafficking remains prominent in the Middle East due to a persistent belief that wild birds are more successful hunters than captive-raised birds.^v As a result, birds are often caught along the coasts of the Mediterranean, Red, and Arabian Seas^{vi} and passed into the illegal wildlife trade before being illegally sold to falconers in and around the Arabian Peninsula. Falcons are so prized by their owners in the Middle East that Bentley recently released the Bentayga Falconry, a car with a perch positioned between the two front seats and a “Master Flight Station” designed to hold a “GPS bird tracking unit, binoculars, and hand-crafted leather bird hoods and gauntlets.”^{vii}

Because so much of the illegal falcon trade involves Middle Eastern elites, there is likely a fair amount of corruption involved in many falcon trafficking attempts, from airport employees who turn a blind eye to a smuggling attempt involving an elite, to the traffickers themselves, to the individuals receiving the birds and flying them back and forth to falconry camps and competitions.

For example, in October 2016, Egyptian officials in Cairo Airport X-rayed bags belonging to an Egyptian passenger and discovered 41 peregrine falcons, prized for their speed and hunting ability, bundled up and drugged with their eyes sewn shut.^{viii} Officials arrested the passenger, who was allegedly flying to Bahrain to sell the birds “to princes in the Gulf region,” along with a police officer in the Cairo Security Directorate and three lower-ranking police officers in Cairo Airport that he had bribed.^{ix}

In another seizure a year later, Pakistan officials in Allama Iqbal Airport in Lahore searched the airport in response to a tip-off about a bird smuggling attempt.^x The officials discovered nine falcons hidden in a carry-on bag owned by a Qatari citizen, Ali Muhammad Al-Sada. He was attempting to board a private flight back to Qatar at the time of the seizure.



Image 2. A hooded falcon standing on the perch of a Bentley Bentayga Falconry. Source: Gentleman’s Journal



Image 3. One of 41 peregrine falcons destined for sale in Bahrain. The birds had been drugged and had their eyelids sewn shut. Source: IFAW

FIGURE 5

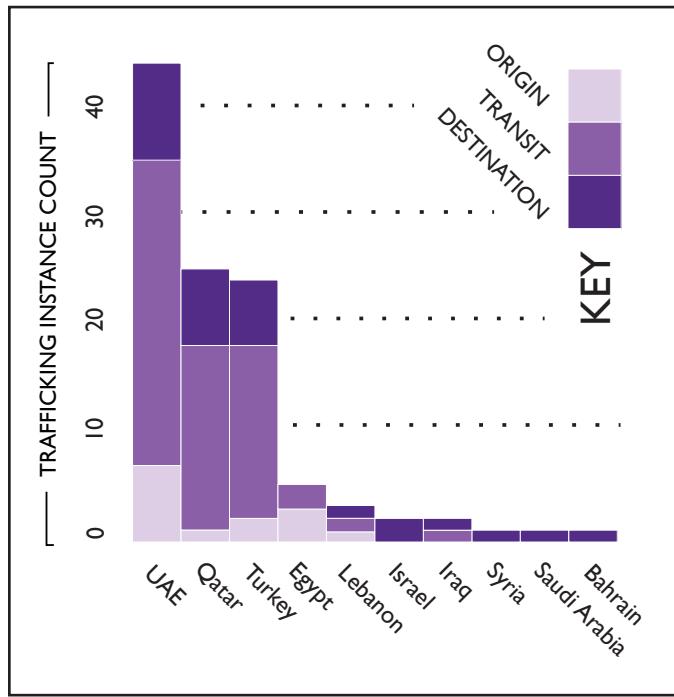


Figure 5. Country-level flight route information for Middle Eastern countries with one or more trafficking instances (2016 – 2018)

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

The role of the Middle East as the world's most prominent transit region for wildlife trafficking by air is clearly on display in Figures 5 and 6, with the UAE, Qatar, and Turkey experiencing primarily transit instances. In fact, transit instances accounted for 63%, 69%, and 67% of the trafficking instances involving the UAE, Qatar, and Turkey respectively. Airports in Egypt, Lebanon, and Iraq were also used as transit points by wildlife traffickers between 2016 and 2018, albeit to a lesser extent.

Transit hubs as origin points

Each of the primary transit countries in Figure 5 – the UAE, Qatar, and Turkey – all count at least one origin instance. While it is possible that these represent the attempted trafficking of native species or of non-native animals living in the Middle East, it is also possible that these origin instances involved live animals or wildlife products that were being smuggled through each country in two separate trafficking attempts.

Some traffickers are careful to obfuscate the true origin of their shipments by storing them in a transit location – such as in a warehouse or with an exotic animal trader – for days to months at a time. Dividing flight routes in this way may help to reduce authorities' perceived risk of a shipment arriving at its destination, thereby reducing the chances it will be stopped and closely scrutinized. For example, Chinese authorities are well aware that flights arriving from South Africa and Mozambique may carry rhino horns, and so often perform enhanced screening on passengers and shipments disembarking from those flights. Flights arriving from Qatar, however, are not necessarily considered high-risk for rhino horn trafficking attempts, and so may undergo less rigorous screening for wildlife products

FIGURE 6

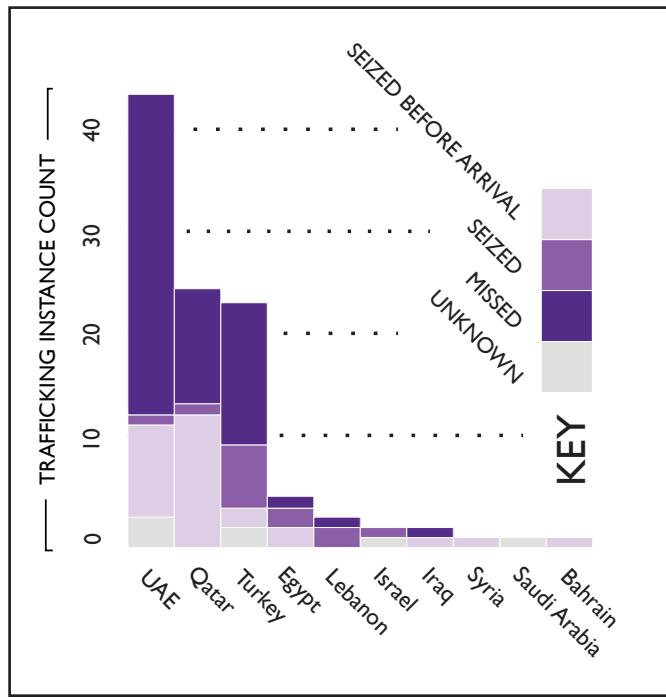


Figure 6. Point of seizure within the supply chain by Middle Eastern country (2016 – 2018)

IMPORTANCE OF TRANSIT HUBS

Further inspection of the Emirati, Qatari, and Turkish origin instances in Figure 5 reveal that they are likely a mix of both genuine origin instances and delayed trafficking instances. Many involved falcons native to the Middle East on their way from the UAE or Qatar to Pakistan. Others involved non-native species, such as red-eared slider turtles and gray parrots, and wildlife products derived from non-native animals.

Appearance of Saudi Arabia, Bahrain, and Israel

Saudi Arabia, Bahrain, and Israel all appear in Figure 5 as destination countries due to domestic demand for live animals, particularly reptiles and birds. For example, Saudi Arabia was listed as the intended destination of a trafficker carrying 10 live juvenile pythons in socks and plastic bags on a Garuda Indonesia flight.^{xii} Bahrain was the intended destination of 41 drugged and bound peregrine falcons found in the luggage of an Egyptian trafficker (see **Falcon Smuggling & Corruption**).^{xiii} Israel's trafficking instances in Figure 5 involved both birds and reptiles. In the first seizure, Israeli officials intercepted two Israeli traffickers in Ovda Airport on arrival from Milan, Italy in November 2018 after receiving a tip off.^{xiv} The officials found eight Gouldian finches in bird cages hidden in the traffickers' suitcases. One month later, German customs officers stopped a male passenger with a strange bulge in his pants on his way to Israel.^{xv} Further inspection revealed that he had placed a boa in a cloth bag and hidden the bag in his pants.

DIFFICULTY OF MAKING SEIZURES IN TRANSIT

Low seizure rates

Of the Middle Eastern countries featured in Figure 6, only Lebanon and Egypt seized more trafficking instances than they missed. The UAE and Qatar, the two most significant Middle Eastern countries by trafficking

IMAGE 4



Image 4. Eight Gouldian finches discovered in the suitcase of a trafficker flying from Italy to Israel. Source: Israel Nature and Parks Authority

instance count and the most common transit countries in the region, had particularly low seizure rates (2% and 4% respectively), reflecting the difficulty of making seizures in transit.

Note that Dubai Airport tends to report three or four months of seizures in one press release, without describing individual seizures and only referencing combined totals. This format prevents the incorporation of those seizures into the C4ADS Air Seizure Database, and may lead to an artificially low seizure count for the UAE.

Comparatively high seizure rate in Lebanon

Lebanon was the only Middle Eastern country in the C4ADS Air Seizure Database to stop the majority of the known trafficking instances linked to its airports (see **Tigers and Monkeys in Lebanon**). Lebanon only counted three trafficking instances total in its airports between 2016 and 2018, however, so this seizure rate could reflect chance more than a heightened ability to intercept trafficked wildlife.

IMAGE 5



Image 5. A boa stuffed in a cloth bag and hidden in a passenger's pants.
Source: German Main Customs Office Shonefeld

Seizures before arrival in Qatar

Of the trafficking instances linked to Qatar between 2016 and 2018, 54% were seized prior to arrival in Qatar. This suggests that Qatari trafficking instances may be passing through airports with particularly effective enforcement before arriving in Qatar, perhaps along a few commonly used routes. But no clear pattern emerged in the data; the 14 trafficking instances seized prior to arrival in Qatar originated in nine different countries, and involved everything from rhino horn to pangolin scales and falcons. The instances did, however, involve more falcons and rhino horn than any other species or wildlife product, and were seized in either an African country (Mozambique, Nigeria, Morocco, South Africa, or Uganda) or an Asian country (Kazakhstan, Azerbaijan, Pakistan, or Indonesia). These nine countries do act as common origin points for certain trafficked species, and so perhaps have higher awareness of their exposure to wildlife trafficking, giving enforcement a heightened ability to identify smuggled wildlife on departure.

TIGERS & MONKEYS IN LEBANON

Between 2016 and 2018, Lebanon officials made only two known wildlife seizures in the country's airports. Both seizures involved live animals shipped in poor conditions.

In the first seizure in March of 2017, a Lebanese NGO, Animals Lebanon, alerted the Lebanese Ministry of Agriculture and Customs to a shipment of three tigers cubs arriving in Beirut Airport from Ukraine.^{xv} The owner of the shipment presented paperwork and permits for the cubs, stating that they were due to fly out again the day after their arrival on a ShamWings flight to Syria (ShamWings, however, allegedly told Animals Lebanon that they did not have the appropriate planes for live animal transport).^{xvi}

The cubs did not fly out the next day as promised, and instead spent seven days sitting in the small crate they had arrived in in Beirut Airport. The crate did not comply with IATA's Live Animals Regulations (LAR) – it was too small, did not have absorbent bedding, and did not include appropriate food and water containers.^{xvii xviii} The bottom of the crate also became increasingly covered in maggots as the cubs remained confined within it. Note that CITES permits require that IATA's LAR be met, or else the permit becomes invalid.^{xix}

IMAGE 6



Image 6. Three tiger cubs held at Beirut Airport, Lebanon for a week. Source: AFP

After seven days, a judge ordered the release of the cubs to Animals Lebanon "because of significant concerns for their health and welfare."^{xx}

Five months later, Lebanese officials discovered two rare white-throated guenon monkeys (CITES Appendix II) in a cat crate.^{xxi} The monkeys had flown from Accra, Ghana through another transit location or two before arriving at Beirut Airport, allegedly multiple days after they had left Ghana. They were not given food or water for the trip. Animals Lebanon took the monkeys in after their arrival and said they were in "terrible shape."^{xxii} The monkeys are believed to be the only whitethroated guenons outside of the species' normal habitat in Nigeria and Benin.

FIGURE 7

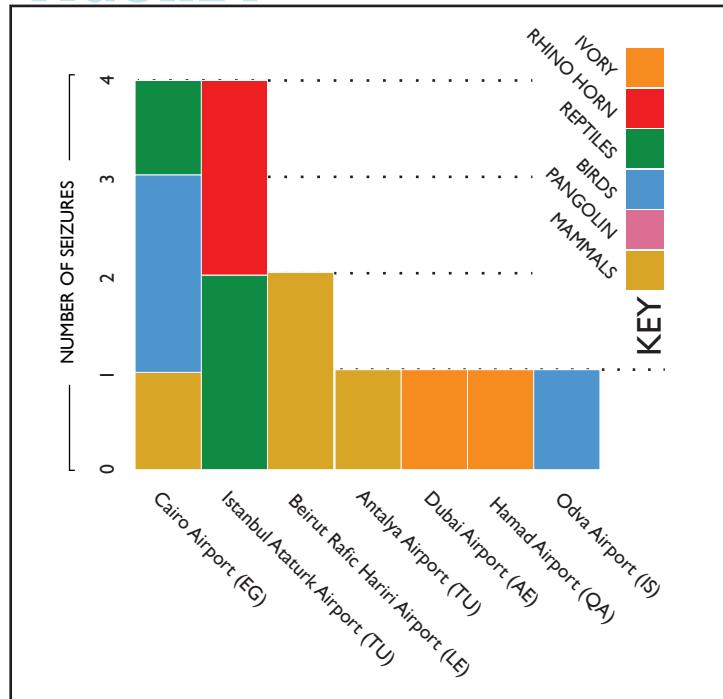


Figure 7. Airport seizure count for Middle Eastern airports (2016 – 2018)

Few Middle Eastern airports made wildlife seizures between 2016 and 2018, with seizures concentrated in primarily two countries, Turkey (five seizures)³ and Egypt (four).

Lack of identifiable patterns likely reflects Middle East's status as a transit region

No clear trends are visible in Figure 6, with each airport making too few seizures to portray any real pattern.

A slight emphasis on mammal seizures is visible, however, with three Middle Eastern airports counting at least one mammal seizure between 2016 and 2018. All four involved animals likely destined for the Middle Eastern pet trade. Three involved exotic wild animals (lion cubs, tiger cubs, and white-throated guenons), while the fourth involved 15 Scottish fold and Scottish straight house cats smuggled in the carry-on bags of tourists entering Turkey.^{xxiii} Seven of the cats died en route due to a lack of oxygen.

Seizures may not be publicly reported

The exotic pet trade and the falconry trade are both wellknown in the Middle East, and yet Figure 6 only counts four mammal seizures and two bird seizures reported publicly in the region in three years. The absence of seizures suggests seizures are either not occurring or that reporting is relatively limited.

Most exotic pets and falcons that are smuggled into Middle Eastern countries are purchased by wealthy members of the Middle Eastern upper class, including royalty. This could put pressure on customs and enforcement authorities within airports to turn a blind eye to suspect shipments (see **Falcon Smuggling & Corruption**). It is also possible that existing regulations allowing for the movement of falcons with the correct documentation provide a gray area that prevents authorities from easily differentiating between legal falcon movements and illicit falcon trafficking.

