



Cargo of cruelty

How Ethiopian Airlines is fuelling global wildlife trade



Contents

World Animal Protection is registered with the Charity Commission as a charity and with Companies House as a company limited by guarantee. World Animal Protection is governed by its Articles of Association.

Charity registration number
1081849

Company registration number
4029540

Registered office 222 Gray's Inn
Road, London WC1X 8HB

Cargo of cruelty: How Ethiopian Airlines is fuelling global wildlife trade

Executive summary	03
Welfare concerns	03
Conservation concerns	04
Biosecurity and public health concerns	04
Legality	04
It's time to act. Ethiopian Airlines can become a wildlife-friendly corporate	04
Introduction	05
Research methods	07
Findings - West Africa as a trade hub	08
Spotlight on Ethiopian Airlines	13
Business growth and ambitions	13
Findings - Ethiopian Airlines evidence	14
Welfare concerns	17
Conservation concerns	28
Biosecurity concerns	34
Legality	41
Covid-19 - business as usual	49
Conclusion	50
The global wildlife trade must not fly (Call to action)	51
References	52

Cover image: Screenshot from Facebook

Executive summary

West Africa is not only becoming a transit area for wildlife from Central Africa¹, but also a wildlife trade hub as the source of several species of wild animals. For instance, Togo is recognised as one of the main reptile exporters of West Africa, with several species harvested, farmed or born in captivity to supply the international exotic pet trade^{2 3}. With cargo and passenger planes being used to transport these animals around the world, the aviation industry is helping to facilitate this trade. As transnational (global) commercial transport expands, so do opportunities to ship live wildlife and their derivatives across borders.

A recent scientific review analysed more than 900 social media posts from two Facebook accounts (dated 2016-2020) known to be involved in the trade of wildlife from snake farms in Togo, West Africa. This report highlights how Ethiopian Airlines – currently the largest aviation group in Africa – is one of the main airlines shipping wild animals from the continent. Between 2016 and 2020, at least 25 different species of wildlife, including reptiles, mammals, invertebrates and amphibians featured in at least 30 Ethiopian Airlines shipments.

We examine the cruelty and impact of this commercial international trade by looking through the lens of animal welfare, conservation, legality, biosecurity and public health risks. We call on Ethiopian Airlines to become a wildlife-friendly corporate by stopping the shipment of wild animals, and we call on governments to strengthen enforcement of wildlife protection laws and practices.

Welfare concerns

Wild animals are sentient beings^{4 5}, and those caught in the wildlife trade experience pain and suffering from cruel capture methods and poor welfare standards during transit and in captivity.⁶

- Reptiles such as Ball pythons and tortoises are forcefully taken from the wild and transported to snake farms in sacks, practices that can inflict physical injuries and can even lead to death.
- Methods used to capture African grey parrots are also inherently cruel. An injured lure bird is typically used to attract other birds by screeching. These highly social and investigative birds are subsequently trapped by a sticky substance painted on the branches. Data focused on some trade routes have estimated that up to 60% of African grey parrots captured from the wild will die before they even reach a market.
- Images of snake farms uncovered in our investigation showed animals in overcrowded, barren containers, typically with no enrichment provision whatsoever.

The only way to stop this chain of suffering is to keep animals in the wild, where they can lead a life free from the physical and mental deprivation of captivity.



Photo: Various internet sources suggest that genets are increasingly popular as exotic pets, as are civets, despite their association with zoonotic disease emergence and transmission. This investigation found these species to be available for sale and export from West Africa with genets being the most frequently advertised type of mammal.

Conservation concerns

This investigation found most (more than 70% of pre-shipment and more than 90% of shipping Facebook posts) of the species identified were reptiles, of which a substantial proportion came directly from the wild. Whether classified as either Vulnerable, Endangered, or Critically Endangered by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species⁷, the wild population trend of most of the species observed in this trade is scientifically unknown, or are currently considered to be in decline.

This suggests severe uncertainty in terms of the sustainability of taking animals from the wild. Reptiles such as Ball pythons are sourced from snake farms that operate as ranches. However, the acquisition of breeding stock and dependence on wild-sourced animals to sustain these ranches is a concern⁸. So too is the risk of pathogen and genetic pollution via improper release of some snakes back into the wild.⁹

Biosecurity and public health concerns

The different links in the commercial wildlife trade chain (capture, holding areas, transportation and final destination) create opportunities for infectious zoonotic diseases to emerge¹⁰. More than 70% of these diseases are thought to originate from wild animals^{11, 12}. Their close proximity to people and the poor conditions in which they are kept, create the ideal situation for pathogens such as viruses to mutate, and subsequently spillover to humans¹³. Wild animals such as bats, civets and primates have been documented to host deadly zoonotic pathogens^{14 15 16}. These types of animals are well known to have played a role in the transmission of previous zoonotic pandemics like Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and Ebola virus¹⁷. But shockingly, our investigations revealed they were still available for sale and export. Moreover, Covid-19 is recognised to have originated from wild animals, with the commercial exploitation of wildlife suspected of playing a role in its transmission¹⁸. This emphasises why the demand for wildlife and wildlife products is a primary cause