IMAGE 7



Image 7. Three of the kittens discovered on arrival in Antalya, Turkey. Seven of the kittens had died en route. Source: AA Photo

³Reports of the sixth seizure made in Turkey between 2016 and 2018 (African grey parrots flying between the DRC, Turkey, and Iraq) did not include airport information.

FIGURE 7

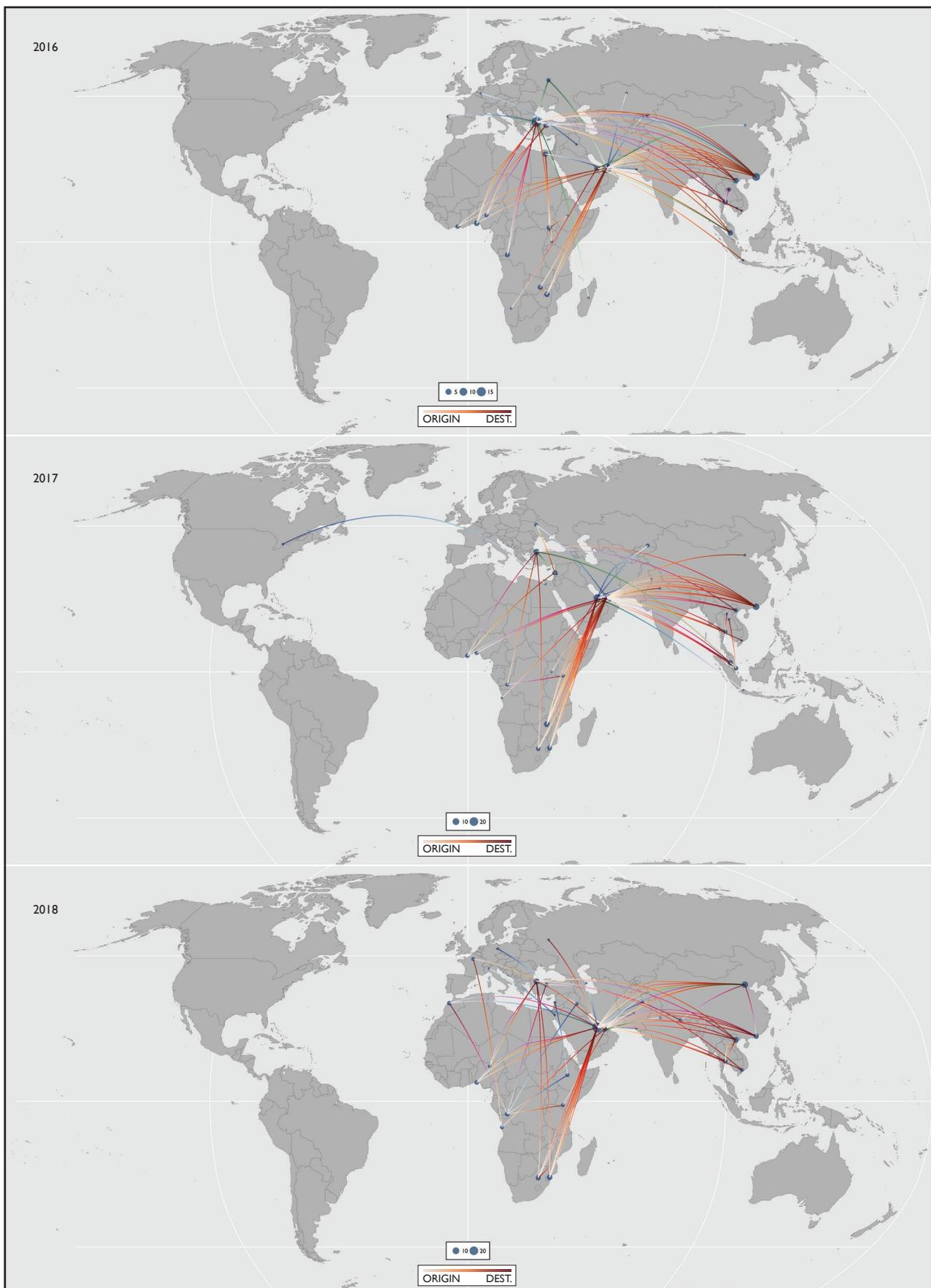


Figure 7. Middle Eastern air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city.
Capital cities are used when specific airports are unavailable.

The Middle Eastern routes maps look like simplified versions of the African routes maps, missing only Africa's direct flights between East and Southern Africa and Asia. This similarity reflects the use of the Middle East as a stepping stone to Asian destinations by wildlife traffickers operating in Africa.

Importance as a hub connecting Africa and Asia

Most of the flights flying into the Middle East from Africa continued on to Asian destinations. This was particularly true for flights used to smuggle ivory, rhino horn, and pangolin from West, Central, and Southern Africa. Rather than flying into a wide array of Middle Eastern airports to avoid detection, however, these trafficking instances almost always flew into one of three Middle Eastern cities: Dubai in the UAE, Doha in Qatar, and Istanbul in Turkey. This near constant reliance on the same three cities was most likely driven by necessity – Dubai Airport, Hamad Airport, and Istanbul Ataturk Airport (now Istanbul Airport) are the three busiest airports in the Middle East, and so probably offer the most flights and flight routes between the Middle East and other world regions.

Certain wildlife products seem to favor certain transit countries

The Middle Eastern routes maps suggest that certain African wildlife products flew through one transit country more frequently than any others between 2016 and 2018. Seizure data contained within the

C4ADS Air Seizure Database reveal a similar trend, with ivory, rhino horn, and pangolin trafficking instances all tending to favor one Middle Eastern country over the rest. For example, pangolin trafficking instances flew through Turkey more often than any other country in the region, accounting for 62% of pangolin instances transiting through the Middle East.⁴ In contrast, rhino horn flying through the Middle East passed through Qatar 68% of the time, and ivory flew through the UAE 61% of the time.

The differences in the flight routes used by ivory, rhino horn, and pangolin traffickers between 2016 and 2018 were likely a result of slight differences in the origin and destination points for each. According to the C4ADS Air Seizure Database, ivory usually flew out of East, Central, West, or Southern Africa for Hong Kong, China or Kuala Lumpur, Malaysia, while rhino horn almost exclusively flew out of Southern Africa for Hong Kong or Vietnam. Pangolin often flew out of West or Central Africa for China, Vietnam, or Lao PDR.

IMPORTANCE OF TRANSIT HUBS

Birds destined for and leaving from the Middle East

One clear difference between the African and Middle Eastern routes maps is the appearance of multiple bird trafficking instances flying between the Middle East, Central Asia, and Eastern Europe. Many of these bird trafficking instances involved falcons smuggled between the UAE, Turkey, Qatar, Bahrain and several Central Asian countries such as Pakistan and Kazakhstan.^{xxiv xxv}

FIGURE 8

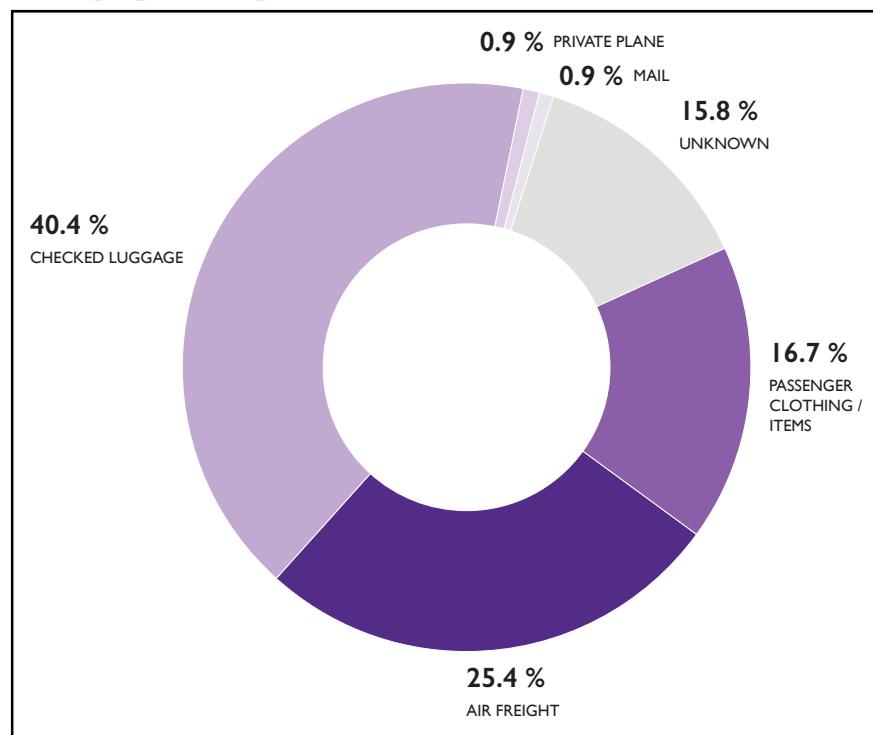


Figure 8. Transport methods for Middle Eastern trafficking instances in the air transport sector (2016 – 2018)

Although checked luggage was the most commonly used transport method in the Middle East between 2016 and 2018, it was slightly less significant there (40% of instances moved in checked luggage) than in most other world regions (42% on average), with the exception of Oceania (26%). At the same time, air freight and passenger clothing/items were comparatively more important in the Middle East, with more Middle Eastern trafficking instances concealed in air freight or passenger clothing/items than in any other world region.

Prevalence of air freight

The significance of different transport methods in the Middle East was largely dependent on the types of wildlife trafficked there, according to the C4ADS Air Seizure Database. For example, of the air freight instances that passed through the Middle East between 2016 and 2018, 69% were either ivory or pangolin scale trafficking attempts on the way from Africa to Asia. Air freight was less commonly used in regions where neither ivory nor pangolin scale trafficking attempts were common (i.e. the Americas, Europe, and Oceania).

WILDLIFE TRAFFICKING BY MAIL LIKELY UNDERREPRESENTED

⁴Note that the regional focus of this section may be affecting the analysis – it is possible that these wildlife products more frequently transit through African or European airports than the airports mentioned here.

Prevalence of passenger clothing/items

According to the C4ADS Air Seizure Database, ivory trafficking instances made up 53% of the trafficking attempts hidden in passenger clothing or items in the Middle East between 2016 and 2018. The vast majority of these ivory seizures occurred in or were destined for China.

In Africa and Asia, trafficking instances moved by passenger clothing/items seemed to be associated with an increase in small-scale (less than one kg) ivory trafficking attempts. In the Middle East, however, ivory trafficking instances carried by passengers or placed in their carry-on bags generally weighed around 20 kg. Further investigation revealed that the vast majority of these instances were linked to a particular ivory trafficking network, dubbed “The Handmade Vest Network” for the purposes of the ROUTES reports, operating between Harare, Zimbabwe; Dubai, UAE; and Hong Kong, China since at least 2015 (see **Handmade Vests case studies** in *Flying Under the Radar* and *In Plane Sight*).

Rhino horns in checked luggage

Of the Middle Eastern trafficking instances moved in checked luggage between 2016 and 2018, 28% involved rhino horns flying from Southern Africa to Asia, usually onboard Turkish Airlines or Qatar Airways. While some rhino horns were placed directly inside a suitcase, others were cut into pieces, wrapped in tin foil, and hidden within industrial machinery or cans of food.

WILDLIFE PRODUCT PROCESSING INCREASINGLY OCCURS IN SOURCE REGIONS

IMAGE 8



Image 8. Rhino horn pieces painted white, wrapped in tin foil and hidden inside powdered milk formula cans in two suitcases. Source: Vietnamese Customs

IMAGE 9



Image 9. Rhino horn pieces painted black and hidden inside food packaging. Source: Hong Kong Customs and Excise Department

Endnotes

- i "Baby tigers stuck at Beirut airport freed after judge order." Animals Lebanon, 17 March 2017. <http://www.animalslebanon.org/news/baby-tigers-stuck-at-beirut-airport-freed-after-judge-order>.
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OCEANIA

MAIN TAKEAWAYS

Publicly reported air seizures are uncommon in Oceania.

Oceania's endemic biodiversity suggests it is or will be used as a source region for wildlife traffickers, particularly for the reptile, bird, mammal, and marine species trades.

Reptile trafficking activity is particularly pronounced in Australia, where traders both export native species and import foreign ones for breeding or sale.

FIGURE 1

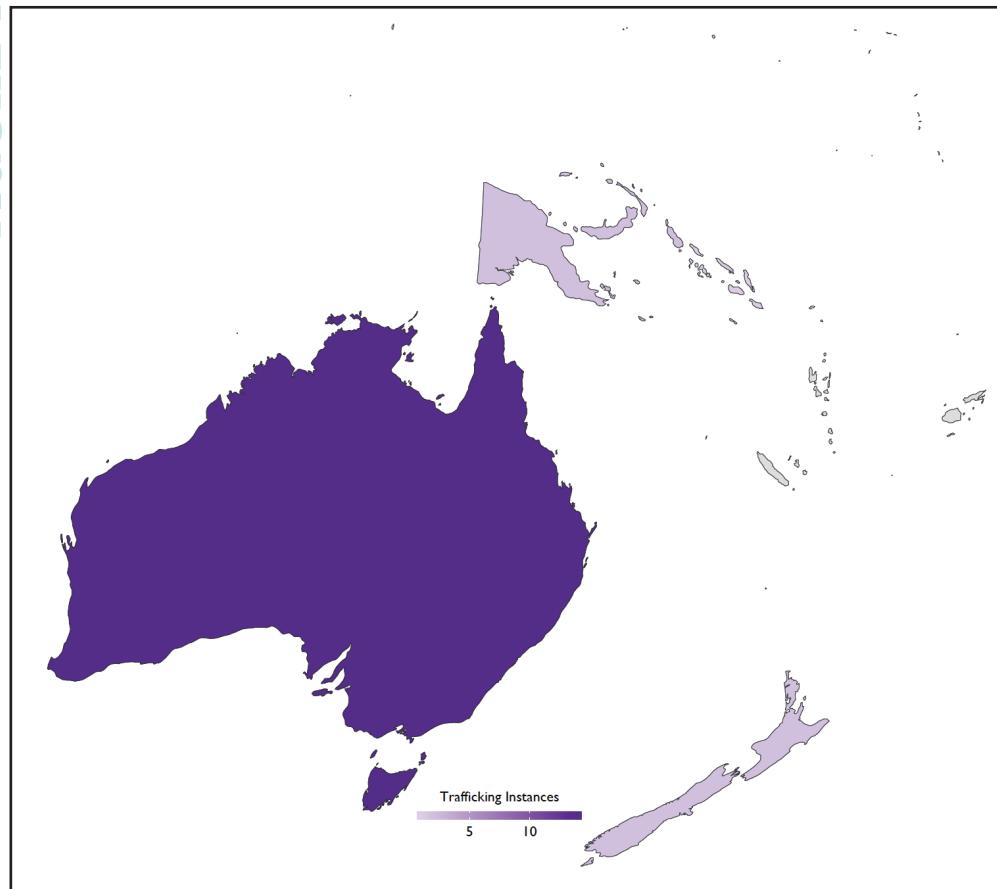


Figure 1. Heat map of wildlife and wildlife product trafficking instances in Oceania's air transport sector (2016 – 2018)

The heat map represents the total number of times that a successful or planned trafficking instance was recorded for each country. The map includes instances where the product did not actually enter a country because it was seized earlier in the route. Note that the heat map reflects only those trafficking instances that were stopped in airports.

The Oceanian heat map indicates that wildlife trafficking by air in the region is largely concentrated in four countries: Australia, New Zealand, Papua New Guinea, and the Solomon Islands. Many Oceanic countries, however, are too small to appear clearly in the heat map, and so any existing trafficking instances in those countries are not visible. Note that other countries in the region, such as Indonesia (Asia) and New Caledonia (France, Europe), do not appear in the Oceanian heat map because they are categorized in different regions for the purposes of this report.

Australia dominates

Between 2016 and 2018, Australia counted seven times more wildlife trafficking instances in its airports than any other Oceanian country. This is not surprising, given that Australia consistently reports seizures publicly and seems to have effective enforcement protocols. Australia also has a remarkable number of endemic species, making the country a target for wildlife traffickers, particularly traffickers involved in the illegal reptile trade.¹

FIGURE 2

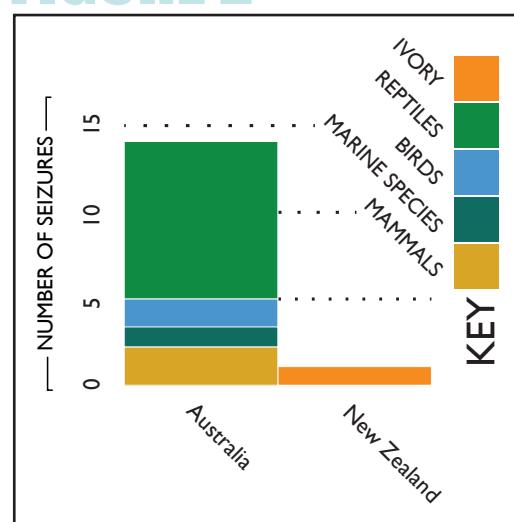


Figure 2. Total seizure count by Oceanian country (2016 – 2018)

FIGURE 3

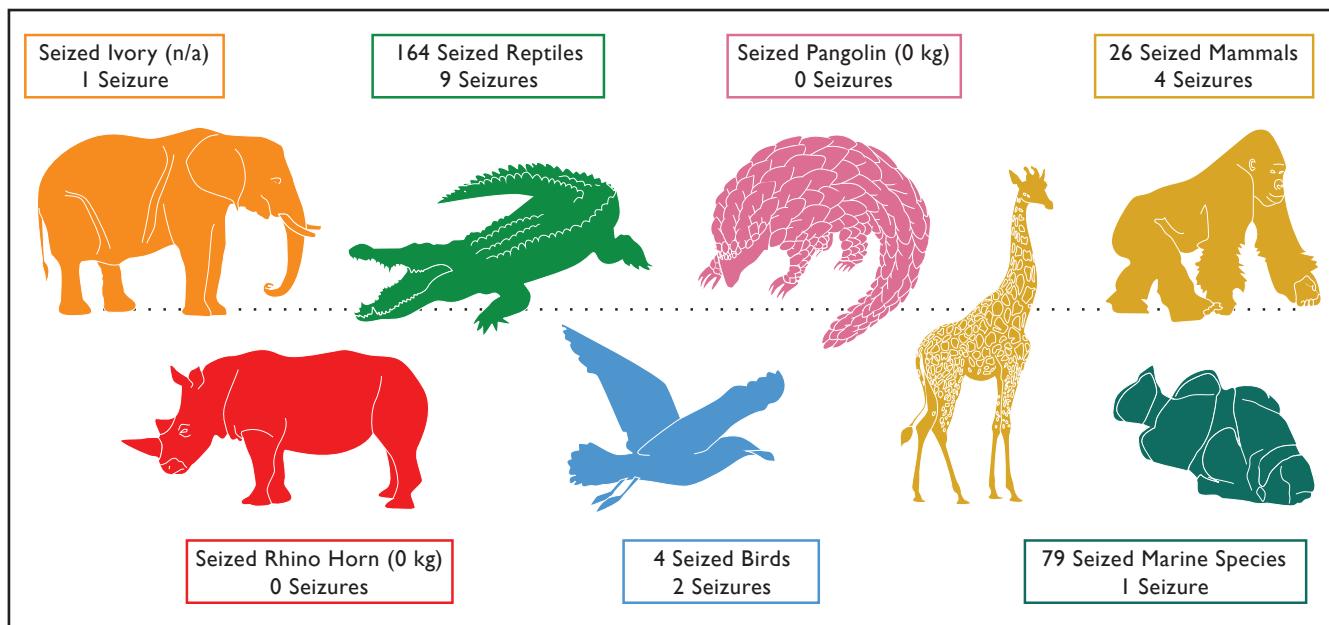


Figure 3. Number of seizures in Oceania of each type of wildlife or wildlife product

According to the C4ADS Air Seizure Database, Oceanian countries counted few known seizures between 2016 and 2018, with Australia making the most by far with only 14 seizures total over the three-year period.

Australian reptile trade

Of the 14 known seizures made by Australian authorities between 2016 and 2018, 64% involved reptiles. Most of these seizures originated in Australia and involved native Australian lizards (most frequently bobtail lizards) destined for Asia, generally Hong Kong.

Two other seizures, however, originated in other world regions and were intercepted as they arrived in Australia. These seizures involved various snake, lizard, and turtle species, including ball pythons and venomous temple pit vipers, as well as Colombian giant tarantulas,

Mexican red-knee tarantulas, Brazilian salmon pink bird-eater tarantulas, and Asian forest scorpions.

Low seizure count

The limited number of wildlife and wildlife product seizures made by Oceanian authorities between 2016 and 2018 is somewhat surprising given the many endemic species present throughout the region. Seizure trends in other world regions instruct that wildlife traffickers tend to target areas with unusual species for sale within the exotic pet trade. As a result, it seems likely that Oceanian mammals, birds, reptiles, and marine species would be targeted by wildlife traffickers. The comparatively high number of reptile seizures in the region between 2016 and 2018 makes sense in this context, but the low numbers of bird, mammal, and marine species seizures in the C4ADS Air Seizure Database do not.

FIGURE 4

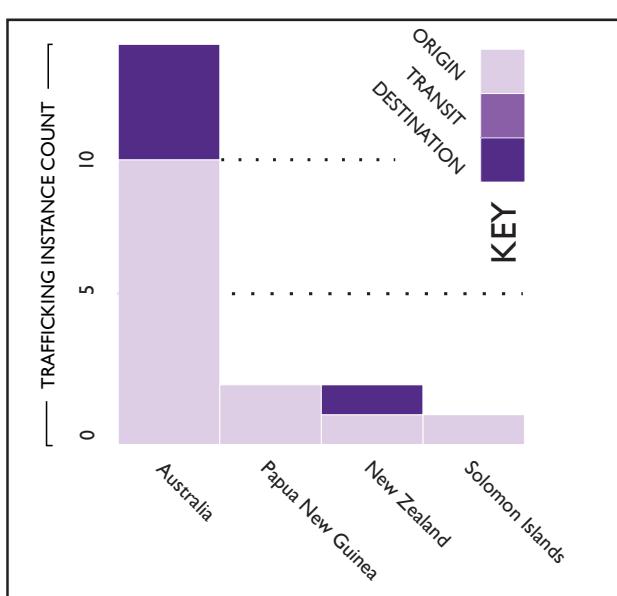


Figure 4. Country-level flight route information for Oceanian countries with one or more trafficking instances (2016 – 2018)

Only trafficking instances for which flight route information exists were included. The data is split by country, rather than airport, to account for transit information reported at the country level.

FIGURE 5

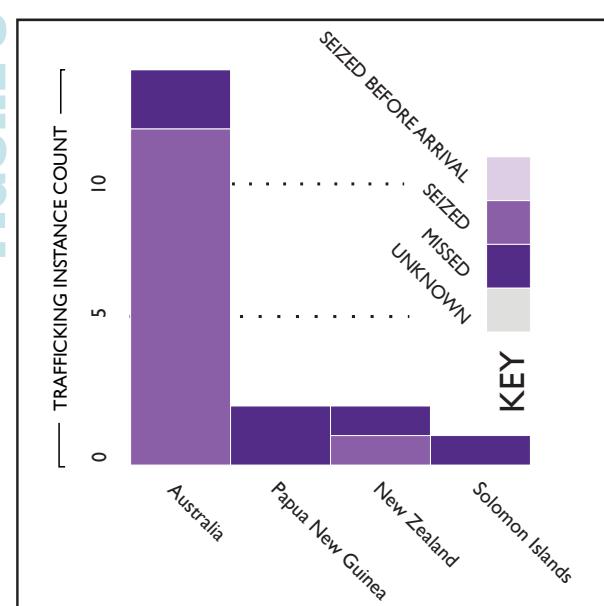


Figure 5. Point of seizure within the supply chain by Oceanian country (2016 – 2018)

Just as Oceania's seizure count was extremely low, Oceania's trafficking instance count fell well below the level of wildlife trafficking activity documented in the C4ADS Air Seizure Database in every other world region. Only four Oceanian countries – Australia, New Zealand, the Solomon Islands, and Papua New Guinea – were linked to any known wildlife trafficking attempts through their airports at all between 2016 and 2018, and only Australia counted more than two known attempts.

Seizures in Australia

With 14 total instances, Australia numbered more trafficking instances in its airports than all other Oceanian countries combined, according to the C4ADS Air Seizure Database. Though the majority of Australia's trafficking instances originated in the country, Australian authorities were able to stop most of the trafficking attempts (88%) passing through their airports.

Oceania as an origin region

Of the 21 known trafficking instances associated with Oceania between 2016 and 2018, 76% originated in the region, with each country visible in Figure 4 counting at least one origin trafficking instance.

SECURITY SCREENING AT ORIGIN VERSUS CUSTOMS SCREENING AT DESTINATION

The region's role as an origin point for trafficked wildlife may partially explain why seizure numbers in Oceania are so low, given that screening for departing flights does not prioritize identifying trafficking attempts. Other contributing factors may include limited public seizure reporting and low enforcement awareness or prioritization of wildlife trafficking.

Few Oceanian seizures elsewhere

Oceania's extremely low seizure count undoubtedly understates the level of wildlife trafficking activity in the region. However, between 2016 and 2018, only four countries outside of Oceania seized wildlife flying out of the region, according to the C4ADS Air Seizure Database: Sri Lanka, China, Indonesia, and France. The fact that so few trafficking instances (only six, or 29% of the total) originated in Oceania and were seized elsewhere suggests that wildlife trafficking activity in the region is either comparatively infrequent, remains largely within Oceania, or generally moves through the maritime industry.

LIZARDS FROM AUSTRALIA

A series of reptile seizures that took place between 2016 and 2018 seemed to suggest that organized reptile trafficking networks might be operating out of Perth, collecting native Australian reptile species and smuggling them to Asian destinations.



Image 1. Reptiles hidden in cloth bags inside computer towers.
Source: Ada Derana

In the more recent, larger seizure in June 2018, Sri Lankan customs officials in Colombo Airport discovered 32 likely endangered geckos and lizards in a DHL shipment of computer towers.ⁱⁱ The animals had been placed in four cloth bags before being hidden within the computers. The shipment had arrived in Colombo on Singapore Airlines flight SQ 468 after leaving from Australia and transiting through Singapore. The shipment's listed destination was a false address.



Image 2. Australian lizards and skinks discovered inside a computer tower. Source: Ada Derana

PAPUA NEW GUINEA & WILDLIFE TRAFFICKING

FIGURE 6

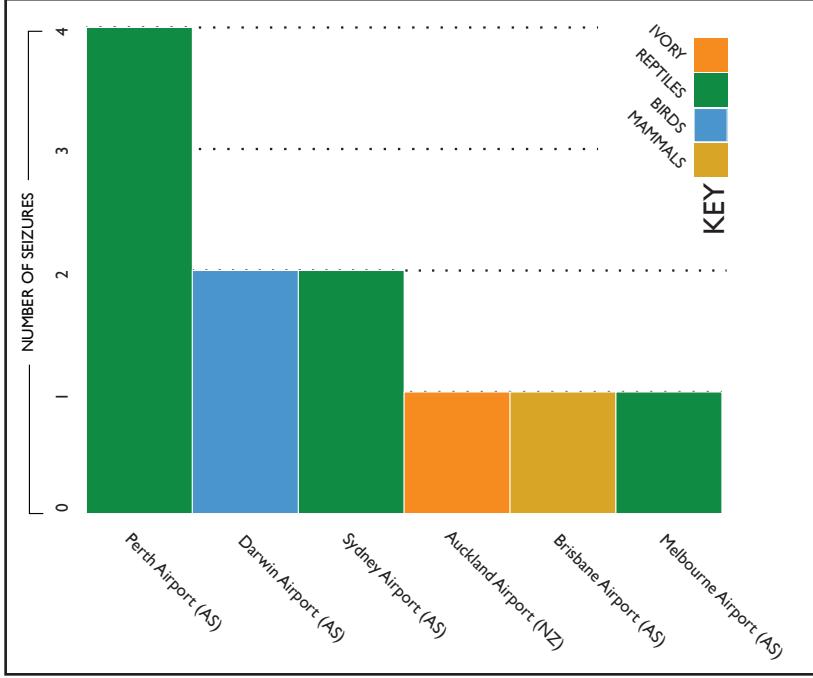


Figure 6. Airport seizure count for Oceanian airports with one or more seizures (2016 – 2018)

The majority of the airports in Figure 6 are Australian – only one, Auckland Airport in New Zealand, is not. The other five Australian airports count ten seizures between them, including seven reptile seizures, two seizures involving both birds and mammals, and one mammal seizure. Note that one Australian seizure was not reported with seizure airport information, and so could not be included in Figure 6.

Occasional seizures of Oceanian wildlife suggest that wildlife trafficking in the region may be more common than it appears. Papua New Guinea in particular is home to a wide variety of species that could be vulnerable to trafficking for the illegal exotic pet trade.

In March 2017, Indonesian officials at Soekarno-Hatta Airport in Jakarta, Indonesia discovered four lizards from Papua New Guinea hidden within plastic cylinders in an air mail parcel.ⁱⁱⁱ The lizards, described as two yellow monitor lizards and two blue monitor lizards, were allegedly destined for Hong Kong, but had flown from Papua New Guinea to Indonesia without the appropriate documentation.



Image 3. Soekarno-Hatta Agricultural Quarantine Office officials show monitor lizards sent from Papua New Guinea without the appropriate paperwork to the press. Source: Antara News

Significance of Perth Airport

According to the C4ADS Air Seizure Database, Perth Airport counted more seizures than any other airport in Oceania with four reptile seizures. The seizures displayed certain similarities; for instance, each involved bobtail lizards intended to fly from Perth to either Hong Kong or Japan. One instance was supposed to fly from Perth to Hong Kong before continuing on to Japan. Each trafficking attempt was hidden in either mail or checked luggage, and each involved either a Chinese or a Japanese trafficker. These similarities suggest that organized trafficking networks operate out of Perth Airport, and may specialize in poaching bobtail lizards for sale as exotic pets in Asia. See **Reptile Trafficking in Perth Airport** for more information.

Appearance of Darwin Airport

Darwin Airport counts two mammal and bird seizures in Figure 6, both of which were linked to the same Australian wildlife product dealer (see **Wildlife Product Trafficking in Australia**).

Appearance of Auckland Airport

Although wildlife seizures are generally an outward sign of underlying illegal activity, some do capture tourists and other travelers who are simply unaware of existing regulations. For instance, in July 2018, New Zealand officials in Auckland Airport intercepted an antique piano after it arrived at the airport from the United Kingdom because its keys were made of ivory.^{iv} Though the piano was old enough to be exempt from the CITES ivory ban, the owners of the piano were unaware of CITES regulations for ivory exports and so did not apply for the exemption, meaning the piano had been exported illegally.

REPTILE TRAFFICKING IN PERTH AIRPORT

A series of reptile seizures that took place between 2016 and 2018 seemed to suggest that organized reptile trafficking networks might be operating out of Perth, collecting native Australian reptile species and smuggling them to Asian destinations.

In the first seizure on December 13, 2016, Australia Post workers at Perth Airport X-rayed a mail package destined for Hong Kong and discovered 10 bobtail lizards and one blue-tongued lizard wrapped in socks inside.^v



Image 4. Lizards found in a mail package after the package was x-rayed. Source: Australian Border Force



Image 5. A number of the lizards discovered on December 13th hidden in socks. Source: Australian Border Force

A subsequent investigation into the shipment by Australia Border Force (ABF) and Parks and Wildlife officials identified a Chinese male as a “person of interest.” Officials found him as he was boarding a flight to Hong Kong, and noted that his baggage contained the same type of socks that the lizards had been found in earlier that day. Further investigation led officials to a second mail shipment of lizards, this time containing 11 bobtail lizards and one blue-tongued lizard, on their way to Hong Kong on December 14. The Chinese trafficker associated with both shipments was later charged with attempting to export a regulated native specimen.

Roughly six months later, in May of 2017, ABF officials X-rayed a checked bag destined for Japan and found 13 bobtail lizards in cotton bags hidden inside.^{vi} The suitcase’s owner, a Japanese national, was arrested for attempting to export a regulated native specimen.

Finally, on November 8, 2018, ABF officials received information from the Parks and Wildlife Service that a Japanese man was attempting to smuggle six bobtail lizards out of Australia.^{vii} Officials found the suspect and X-rayed his suitcase, revealing lizards wrapped in paper towels inside a cloth bag. Further investigation discovered that “three of the lizards were taken from Rottnest Island, one from the Midwest region and two from the Perth metropolitan area, and that some had been kept in hessian bags for up to eight days with no food and little water.”^{viii}

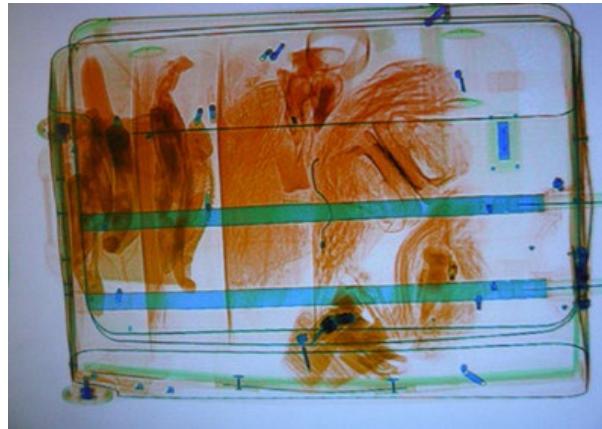


Image 6. 13 bobtail lizards, seven adults and six juveniles, inside a checked bag headed to Japan. Source: Australian Border Force



Image 7. Six bobtail lizards hidden in a bag likely on the way to Japan via Hong Kong. Source: Australian Border Force



Image 8. Three of the bobtail lizards seized on November 8, 2018. Source: Australian Border Force

The similarities between both sets of seizures suggest that at the very least, two reptile trafficking networks have operated out of Perth in the past. The first network seemed to rely on mail shipments to move both bobtail lizards and blue-tongued lizards to China, while the second preferred to hide bobtail lizards in checked bags likely destined for Japan.

At the time of the November 2018 seizure, an Australian official with the Parks and Wildlife Service noted that Western Australian reptiles, including bobtail and blue-tongued lizards, are “highly sought after on the black market because they [are] easy to care for, attractive, and exotic.”^{ix}

FIGURE 7

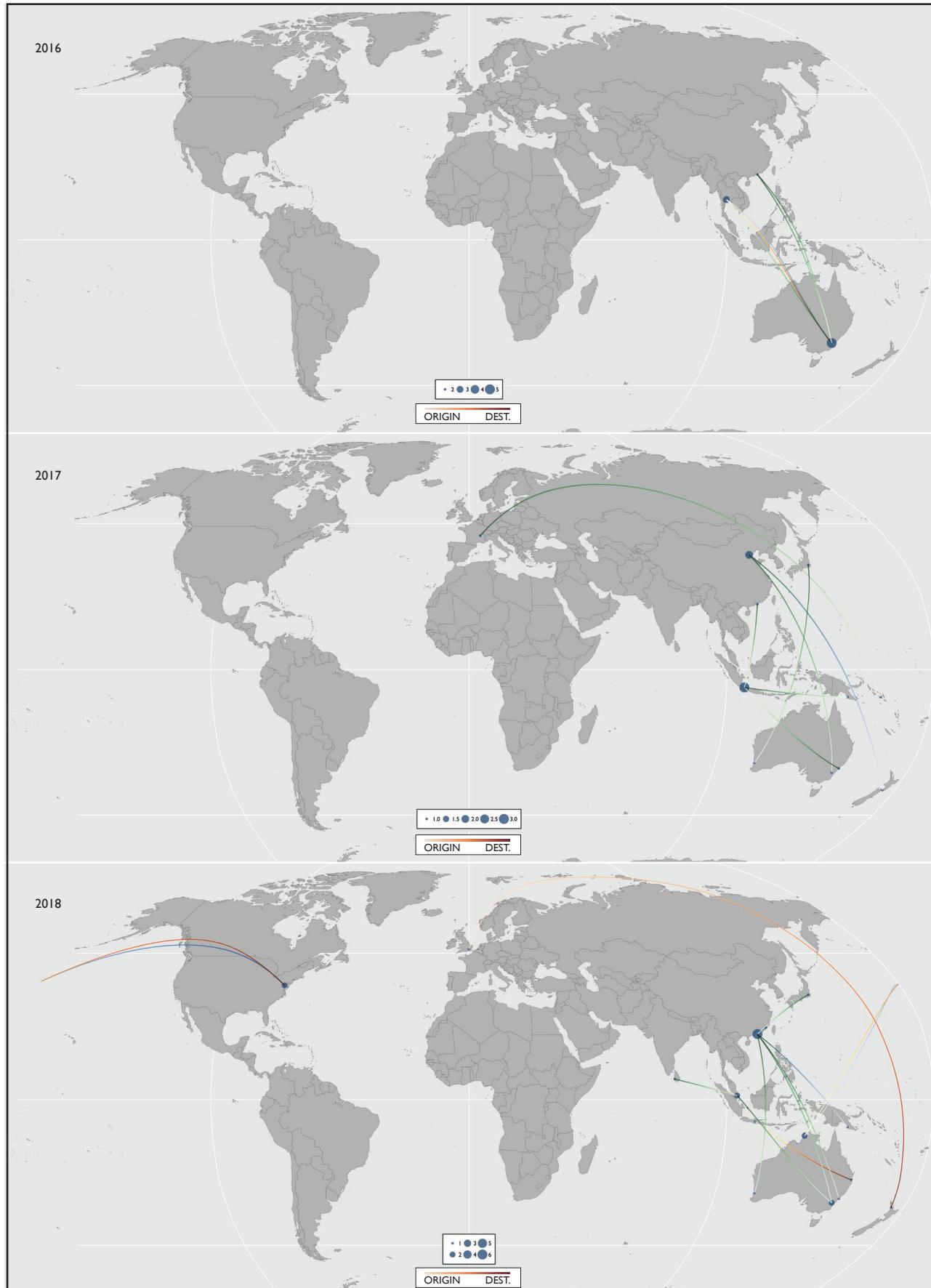


Figure 7. Oceanian air trafficking routes recorded in the C4ADS Air Seizure Database (2016 – 2018)

Circle size indicates the number of flights carrying illicit wildlife that departed from or arrived in a particular city. Capital cities are used when specific airports are unavailable

The Oceanian routes maps emphasize how little seizure data is available for the region, despite the fact that Oceanian countries' biodiversity likely exposes the area to exploitation by wildlife trafficking networks.

Flight routes destined for Oceania

Most of the flight routes visible in the Oceanian heat maps originated in the region, particularly in Australia. But several visible flight routes were destined for Oceania instead, including a mammal instance destined for Australia in 2018 (see **Australia and Euthanasia**), and a number of reptile instances destined for Australia in 2017 (see **Wildlife Trafficking & Rugby**).

IMAGE 9



Image 9. A giant clam shell flown into China via Hong Kong by a Chinese passenger returning from Papua New Guinea. Source: Xiamen Customs

Marine species trafficking

Three marine species trafficking instances left Oceania between 2016 and 2018. Two were eventually seized in China and reported by Chinese customs authorities. The first involved a mail shipment of fish, dried sea cucumber, deer antler velvet (used in traditional medicine), and deer tongue arriving in Tianjin Binhai Airport from New Zealand in June 2017.^x The second took place a year later in August 2018, and involved an “unprocessed” clam shell discovered in a Chinese male passenger’s checked bag.^{xi} He had flown in to Xiamen Gaoqi Airport from Port Moresby, Papua New Guinea via Hong Kong on Cathay Dragon flight KA 606.

As a region made up of island nations, it is surprising that Oceania does not count more seizures of marine species. These two seizures, however, indicate that marine species trafficking does occur in the region, although it may not be caught or reported.

Destined for China

Most of the trafficking instances visible in the Oceanian routes maps were destined for Asian airports, accounting for 73% of the known instances originating in Oceania, according to the C4ADS Air Seizure Database. More specifically, of the 14 trafficking instances that originated in Oceania between 2016 and 2018, eight (57%) were attempting to fly to Chinese airports. This Oceania – China supply chain was almost entirely driven by Chinese demand

for certain reptile species for the pet trade (see **Reptile Trafficking in Perth Airport**), although traditional medicine also appeared to play a role in at least one marine species trafficking instance. This suggests that there may be fairly significant demand for Oceanian wildlife and wildlife products in China.

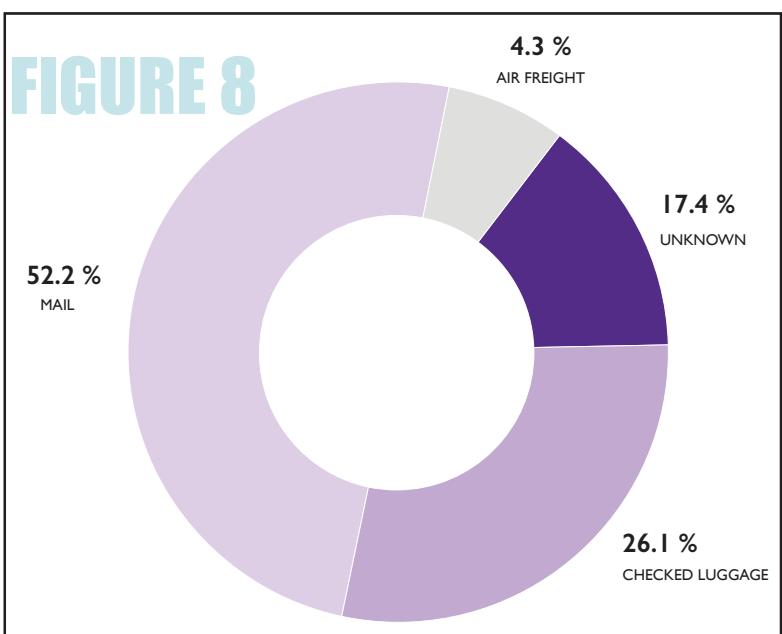


Figure 8. Transport methods for Oceanian trafficking instances in the air transport sector (2016 – 2018)

The Oceanian transport method graph is strikingly different than the transport method graph for every other world region. Whereas wildlife seizures discovered in mail shipments are generally assumed to be under-represented in the C4ADS Air Seizure Database due to a combination of less stringent screening requirements for mail and less frequent public seizure reporting, Oceanian trafficking instances were discovered hidden in mail 52% of the time. Oceanian trafficking instances were only discovered in checked luggage, the most common transport method in every other world region, 26% of the time.

Prevalence of mail

All of the mail trafficking instances visible in Figure 8 were stopped in Australia, China, or Indonesia. Australian authorities seem particularly adept at identifying contraband, wildlife or otherwise, in mail shipments, so much so that the majority of the seizures Australian authorities made between 2016 and 2018 were hidden in mail. The ABF is also careful to publish press releases for the wildlife seizures they make, although they sometimes report seizures in bulk, which prevents analysis of individual seizure trends (see **Aggregated Seizures in Australia**). Similarly, China is particularly good at identifying smallscale wildlife seizures and reporting them with a fair amount of detail.

Appearance of checked luggage and air freight

According to the C4ADS Air Seizure Database, trafficking attempts in Oceania were far less likely to be found in checked luggage or air freight than in any other world region. Trafficking via air freight was particularly unlikely, with only one known Oceanian trafficking instance discovered in air freight.

Known Oceanian trafficking attempts moved by checked luggage and air freight between 2016 and 2018 were evenly split between live animal instances involving bobtail lizards, monitor lizards, or squirrels and wildlife product instances involving reptile products or giant clams.

AUSTRALIA AND EUTHANASIA

As residents on a large island nation, many Australian species have spent millennia evolving into animals different from any species living in Africa, Asia, Europe, the Middle East, or the Americas. As a result, Australian species are unique, drawing the attention of tourists and traffickers alike.

But the prolonged isolation of Australia has led to at least one clear downside: Australian species are not equipped to handle diseases that other animals evolved to deal with thousands of years ago, and Australian ecosystems are not prepared to combat the influx of certain foreign species, such as cane toads and red foxes.

As a result of the threats posed to Australian wildlife and agriculture by foreign animals, Australian officials generally must euthanize any foreign species they catch being illegally imported into the country.

For example, on March 14, 2017, ABF officials in Melbourne X-rayed a mail shipment that had just arrived from Northern Europe and discovered a variety of live reptiles and tarantulas inside (some of the spiders were already dead).^{xii xiii} Officials opened the shipment and found:

- Three ball pythons,
- Two hognose snakes,
- Six venomous Wagler's temple vipers,
- Two Colombian giant tarantulas,
- Five Mexican red-knee tarantulas,
- Two Brazilian salmon pink tarantulas (the third largest tarantula species in the world), and
- Four Asian forest scorpions.

The press release published by the ABF about the seizure noted, "These [species] pose a high biosecurity risk to Australia because they can carry pests and diseases that aren't present here."^{xiv} As a result, all of the snakes and the surviving spiders had to be euthanized.

A few months later, in June 2017, ABF at Sydney Airport X-rayed a mail shipment declared as "toys" and discovered 50 turtles and lizards inside, hidden amongst building blocks. The shipment had come from Indonesia. Citing the biosecurity risk posed by allowing the animals to live, officials had to euthanize all 50 animals.



Image 10. Snakes euthanized after arrival in Melbourne. Source: Australian Border Force



Image 11. An x-ray of a mail shipment of turtles and lizards seized in Sydney.
Source: Australian Border Force



Image 12. Turtles and lizards declared as "toys" and shipped from Indonesia.
Source: Australian Border Force

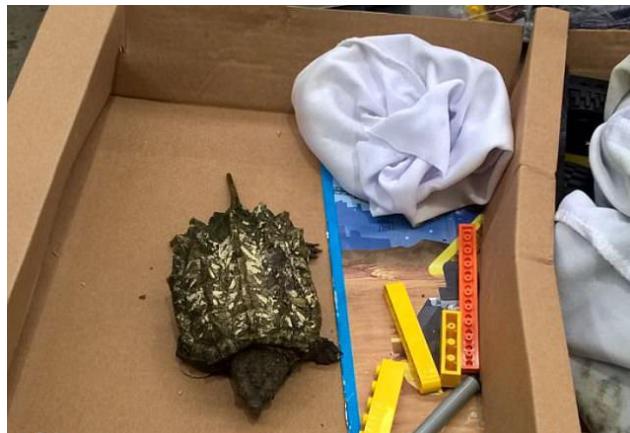


Image 13. One of the turtles seized and euthanized in Sydney in June 2017.
Source: Australian Border Force

Finally, in December 2018, ABF officials received information from Border Watch about a traveler returning home to Brisbane Airport from Bali, Indonesia.^{xv} After receiving the tip, ABF officers approached the passenger and identified two live squirrels in his luggage. Again referencing the biosecurity risk posed by the animals, as well as squirrels' ability to carry rabies, officials euthanized both animals.

Unlike other countries that are able to re-home or release seized wildlife, Australian officials cannot afford to risk introducing new species and any diseases they may carry into their country. As a result, any traffickers attempting to smuggle wildlife into Australia are both jeopardizing the health of native Australian species and likely wasting the lives of animals they are probably trying to sell as pets.

AGGREGATED SEIZURES IN AUSTRALIA

WILDLIFE TRAFFICKING & RUGBY

Although there were comparatively few reptile seizures in Oceanian airports between 2016 and 2018 according to the C4ADS Air Seizure Database, several seizures suggested that there is a prominent illegal reptile trade in Australia, with a number of reptile traders dedicated to exporting native Australian species and importing a wide variety of non-native species from contacts in other countries.

For example, between July and October 2016, ABF officials intercepted 22 separate packages containing wildlife in three seizure events.^{xvi} In the last seizure on October 19, 2018, officers from the Department of Agriculture discovered the following animals in 16 packages from Bangkok:

- 23 Chinese softshell turtles,
- 15 alligator snapping turtles,
- 15 veiled chameleons,
- 11 neotropical stingrays,
- Ten live snakehead fish (58 dead snakehead fish), and
- Two live sugar gliders (18 dead sugar gliders).

Officials also discovered at least one attempted export of shingleback lizards to Sweden in around the same timeframe.

An in-depth investigation conducted after the seizures led back to Martin Kennedy, a former rugby player who was suspended from Australia's National Rugby League after he ordered "a number of prohibited substances during the 2012 off-season."^{xvii} Officials later found two pythons in his home and AU\$43,550 in his freezer.^{xviii}

Although Australian customs and enforcement agencies generally publish detailed seizure press releases that are well-suited to inclusion in seizure analyses, they also occasionally publish aggregated seizure data that cannot be used to determine trafficking trends.

For example, in October of 2018, ABF issued a press release stating that, "In the last three months alone, [ABF] officers have stopped a total of 20 separate consignments containing more than 110 reptiles from being illegally exported overseas."^{xix} The press release then explains the number of seizures made each month, detailing some of the concealment methods used by traffickers to hide the animals, and mentions general intended routes of the shipments, explaining that each was found in the mail.



Image 15.
Two of the
lizards
discovered in
the fall of
2018 in a mail
shipment.
Source:
Australian
Border Force



Image 14. Ex-rugby player Martin Kennedy. Source: Australian Associated Press

In March 2018, Kennedy pled guilty to six charges relating to the import and export of native and regulated animals, as well a charge for possessing non-native endangered animals.^{xx} During his sentencing trial, Kennedy claimed that he had borrowed AU \$25,000 from his friend, Neil Simpson, to pay legal bills relating to his anti-doping hearing. Kennedy explained that to repay Simpson, who is fairly well-known in his own right for "a lengthy criminal history relating to animal smuggling and bank fraud," he decided to join Simpson's animal trafficking operation.^{xx} Simpson, however, disagreed, saying that he actually gave Kennedy AU\$27,000 and AU\$85,000 to pay for two albino snakes Kennedy was planning to breed. According to Simpson, "[Kennedy] had a very good reputation...for breeding reptiles."^{xxi}

Martin Kennedy was sentenced in June 2019 to "three years imprisonment, to be served in the community by way of an intensive correction order."^{xxii} He is required to complete 700 hours of community service.



Image 16. An X-ray of lizards hidden in a mail parcel. Source: Australian Border Force

Image 16. An X-ray of lizards hidden in a mail parcel. Source: Australian Border Force

While certainly an indication of effective enforcement and helpful to indicate the true scale of trafficking activity in Australia, compiled seizure information is difficult to incorporate in seizure databases such as the C4ADS Air Seizure Database. Aggregated information also usually cannot be analyzed to understand how trafficking trends are changing (e.g. What other countries and species are involved? What transport methods do they rely on consistently? Are there any clear patterns in the trafficking method used?) (see **Appendix IV: Seizure Reporting Template**). As a result, the majority of the seizures mentioned here could not be incorporated in the C4ADS Air Seizure Database. Still, Australian agencies are far better at public seizure reporting than most of their counterparts in other countries.

WILDLIFE PRODUCT TRAFFICKING IN AUSTRALIA

Two mammal and bird product seizures in Australia's Darwin Airport in 2018 revealed what seemed to be an international operation trafficking in exotic wildlife products.

On July 31, 2018, Australian Parks and Wildlife officers discovered a red-tailed black cockatoo skull and a king colobus monkey skull during routine screening of a mail package destined for the United States.^{xxiv} A subsequent seizure uncovered a straw-necked ibis skull and an olive-backed baboon skull in another mail shipment.

Following the two seizures, officials from the Australian Border Force (ABF), Parks and Wildlife, and police executed a search warrant at a property in Driver and discovered a vast array of reptile, bird, and mammal derivatives from Australian and other non-native species. Most of the products consisted of "skulls, skeletons, and other parts allegedly belonging to ... animals including ocelots, kangaroos, chipmunks, crocodiles, wombats, hornbills, bearded dragons, ... dogs, fish, wedge-tail eagles and a number of domestic species including goats, ducks and chickens."^{xxv} Photos from the search appeared to show skulls and bones from various species in various states of decomposition arranged on shelves, plates, and sometimes piled on the ground. A 34-year-old Australian man was arrested in association with the discovery.

"...although wildlife seizure numbers in Oceania appear to be low, the unique, exotic species living."



Image 17. Skulls and bones from various mammal, bird, reptile, and fish species arranged on a shelf at the Driver property. Source: Australian Border Force

The scale of the operation identified as a result of these two mail seizures would likely require an international network of traffickers working to poach native and non-native species in various countries and then prepare their skeletons and body parts for display. This supports the theory that, although wildlife seizure numbers in Oceania appear to be low, the unique, exotic species living there must draw in traffickers involved in both the live animal and wildlife product trades.

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CONCLUSION & RECOMMENDATIONS

In *Runway to Extinction*, C4ADS finds the illegal wildlife trade to be truly global in scope, encompassing more and more locations as each year goes by. Traffickers operating in each of the world regions covered by this report – Africa, the Americas, Asia, Europe, the Middle East, and Oceania – relied repeatedly on the same or similar trafficking methods and flight routes, often exploiting the same vulnerabilities within the air transport sector as traffickers of other illicit goods. The greatest variation in wildlife trafficking occurred not necessarily between regions, but between the species or wildlife product trafficked; the specific methods used and routes taken by wildlife traffickers were heavily dependent on wildlife type (e.g. Guyanese finches are always smuggled in hair curlers from Guyana to New York; pig-nosed turtles are generally smuggled in huge quantities, declared as a marine species, and flown from a regional Indonesian airport to Jakarta before flying to China).

Although wildlife trafficking bleeds into countries on every continent other than Antarctica, China's role in the illegal wildlife trade (likely driven by high demand for wildlife, but also by fairly effective enforcement, good reporting standards, and sheer population size) completely eclipsed the involvement of any other country, and seemed to be increasing. Relatedly, wildlife product processing seems to be moving closer and closer to source regions to reduce the chances of discovery in transit, suggesting that seizures of smaller quantities of processed ivory, rhino horn, and marine species will increase in the future. Finally, wildlife trafficking can be roughly divided into two groups: wildlife product trafficking (ivory, rhino horn, pangolins and pangolin products), which generally flows from Africa to Asia in a broad supply chain that narrows substantially as it approaches its end; and live animal trafficking (reptiles, birds, marine species, and mammals), which is widely dispersed throughout the world, without a clearly definable supply chain.

As in *Flying Under the Radar* and *In Plane Sight*, *Runway to Extinction* provides broadly applicable recommendations¹ that, if implemented correctly, could help to reduce wildlife trafficking throughout the air transport system as a whole. Most of last year's recommendations are still applicable this year, and primarily involve awareness, training, enforcement procedures, seizure reporting, and prevention efforts. The recommendations are grouped below by topic, and are meant to be applicable to enforcement, industry, intergovernmental organizations, and nongovernmental organizations. For more specific recommendations regarding a certain species or region, please contact C4ADS or the broader ROUTES Partnership.

¹ More specific recommendations would require knowledge of each country's current seizure reporting protocols and awareness raising activities, and so were outside the scope of this analysis.

For agencies and organizations interested in taking a more proactive approach to combatting wildlife trafficking, we have included examples, possible paths forward, and organizations to contact wherever possible in Appendix III. The implementation of many of the recommendations can also be supported by the resources developed under the ROUTES Partnership and work being undertaken by other groups on wildlife trafficking (e.g. United for Wildlife and the US Wildlife Trafficking Alliance).

Each recommendation is marked with the following symbols to illustrate its intended audience:



Regardless of each recommendation's intended audience, note that communication and collaboration are needed, at a minimum, between enforcement and industry to ensure that wildlife trafficking through the air transport sector is addressed comprehensively and strategically. In addition, many of the trafficking methods identified in both *Flying Under the Radar* and *In Plane Sight* are utilized by traffickers of all types. As a result, implementation of the following recommendations will likely improve enforcement success not just for the illegal wildlife trade, but for other crime types as well.

C4ADS recommends the following steps be taken to improve enforcement success rates and reduce wildlife trafficking by air.

RECOMMENDATIONS

AWARENESS

1. Increase awareness among air passengers, aviation staff, freight forwarders, shippers, and enforcement officials.
2. Adopt or create a pamphlet or tool tailored to each country to help customs and enforcement officials, as well as relevant industry personnel, identify restricted species and wildlife products commonly trafficked through their territory.
3. Ensure public reporting mechanisms are in place and well-known so passengers can report suspected wildlife trafficking instances.

TRAINING

4. Provide training on red flag indicators associated with wildlife traffickers and shipments. Ensure that follow-up trainings are provided as necessary to support uptake.
5. Incorporate training for airline staff on how to safely handle trafficked live or dead animals after discovery into existing training programs. Create and provide “forensic protection protocols” training to preserve evidence for trial.

ENFORCEMENT

6. Develop clear escalation procedures upon discovery of potential illegal activity.
7. Engage with the private sector to ensure that aviation personnel are aware of the types of information needed to follow up on reports of wildlife trafficking. Provide feedback to industry and the public on the outcomes of submitted tips.
8. Develop post-seizure procedures to safely and securely store wildlife products or ensure the proper care of trafficked live animals. Develop procedures to track seized live animals and wildlife products.
9. Dedicate additional resources to combatting the illegal wildlife trade in common hub airports exploited by wildlife traffickers.
10. Develop or enhance customs screening procedures for transit flights.
11. Customs and enforcement should be aware of flight routes opening through high-risk areas.
12. Develop and maintain a comprehensive internal database of entities previously involved in wildlife seizures.
13. Develop a system to test counter-wildlife trafficking protocols.
14. Improve wildlife customs screening requirements for postal mail shipments. Ensure mail seizures are reported to the same degree as passenger, checked luggage, or air freight seizures.
15. Increase cooperation with other customs and enforcement agencies along high-risk supply chains. Inform foreign agencies of seizures on flights that have left or are destined for their countries.

RECOMMENDATIONS

SEIZURE REPORTING

16. Store collected seizure information in one centralized database.



17. Develop a procedure to publicly report seizure information. Update seizure press releases with prosecution results.



POLICY

18. National laws should, at a minimum, enforce CITES regulations and regulate the domestic trade in non-native species. Penalties for wildlife trafficking should be raised until they are sufficiently deterrent.



DETECTION

19. Pursue shift towards electronic paperwork for air freight and updated technology for customs screening. Expand advanced cargo and passenger information systems to include red flags for the illegal wildlife trade. Incorporate CITES e-permits in e-documentation systems.



APPENDIX I:

Security & Health Risks of Wildlife Trafficking

The following is an excerpt from *In Plain Sight (2018)* describing the security and health risks associated with wildlife trafficking.

Wildlife trafficking activity, once believed to only negatively impact the environment, has also increasingly been linked to security and health concerns.

As the illegal wildlife trade has grown in prominence and in value, the high profits and low risks associated with engaging in wildlife crime have attracted the attention of other criminal networks. Totoaba trafficking in Mexico is a good example of this phenomenon; when the high value of totoaba, a protected fish species in the Gulf of California, became common knowledge, organized criminal groups moved into the trade, taking advantage of the initially indifferent attitude of Mexican authorities. By 2014, organized criminal involvement had grown to such an extent that two different traffickers—one an alleged member of the Sinaloa cartel, the other a member of the Arellano Felix cartel—were murdered over the right to control the totoaba trade in a coastal town. To this day, totoaba traffickers seem to rely primarily on flights between Mexico, the United States, and China to move totoaba to destination markets.ⁱ

Furthermore, wildlife traffickers rely on the same weaknesses and loopholes within airports that are exploited by criminals of all types. Wildlife seizures can therefore be seen as a glimpse into trafficking activity as a whole—a “canary in the coal mine” for vulnerable airports.

In addition to the negative environmental and security implications of wildlife trafficking, the illegal wildlife trade can also put the health of humans and other animals at risk. In regards to the air transport

sector specifically, demand for highly venomous animals can put officials, aviation employees, and passengers at risk: in at least one reptile trafficking incident in 2012, three venomous snakes were euthanized on discovery, since airport authorities did not have the requisite anti-venom on hand.ⁱⁱ

Short travel time, diverse flight routes, and the increasing prevalence of air travel also mean that transferrable diseases carried by wildlife can move quickly between countries, potentially exposing thousands of people around the world to infection with deadly diseases in a short timeframe. Birds alone can carry over 60 diseases that are transferrable to humans, including Salmonellosis, E. coli, avian tuberculosis, and multiple bird flu virus strains.^{iii iv} One strain, H5N1, has a mortality rate of 60% according to the World Health Organization (WHO).^v Other species can also transmit dangerous diseases to humans. The 2014 Ebola epidemic, for example, is believed to have begun after a baby boy in Guinea came in contact with infected wild animals, most likely bats in his backyard.^{vi} Diseases carried by primates, rats, and other species are also highly transmissible to humans; primates can transmit diseases like HIV, Hepatitis B, and tuberculosis, while rats and fleas are famously the origin of the bubonic plague.^{vii}

Preparing ahead of time to anticipate and prevent wildlife trafficking activity in the air transport sector therefore becomes all the more important, not only to halt the decimation of the world’s wildlife, but also to impede the operations of organized criminal networks, and preclude the spread of dangerous diseases across international borders.

APPENDIX II:

Seizure Data & Runway to Extinction

The following is an excerpt from *In Plane Sight (2018)*, updated to include information relevant to the data analyzed in Runway to Extinction.

Mapping, measuring, and understanding trafficking activity is an inherently challenging task – how can purposefully clandestine behavior be reliably unearthed and traced? Seizures are the publicly visible signs of trafficking activity that lies underneath an opaque shroud. Compiling seizure data over time can help to fill in the missing pieces and develop an understanding of how trafficking networks operate, focusing in particular on the routes they use and the trafficking methods they rely on.

Information pulled from seizure data does, however, only reflect the least successful trafficking attempts. Wildlife trafficking analyses are further plagued by a system-wide lack of consistent, accurate, adequately detailed, and publicly available seizure information. Although several wildlife seizure and wildlife trade databases exist, most databases do not include the information required for inclusion in the C4ADS Air Seizure Database, and so were excluded. For example, the following databases, while useful in certain circumstances, could not be used for this report:

- *CITES Trade Database*: The publicly available CITES Trade Database tracks the legal trade in endangered species as reported by CITES signatory countries. Some countries choose to also report instances of illegal trade, but often without sufficient detail to cross-reference them with seizures already in the C4ADS Database to avoid duplication. Furthermore, not all CITES signatories report to the Management Authority as requested, and even for those countries that do report, CITES notes that seizure information is “often absent or provided in insufficient detail.”^{viii}
- *The Elephant Trade Information System (ETIS) Database*: The ETIS Database records all seizures of elephant specimens reported to CITES beginning in 1989 and is managed by TRAFFIC on behalf of CITES.^{ix} Although the Database is likely the most comprehensive database on ivory seizures in the world, it is not publicly available.
- *The European Union (EU) Trade in Wildlife Information Exchange (TWIX)*: The EU-TWIX database holds all seizures reported by the 28 EU Member States.^x The database is only available to enforcement officials working on wildlife crime within the EU. C4ADS submitted a request to access EU TWIX data in 2019, but did not receive a reply.
- *The Africa Trade in Wildlife Information Exchange (TWIX)*: Similar to the EU-TWIX database, the AFRICA-TWIX database contains seizures reported by Central African member countries.^{xi} The database is only available to enforcement officials working on wildlife crime in Central Africa.

Although seizure data are instrumental in understanding the operations of wildlife traffickers, the data is vulnerable to a number of common biases. For example, wildlife seizures are more likely to occur in jurisdictions where enforcement officials are aware of and trained to look for wildlife trafficking, which may lead to the perception that trafficking is worse in areas with better enforcement. In prominent transit jurisdictions, where enforcement has limited ability to screen passengers and shipments between flights, officials are less likely to make seizures, creating the appearance of ineffective enforcement in those areas. An in-depth discussion of the various issues surrounding the use of seizure data can be found in Appendix I: Seizure Data Biases & Vulnerabilities of Flying Under the Radar.

THE DATA

The C4ADS Air Seizure Database is compiled through extensive, multilingual open source^l research conducted by C4ADS analysts on a monthly basis, and supplemented wherever possible with additional information obtained through C4ADS’ partner network.

In the first year of the ROUTES Partnership, C4ADS collected open source data on ivory, rhino horn, reptile, and bird seizures—which together represent 66% of trafficked wildlife products^{xii}—to form a baseline for analysis conducted over the next four years. In the second year of the Partnership, C4ADS continued to collect seizure data for the original four categories on a monthly basis, while simultaneously building datasets for three additional categories: pangolins, marine species, and mammals. No new categories were added in the third year. Together, the seven categories contained within the C4ADS Air Seizure Database account for 81% of known trafficked wildlife and wildlife products.^{xiii}

The publicly available resources C4ADS used for this report included, but were not limited to:

- Customs press releases
- Local news reports
- CITES annual reports
- Robin des Bois’s On the Trail Bulletins
- TRAFFIC Bulletins
- Academic and statistical reports (e.g. CITES ETIS reports, etc.)
- Social media

C4ADS also began a data sharing partnership with TRAFFIC in early 2018 to periodically exchange seizure information found in the open source. C4ADS relied on TRAFFIC’s seizure database to ensure that as many published seizure reports as possible had been captured in the C4ADS Air Seizure Database.

^l The “open source” here refers to all publicly available sources of information, e.g. local news reports, CITES reports, customs press releases, etc.

Note that open source seizure numbers are impacted by differences in seizure reporting, both due to differences in government seizure reporting protocols and to varying media and public interest. For instance, seizures of animals and animal products from charismatic species (like elephants) and species facing well-documented and intriguing challenges (like the totoaba) are more likely to receive media attention, and are therefore more likely to be captured in the C4ADS Air Seizure Database. C4ADS analysts worked to minimize inconsistencies by researching every seizure to obtain as much information as possible, thereby filling in most gaps left by inadequate seizure reports published by a government agency or news outlet.

Of course, some seizures still lack important information. In fact, some seizures lacked so much information that they could not be included in the C4ADS Air Seizure Database. At a minimum, C4ADS analysts needed the date of the seizure (at least the year), the location of the seizure (at least the country), and some indication as to the contents of the seizure to include it.

In total, C4ADS gathered 668 seizures of wildlife and wildlife products in the air transport sector between 2016 and 2018 (a total of 1,586 between 2009 and 2018). The number of seizures contained within each category in the C4ADS Air Seizure Database (Figure 1) varied for a number of reasons. For example, seizure numbers are affected by differences in the species being trafficked, including the rarity of the species, the remoteness of the species' habitat, the difficulty of trafficking the species or product, and the likelihood that seizures of that species will be reported.

C4ADS compiled information on each seizure's location, date, weight or quantity, species, trafficking route information (origin location, transit location, and destination location, city-specific wherever possible), transport method, method of detection, obfuscation method, airline, and flight number, as well as any other relevant information. "Transport method" was defined as passenger clothing/items, checked luggage, air freight, mail, or private plane, and "obfuscation method" was defined as the way in which contraband had been concealed (e.g. inside computer towers). While some categories seemed to be fairly consistently reported, like seizure country, seizure airport, and origin location, other categories with important implications for counter-wildlife trafficking efforts like transit location and airline were available for less than 35% of the seizures collected.

Finally, data contained within the C4ADS Air Seizure Database is constantly being revised and updated to reflect the most current and accurate information available. As a result, changes are occasionally made to previous seizure data that may impact the analysis. There may therefore be some differences between the analysis presented in this year's report, *Flying Under the Radar* (2017), and *In Plane Sight* (2018).

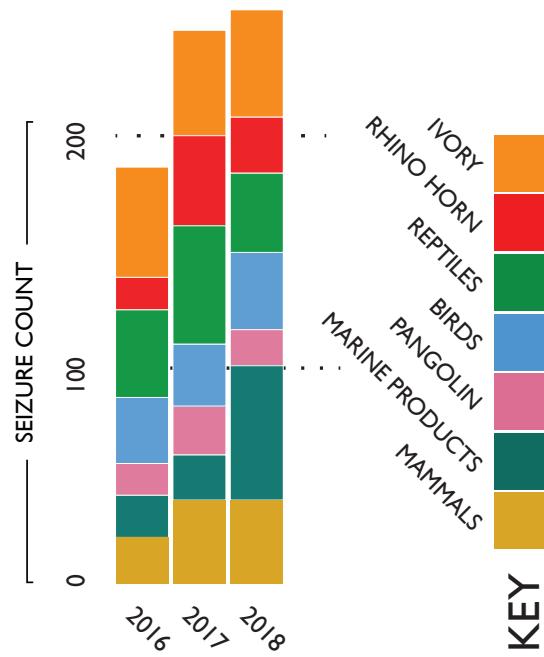


Figure 1. The number of air seizures contained within the C4ADS Air Seizure Database by category (2016 – 2018)

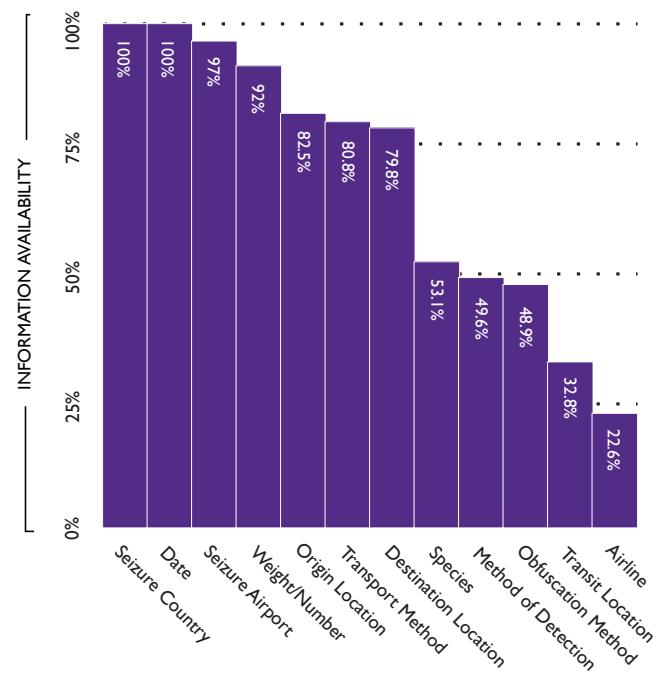


Figure 2. Data availability for the seizures within the C4ADS Air Seizure Database (2016 – 2018)

APPENDIX III:

Recommendations – Further Detail and Guidance

Further detail for each recommendation in this report is included below, alongside guidance on how to implement each recommendation whenever possible.

AWARENESS

1. Increase awareness among air passengers, aviation staff, freight forwarders, shippers, and enforcement officials.



Increased awareness of the issue of wildlife trafficking through the air transport sector amongst all affected parties will lead to more seizures of illegal wildlife and wildlife products. Informed passengers will be more likely to report suspicious activity to airline and airport personnel, and will be less likely to unwittingly purchase illegal wildlife goods. Aviation industry staff and enforcement will be more likely to recognize illegal consignments and suspicious behavior.

Common awareness raising efforts involve putting up anti-wildlife trafficking posters or displays in airports (Jomo Kenyatta Airport and Guangzhou Baiyun Airport, for example, both clearly exhibit anti-wildlife trafficking messages and posters) and in-flight messages or materials.

Wildlife trafficking awareness training and materials can be tailored and delivered to customs, enforcement, and appropriate aviation industry personnel by government agencies; nongovernmental organizations; trade associations like the International Air Transport Association (IATA) and Airports Council International (ACI); and broader partnerships like ROUTES and United for Wildlife. For example, the ROUTES Partnership has created wildlife trafficking awareness materials and toolkits (including infographics, handouts, customizable graphics, etc.) that can be downloaded and used by air transport companies.¹

2. Adopt or create a pamphlet or tool tailored to each country to help customs and enforcement officials, as well as relevant industry personnel, identify restricted species and wildlife products commonly trafficked through their territory.



One significant impediment to increased wildlife seizures is the frequent inability of customs and enforcement officials to determine which wildlife species or products are subject to protections.

A number of nonprofits and intergovernmental organizations have developed methods to address this issue.² For example:

- CITES produces and publishes identification guides for a wide variety of animal and plant species. The guides are available here: www.cites.org/en/resources/wiki_id.php (note: the search function for “genus” seems to return more results than the “common name” search).
- Freeland, a nonprofit dedicated to tackling wildlife trafficking and human slavery, released a mobile phone application in 2016 to assist law enforcement agencies in the identification and handling of trafficked species.^{xiv} WildScan can be downloaded for free on Apple and Android devices, and is currently available in English, Khmer, Bahasa Indonesian, Thai, and Vietnamese.
- Tikki Hywood Trust, a Zimbabwean nonprofit dedicated to conservation, education, and legislation, has developed a handbook to assist all relevant enforcement stakeholders in assessing and docketing identified wildlife crimes appropriately.^{xv} This approach could be repurposed to include information on the identification of species relevant to particular jurisdictions.
- TRAFFIC, the wildlife trade monitoring network, has produced a number of identification guides for wildlife species commonly traded in Southeast Asia. Each guide has been produced in English, Mandarin, Japanese, and ten ASEAN languages. The guides can be retrieved at www.traffic.org/identification.³

3. Ensure public reporting mechanisms are in place and well-known so passengers can report suspected wildlife trafficking instances.



Airline passengers are well-positioned to witness and report on potential wildlife trafficking instances. However, at present, there is no known mechanism for passengers to report suspected wildlife trafficking to enforcement or industry personnel.

Suspected wildlife trafficking reporting mechanisms should be developed for passengers and publicized within airports (e.g. banners or displays) to raise awareness (see **Recommendation 6** for more detail on two potential reporting mechanisms). Materials developed to promote the mechanism should include not only red flags (“what to watch out for”), but also what types of information should be reported (e.g. flight number). A well-designed reporting mechanism would incorporate a tool to reduce false positives and extract the most promising reports of illegal wildlife trafficking activity. Law enforcement engagement and cooperation will be necessary to design a reporting mechanism that works well. Note that creating a system that allows informants to remain anonymous will likely encourage reporting on suspected trafficking instances.

² For support creating a pamphlet tailored to a specific area, contact C4ADS at info@c4ads.org.

TRAINING

4. Provide training on red flag indicators associated with wildlife traffickers and shipments.
Ensure that follow-up trainings are provided as necessary to support uptake.



Customs, enforcement, and aviation industry staff would benefit from periodic trainings on the identification of all types of illegal activity.

Common red flags for passenger behavior include anxious behavior and bulging clothing. Common red flags for air waybills include inconsistent weights, shipments of low-value bulk goods, partial or non-existent shipper or consignee information, an unusually low estimated price given the declared products being shipped, inconsistent information (e.g. used tire products being shipped to “ABC Furniture Company”), etc. Because these red flags are not specific to wildlife, additional training on these and other red flag indicators should lead to increased seizures of wildlife, drugs, weapons, and other illicit goods. As a result, additional training on these topics could likely be folded into existing trainings on how to identify trafficking activity.

Training programs should be tailored for relevant personnel, and should differentiate between red flags for different customs screening procedures (e.g. passengers, air freight/cargo, mail/post), and different types of customs screening (e.g. document screening, equipment screening, sniffer dogs, etc.). Follow-up trainings should be provided after the initial training to ensure the training program’s effectiveness.

Screening trainings can be provided by organizations like the WCO and its partners, which provides training modules on countering illicit wildlife trafficking through the air cargo segments of the Container Control Programme (CCP) of its Aircop project, which aims to train customs and other law enforcement officers in the air cargo and air passenger domains. Other customs and enforcement agencies like the US Transportation Security Administration (TSA), and US Customs and Border Protection (CBP) have provided similar training programs in the past.⁴

5. Incorporate training for airline staff on how to safely handle trafficked live or dead animals after discovery into existing training programs. Create and provide “forensic protection protocols” training to preserve evidence for trial.



In Flying Under the Radar, C4ADS recommended that protocols be developed to help airline employees handle animals immediately after discovery to ensure the safety of airline personnel and passengers, as well as the safety of the animals themselves. In particular, C4ADS recommended that staff be trained to deal with 1) wildlife that gets loose or is discovered in flight, and 2) dead animals, without creating a health risk for employees or passengers.

In 2017, IATA, as part of the ROUTES Partnership, developed guidance on how to safely handle escaped animals in cabins. These guides should be incorporated into existing training programs as appropriate to ensure that aviation industry personnel are equipped to deal with wildlife safely.⁵

Similarly, training should be developed to ensure customs, enforcement, and aviation industry personnel know how to preserve forensic evidence associated with seizures of wildlife and wildlife products. This is often crucial for seizures that progress to prosecution.

ENFORCEMENT

6. Develop clear escalation procedures³⁴ upon discovery of potential illegal activity.



At present, aviation industry personnel in general do not have an established protocol for alerting enforcement to potential wildlife trafficking instances.⁶ Instituting clear and consistent escalation procedures will help to ensure that trafficking activity is promptly reported and addressed. To do this, the aviation industry will need to be aware of the relevant points of contact within specific customs or enforcement agencies.

Note, however, that customs and enforcement may be reluctant to provide specific contact details due to concern about potentially being inundated with false leads, or leads without sufficient detail for follow up. To deal with this issue, wildlife trafficking hotlines (phone- or web-based) could be created that provide specific submission templates. For web-based hotlines, this could be as simple as including a “Suspected Trafficking Incident” reporting form on customs or enforcement websites, with specific boxes to fill in (e.g. “Type of trafficking incident (select one),” “Reason for suspicion,” “Airline & flight number,” “Contact details if follow up is needed (optional)” etc.). A phone-based hotline might be designed to walk informants through a series of prompts to gather requisite information.

Either option will require that a person or computer program quickly filters through submitted tips to identify the most promising leads before the potential trafficker or illicit shipment leaves the airport. If the suspected trafficker or shipment does manage to get on a flight, established communication channels and e-documentation systems (see Detection below) can help alert officials at their destination prior to their arrival. Note that developing effective escalation procedures will require the cooperation of customs and enforcement agencies.

⁶ “Escalation procedures” in this case means established communication channels and processes that move a report of possible illegal activity to enforcement officials with the power to act.

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7. Engage with the private sector to ensure that aviation personnel are aware of the types of information needed to follow up on reports of wildlife trafficking. Provide feedback to industry and the public on the outcomes of submitted tips.



To ensure that submitted tips on potential trafficking instances are useful, customs and enforcement should work with industry to determine specific categories of necessary information that industry personnel can provide in the event that potential trafficking activity is identified. These categories could then be included within reporting mechanism templates (see **Recommendation 6**).

To encourage proper reporting, customs and enforcement should find a way to provide appropriate feedback to industry and the public on the results of submitted tips. Ideally, this would be accomplished by sending direct feedback to informants via email or phone (provided they did not submit information anonymously). Feedback could also be gathered and provided to companies and the public in the form of an annual report or statement, including information on how many submitted tips resulted in seizures. However, considering resource constraints and confidentiality concerns, this could also be accomplished by simply posting a press release to customs websites after seizures including whatever information can be made publicly available (see **Recommendation 17**).

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8. Develop post-seizure procedures to safely and securely store wildlife products or ensure the proper care of trafficked live animals. Develop procedures to track seized live animals and wildlife products.



In some locations, customs officials may be reluctant to stop illegal wildlife traffickers or shipments due to a lack of post-seizure procedures or accommodations, such as an appropriate facility to care for exotic live animals. In other cases, customs officials may seize illegal wildlife and store it according to existing procedures, only for the product or animals to be trafficked back into the illegal wildlife trade.^{7 8}

Where post-seizure procedures do not exist, customs should work to build a comprehensive post-seizure process and disseminate it to all relevant officials. Illegal wildlife products should be stored in an existing secure warehouse for confiscated contraband, or within a new secure facility, with multiple checks in place to prevent seized products leaking back into the illegal market. In Kenya, for example, seized ivory is stored in two vaults behind steel doors with multiple locks, defended by armed guards.^{xvi}

For live animals, a suitable wild animal rescue center, veterinary practice, or zoo must be identified which can provide treatment, care, and rehabilitation for large numbers of animals with little warning. Any selected facility must be carefully vetted to ensure the security of the animals in their care. Note that CITES provides guidelines⁹ to assist countries in identifying the proper course of action (reintroduction to natural habitat, return to the state of export, captivity, or euthanasia) for seized animals, depending on conservation status and health needs.^{xvii}

Due to the possibility that seized animals or products might re-enter the illegal wildlife trade, customs agencies should ensure that procedures are in place to track the live animals and wildlife products they have confiscated. Each animal or wildlife product should be catalogued and its whereabouts clearly stated within a specially designated location, perhaps within a seizure database (see **Recommendation 16**), or a separate database specifically designed for that purpose. Regardless, the information should be updated periodically to ensure that the animal or product is still accounted for. If anything is found to be missing (particularly if they are found to be missing in large quantities), an investigation should be initiated to locate them.

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9. Dedicate additional resources to combatting the illegal wildlife trade in common hub airports exploited by wildlife traffickers.



Flying Under the Radar, *In Plane Sight*, and *Runway to Extinction* have all illustrated that large international hub airports are crucial to the illegal wildlife trade. However, many of the same qualities that make hub airports vulnerable to trafficking—such as their wide selection of available flight routes, location, and size—make them a popular choice for travelers, and can create a capacity problem for customs and enforcement screening. This is particularly true for passengers and shipments transiting through hub airports; tight turnaround times and high volumes of transiting passengers and cargo make transit customs screening difficult at best (see **Recommendation 10**). Still, the vital role many hub airports play in the illegal wildlife trade must be addressed.

There are a number of potential options available to improve customs screening and reduce aviation industry vulnerability to wildlife trafficking without overburdening officials and aviation industry employees. One way to do this would be to invest more heavily in wildlife sniffer dogs, which are able to screen large numbers of people, luggage, and shipments extremely quickly; for example, in a 2016 Smithsonian documentary about Frankfurt Airport, a sniffer dog checked 40 suitcases for drugs in 100 seconds.^{xviii} Another solution would be to shift from paper-based documentation to e-documentation. Once implemented, e-documentation systems could incorporate customs screening technology and equipment designed to automatically identify red flags for trafficking activity, including wildlife trafficking (see **Recommendation 19**). Both options would increase customs and enforcement's ability to screen outbound, transit, and incoming flights relatively quickly.

⁷ In one instance in 2015, Vietnamese officials seized "42 live, critically endangered" pangolins and delivered them to forest rangers, presumably for rehabilitation. The forest rangers instead sold all 42 animals to local restaurants, claiming that "the animals were too weak to be rescued anyway." Source: Bryce, Emma. "Critically Endangered Pangolins Rescued, Then Sold as Food." The Guardian. 20 Feb. 2015. www.theguardian.com/environment/world-on-a-plate/2015/feb/20/critically-endangered-pangolins-rescued-then-sold-as-food.

⁸ Before Spain designated a rescue center to receive rescued wildlife, "some of its seized animals went to a zoo now under investigation for ties to the illegal wildlife trade." A nonprofit organization, Animal Advocacy and Protection, is now Spain's designated rescue center. According to Raquel Garcia, head of public policy for the organization, "We bring [the animals] in, rehabilitate them if they're social animals, and make sure they're placed in a legitimate location." Source: Actman, Jani. "What Happens to Smuggled Animals After They're Seized?" National Geographic. 30 Sep. 2016. http://news.nationalgeographic.com/2016/09/wildlife-watch-animals-seized-smugglers/.

⁹ See Resolution 17.8 on Disposal of Confiscated Illegally Traded Specimens of CITES-Listed Species at the following link: www.cites.org/sites/default/files/document/E-Res-17-08.pdf.

10. Develop or enhance customs screening procedures for transit flights.



Most customs officials currently have limited ability to screen passengers and shipments in transit, putting the burden of detection almost entirely on origin and destination locations. They are also hampered by the short turnaround times for connecting flights, which do not allow enough time to effectively screen passengers, luggage, cargo, and postal mail. If customs screening could be increased in transit, officials would have an additional opportunity to stop illegal wildlife trafficking.

This is, of course, only possible in certain circumstances. For example, when passengers and shipments have extremely short layovers, adding another layer of complication is generally not feasible. In instances where a flight lands to offload some passengers and re-fuel before flying to another destination, many passengers and their luggage will not even exit the plane, and therefore cannot be screened. Note that it is possible that traffickers are aware of this and take advantage of these types of flight schedules when planning their route.^{xix}

Although customs and enforcement will likely not be able to remove these vulnerabilities entirely, both the deployment of sniffer dog teams and e-documentation systems would help. Sniffer dogs in particular could assist with customs screening during short layovers, perhaps by screening passengers on high-risk flights as they disembark (or, in the cases of checked luggage, air freight, or postal mail, as they are offloaded). Risk screening systems associated with e-documentation could send alerts on high-risk transiting passengers or cargo forward to customs during flights, allowing officials to prepare for the flight's arrival and screen only those people, suitcases, or shipments that have been flagged by the system (see **Recommendation 18**).¹⁰

11. Customs and enforcement should be aware of flight routes opening through high-risk areas.



Wildlife traffickers have been known to shift their operations on occasion to take advantage of opening flight routes through jurisdictions they consider more advantageous.¹¹ To anticipate these changes, officials should keep track of opening flight routes to and from high-risk jurisdictions for their particular airport. For example, countries with in-demand reptile species should be wary of opening flight routes to common reptile demand countries in Southeast Asia, Europe, and the Americas (and vice versa).¹²

Similarly, airlines should understand the implications of flight routes between significant source or origin countries and demand countries for in-demand wildlife. If a planned flight route will be at a high-risk for bird smuggling, airport awareness displays or in-flight materials could help to reduce the route's vulnerability to exploitation, and could increase the chances that bird trafficking instances will be discovered and properly reported by well-informed passengers or staff.

Airlines should also clearly communicate plans for new flight routes to relevant customs and enforcement officials. If the proper communication channels do not already exist, coordination will be necessary to ensure that airlines are reporting to the appropriate authorities.

12. Develop and maintain a comprehensive internal database of entities previously involved in wildlife seizures.



Due to lenient penalties for wildlife trafficking crimes and a lack of coordination and communication between customs and enforcement agencies, repeat offenders frequently pass through airports unimpeded. To counter this threat more effectively, customs and enforcement should first take note of individuals and companies that have previously been involved in wildlife seizures in their jurisdictions (e.g. entities that have shipped, transported, trafficked, purchased tickets for, or were intended to receive trafficked wildlife or wildlife products). The names and identifiers of these people and companies should then either be stored in a comprehensive database of wildlife offenders, or should be added to existing databases of suspect entities.

A useful database would be computer-based, managed by one designated individual or agency, and continuously updated with detailed information on relevant entities. For an individual, necessary information would include: name, age, a photo (or physical characteristics), passport information, and detailed information on past seizures. For a company, the following categories would be relevant: name, phone numbers, addresses, point of contact, and detailed information on past seizures. The seizure entities database would ideally be either a part of, or linked to, the database used for seizure information (See **Recommendation 17**). In the absence of sophisticated technology like Palantir or i2, a simplistic way to store such information would be in an encrypted Excel file.

13. Develop a system to test counter-wildlife trafficking protocols.



After the implementation of updated or new counter-wildlife trafficking protocols, such as improved customs screening procedures for wildlife, customs and other enforcement officials should attempt to assess their effectiveness. Covert testing is the most reliable way to determine enforcement success rates, as most other methods attempt to estimate the volume of trafficking activity that was not identified within a certain timeframe.

¹¹ See **New Flight Routes, Organized Crime, & Totoaba** in this report and **Shifting Transit Routes, Narcotics, and Reptiles** in *Flying Under the Radar*.

¹² Note that this will require that officials are familiar with species commonly trafficked through their country, as well as with those species' common origin or destination countries.

Effective testing should be convincing, varied, and occur on multiple occasions to track changes in enforcement success over time. Results and findings should be presented in de-briefs to leadership and relevant officials.

The US TSA conducts covert testing of security systems within the United States and abroad using trained “Red Teams” from the Department of Homeland Security. Red Team members generally carry fake improvised bombs and attempt to successfully pass through airport security.^{xx} This strategy could be altered slightly to test customs screening protocols for the detection of illegal wildlife.

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14. Improve wildlife customs screening requirements for postal mail shipments. Ensure mail seizures are reported to the same degree as passenger, checked luggage, or air freight seizures.



Screening for postal mail shipments—or shipments sent via a postal service—is primarily focused on security threats. For example, a poster created by the US Postal Service (USPS) entitled, “Suspicious Mail or Packages,” helps mailroom staff detect packages likely containing explosives or radiological, biological, or chemical threats.¹³

Since customs screening is the primary means by which wildlife trafficking instances are discovered, many live animals and wildlife products have likely escaped detection in postal packages. For example, between January and June 2016, the UK ran an operation targeting mail shipments en route to mainland China.^{xxi} During the course of the operation, UK officials made 50 wildlife seizures “involving a total of 153 [ivory] specimens and an additional 39 kg of African Elephant carvings....”^{xxii} In other words, UK officials made an average of 8.3 ivory seizures a month from mail shipments alone. A similar operation in a more significant country for ivory trafficking would likely have found far more.

Although mail seizures seem relatively infrequent, this could partially be an effect of how rarely mail seizures are publicly reported. To counteract the impression that mail shipments undergo little customs screening, and to publicize customs and enforcement successes, national postal services should establish internal and external seizure reporting mechanisms.¹⁴ This will both ensure that seizure analyses based on public data are more accurate, and will broadcast to traffickers that national postal services should not be considered an easy way to move illegal products.

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15. Increase cooperation with other customs and enforcement agencies along high-risk supply chains.

Inform foreign agencies of seizures on flights that have left or are destined for their countries.



Customs and enforcement agencies should work to collaborate with other agencies along high-risk supply chains, both to disseminate seizure information and to monitor wildlife trafficking networks that appear to be operating in multiple jurisdictions.

Whether or not close collaboration is possible between agencies in different countries, customs should at least disseminate information on seizures that occurred at destination airports to the country the involved flights originated from, and should inform countries of seizures that occurred at origin prior to arriving in their airports.

SEIZURE REPORTING

16. Store collected seizure information in one centralized database.



Consolidated seizure reporting provides customs and enforcement officials with a way to track their own success rates, as well as monitor shifting trafficking patterns and methods over time. Furthermore, maintaining detailed seizure records can help identify future trafficking instances involving repeat offenders or common trafficking methods (see **Recommendation 12**). Note that this recommendation applies not only to wildlife seizures, but to seizures of other contraband as well. Consolidating information on seizures of all types can help to identify overlap between and within trafficking networks.

In order to collect seizure data for inclusion in a seizure database, customs and enforcement agencies should have standardized reporting procedures, or a seizure reporting mechanism, in place to ensure that officials report seizures systematically. A successful mechanism will be relatively simple and easy to understand, and will be accompanied by training of customs and enforcement officials on reporting protocols. All customs and enforcement officials should be made aware of the reporting protocols relevant to their positions.

In some countries, seizure information is held only by the agency that made the actual seizure, and is not shared across all relevant customs and enforcement agencies.¹⁵ In these and other cases, seizure information is often stored in hard copy, preventing easy dissemination or storage of the seizure data. To avoid these issues, a seizure database should be computer-based, managed by a few designated individuals or one agency, and continuously updated with detailed information. Regardless of the database manager, all relevant enforcement agencies should have access to the database.

13. See https://about.usps.com/publications/pub166/pub166_tech_015.htm for USPS guidelines on how to detect and safely address likely security threats in mail packages. See https://about.usps.com/publications/pub166/images/pub166_tech_015_1.jpg for the “Suspicious Mail or Packages” poster.

14. Australian authorities are particularly adept at identifying trafficking attempts in mail shipments and subsequently publishing seizure press releases describing each seizure. Customs and enforcement in other countries could use Australian protocols as a model to improve mail screening and reporting in their own countries. See <https://newsroom.abf.gov.au/releases/more-than-110-native-reptiles-saved-from-illegal-export> for an example press release issued by the Australian Border Force after a series of reptile smuggling attempts were discovered in the mail.

15. A May 2015 report undertaken on behalf of the Department of National Parks and Wildlife of Malawi included Malawi’s wildlife seizure data from 1989 to 2014. The report’s authors gathered the data from a variety of different Malawian government agencies that had compiled their own internal seizure databases in hard copy. According to the report, “...reviewers found there to be a lack of reliable available data, making it is [sic] almost impossible to identify detailed crime patterns or trends. Several agencies seemed to have not historically recorded or retained wildlife crime data, and those that did often stored it in hard copy only, making it very difficult to access and analyse. In total, 50 wildlife crime cases were analysed by reviewers, the majority of which were ivory offences at airports.” Source: Waterland, Shelley, et. al. *Illegal Wildlife Trade Review Malawi*. German Federal Ministry for Economic Cooperation and Development (BMZ) through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; German International Cooperation, Lilongwe Wildlife Trust, Born Free Foundation, and the Department of National Parks and Wildlife of Malawi, May 2015. www.lilongewildlife.org/wp-content/uploads/IWTR-Review-Malawi.pdf.

In the absence of sophisticated technology like Palantir or i2, a simplistic way to store such information would be in an encrypted Excel file. If linked entity information will be held in a separate database (see **Recommendation 12**), the seizure database should refer or somehow link to the entity database, making sure to connect each entity to specific seizures.

The more detailed seizure information is, the more can be done with it; given time and capability constraints, however, consistently compiling and storing detailed seizure information may not be feasible. See **Appendix IV** for a seizure reporting template containing the baseline of information that should be collected and stored after seizures. Routes information (origin, transit, and destination locations) is included to understand wildlife movements and fill in some of the knowledge gaps created by relying on seizure information alone. The ability of customs and enforcement agencies in multiple countries to access portions of this data (see **Recommendation 15**) would be particularly helpful to bridge wildlife trafficking knowledge gaps. Transport method information (passenger, checked luggage, air freight, etc.) should also be included to help officials and industry target wildlife trafficking activity more effectively. Note that other organizations like the WCO and CITES have also created seizure reporting templates (see **Appendix IV**).

Once a database is designed and put to use, officials should be able to easily organize and partition information for CITES reporting and for other purposes. For example, if an official would like to identify past seizures using a specific type of obfuscation method, they should be able to search for the method in question and quickly compile a list of relevant seizures. One example of an existing database with this capability is the EU TWIX database.

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17. Develop a procedure to publicly report seizure information. Update seizure press releases with prosecution results.



Publishing seizure reporting, either on a website or in periodic public reporting, provides clear evidence that enforcement efforts are effective in preventing trafficking.

Once a reporting mechanism is developed and implemented, seizure information should be released to whatever extent possible, preferably in the form of press releases. Providing public seizure data will allow for the creation of a positive feedback loop between enforcement, industry, and nongovernmental organizations. For example, more seizure data improves the type of analysis done in this report, which in turn informs enforcement about global trafficking trends and patterns. Furthermore, publishing information on seizures can provide positive feedback to individuals and industry personnel who report suspicious activity, encouraging more people to come forward and do the same. Still, some information will likely need to be kept confidential to protect ongoing investigations.

Whenever possible, seizure press releases should include—or be updated to include—prosecution results for individuals and companies implicated in wildlife seizures. Publishing this information is a great way to deter potential traffickers by publicizing that enforcement is taking wildlife crime seriously.^{xxiii}

The Hong Kong Customs and Excise Department,¹⁶ the South African Revenue Service (SARS),¹⁷ and Australian Border Force (ABF),¹⁸ for example, maintain websites for departmental press releases on seizures and other developments. Hong Kong Customs also releases their own statistics on their caseload, seizures, and arrests over time.¹⁹ Some customs and enforcement agencies also maintain social media accounts where they post seizure information and other relevant news. These reporting strategies are good models for those seeking to publicize their enforcement successes. See the ROUTES Partnership's Wildlife Seizure Press Releases: A Best Practice Guide²⁰ for seizure reporting templates and more information on how to create an informative press release.

POLICY

18. National laws should, at a minimum, enforce CITES regulations and regulate the domestic trade in non-native species. Penalties for wildlife trafficking should be raised until they are sufficiently deterrent.



Wildlife trafficking legislation is often relatively lax; some CITES Parties do not even fully enforce CITES regulations, even though they are legally bound to do so.²¹ Thailand, for instance, does not fully regulate the domestic trade in non-native species, nor does it require that wildlife traders provide proof that their animals were legally imported, creating substantial loopholes that can be exploited by wildlife traffickers.^{xxiv} In other countries, wildlife trafficking penalties exist, but account for a small fraction of the value of trafficked species or wildlife products. In still other countries, existing wildlife legislation is sufficient, but is often not enforced by customs and enforcement, who prioritize penalizing other crime types.

Inconsistent wildlife legislation and enforcement create space for wildlife traffickers to continue operating relatively safely in certain countries, and are a large part of the reason that repeat offenders are so prevalent within wildlife crime.

To address these issues, countries should examine their wildlife trafficking legislation to determine whether it is sufficiently strict to create a deterrent effect, and if it is, whether the existing laws are consistently enforced. At a minimum, CITES regulations should be enforced, and the trade in both native and non-native species should be regulated and monitored. Ideally, fines should be raised until they represent a significant portion of the value of the trafficked species or product, and repeat offenders should receive harsher penalties to dissuade their continued involvement in the illegal wildlife trade. Finally, wildlife laws should allow for and encourage seizure follow-up and investigations to identify the

16 See www.customs.gov.hk/en/publication_press/press/index.html for Hong Kong press releases.

17 See www.sars.gov.za/Media/MediaReleases/Pages/default.aspx for South African press releases.

18 See <https://newsroom.abf.gov.au/releases> for Australian press releases.

19 See www.customs.gov.hk/filemanager/common/pdf/statistics/enforcement_cases_en.pdf for an example.

20 See https://routesppartnership.org/industry-resources/guidance-documents/guidance-documents-l/routes_praidememoire.pdf/view

21 "After over five years of Article XIII proceedings, the CITES Standing Committee should consider finally suspending trade with Lao PDR." Environmental Investigation Agency (EIA). 15 Aug 2019. <https://eia-international.org/wp-content/uploads/EIA-document-Tiger-trade-in-Lao-PDR-and-call-for-trade-susensions-at-CITES-SC7I.pdf>.

individuals ultimately responsible for wildlife trafficking networks' activities.

DETECTION

19. Pursue shift towards electronic paperwork for air freight and updated technology for customs screening. Expand advanced cargo and passenger information systems to include red flags for the illegal wildlife trade. Incorporate CITES e-permits in e-documentation systems.



Steadily increasing passenger and cargo volume has put pressure on existing customs screening and enforcement procedures that are straining to deal with the increase.^{xxx} Implementing e-documentation technology and employing new technologies, such as sniffing machines,²² can take pressure off overwhelmed customs officials and expedite the passenger and cargo screening processes.

Furthermore, e-documentation systems can incorporate risk management systems designed to identify suspect activity, thereby improving interdiction success rates. E-documentation risk management systems can also alert customs and enforcement of inbound passengers or shipments that display multiple red flags for trafficking activity, based on pre-established risk factors. In addition, the speed with which documentation can move through an e-documentation system could both improve official response times and, through integrated messaging, increase communication between different national customs and enforcement agencies. Finally, the use of CITES e-permits hampers the ability of wildlife traffickers to use and re-use fraudulent CITES permits.

Note that e-documentation systems are most effective when broadly implemented; lagging technology in certain airports will necessitate retaining paper customs and shipping documents to some extent, and will prevent the realization of the full benefits of a technologically enhanced transport system. Dedicating additional resources to updating the technological capabilities of specific airports should therefore have a significant positive impact on the entire air transport sector.

²² Sniffing machines are currently used to detect drugs and explosives in airports to protect sniffer dogs from inhaling dangerous chemicals. The machines also have the added benefit of not requiring breaks or exercise, and tend to be more accurate than sniffer dogs. They may, however, be more susceptible to interference from corrupt industry employees. Source: <https://www.wired.com/2002/04/sniffing-out-bombs-canine-vs-machine/>

APPENDIX IV:

Seizure Reporting Template

In an attempt to reduce the amount of time and effort needed to track seizures, C4ADS designed the below template as a simplistic framework for seizure reporting. A more detailed seizure reporting template is included in WCO's Customs Enforcement Network (CEN) platform.²³

Case Number:			Seizure Date:		
Suspect 1: Name:	Sex:	Age:	Nationality:	Passport:	Repeat Offender: Y/N
Suspect 2: Name:	Sex:	Age:	Nationality:	Passport:	Repeat Offender: Y/N
Contraband Seized 1:			Weight/Number:		
Contraband Seized 2:			Weight/Number:		
Airline:			Flight No.:		
Origin:		Transit Location(s):		Destination:	
Transport Method: (Check one)	Air Freight	Luggage	Passenger Carry-on	Passenger Clothes	Other
Number of Suitcases or Freight Parcels:					
Obfuscation Method / Cover Load (e.g. tin foil, garlic):					
Manner of Detection (e.g. intelligence, risk profiling, X-ray revealed suspicious object):					
Suspect(s) History:					
Additional Details:					
Evidence Held By:			Report Written By (Printed Name, Sign, Date):		

²³ For more information on CEN, see www.wcoomd.org/en/topics/enforcement-and-compliance/instruments-and-tools/cen-suite/cen.aspx. For the CITES seizure reporting template, see <https://cites.org/sites/default/files/notif/E-Notif-2016-007.pdf>.

APPENDIX V:

R Packages

The following R packages were used in the creation of this report:

- **ggplot2**—H. Wickham. *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York, 2009
- **dplyr**—Hadley Wickham and Romain Francois (2016). *dplyr: A Grammar of Data Manipulation*. R package version 0.5.0. <https://CRAN.R-project.org/package=dplyr>
- **extrafont**—Winston Chang, (2014). *extrafont: Tools for using fonts*. R package version 0.17. <https://CRAN.R-project.org/package=extrafont>
- **RColorBrewer**—Erich Neuwirth (2014). *RColorBrewer: ColorBrewer Palettes*. R package version 1.1-2. <https://CRAN.R-project.org/package=RColorBrewer>
- **ggalt**—Bob Rudis (2016). *ggalt: Extra Coordinate Systems, Geoms and Statistical Transformations for ‘ggplot2’*. R package version 0.1.1. <https://CRAN.R-project.org/package=ggalt>
- **maps**—Original S code by Richard A. Becker; Allan R. Wilks. R version by Ray Brownrigg. Enhancements by Thomas P Minka and Alex Deckmyn. (2016). *maps: Draw Geographical Maps*. R package version 3.1.1. <https://CRAN.R-project.org/package=maps>
- **geosphere**—Robert J. Hijmans (2016). *geosphere: Spherical Trigonometry*. R package version 1.5-5. <https://CRAN.R-project.org/package=geosphere>
- **cobs**—Pin T. Ng and Martin Maechler (2015). *COBS -- Constrained B-splines (Sparse matrix based)*. R package version 1.3-1. URL <http://CRAN.R-project.org/package=cobs>
- **circlize**—Gu, Z. (2014) *circlize implements and enhances circular visualization in R*. Bioinformatics.
- **riverplot**—January Weiner (2017). *riverplot: Sankey or Ribbon Plots*. R package version 0.6. <https://CRAN.R-project.org/package=riverplot>

Endnotes

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- vii Engel, Gregory A. and Fiona Besnard. Human-Nonhuman Primate Disease Transmission. 16 April 2017. <https://onlinelibrary.wiley.com/doi/full/10.1002/9781119179313.wbprim0374>. ; "Origin of HIV & AIDS." Avert, 8 May 2018. www.avert.org/professionals/history-hiv-aids/origin. ; Hines, Ron, DVM PhD. "From Monkeys to Man and Vice Versa: Are There Any Diseases My Family or I Can Catch From Pet Monkeys?" www.2ndchance.info/mnky2man.htm. ; Nordqvist, Christian. "Origins of the Black Death Traced Back to China, Gene Sequencing Has Revealed." Medical News Today. Healthline Media UK Ltd., 1 Nov. 2010. www.medicalnewstoday.com/articles/206309.php.
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- x "EU TWIX." EU-TWIX. 2016. <http://eu-twix.org/>.
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- xxv Neffenger, Peter V. "TSA Security Gaps." Statement before the United States House Committee on Oversight and Government Reform, 3 Nov. 2015. www.tsa.gov/news/testimony/2015/11/03/testimony-hearing-tsa-security-gaps.

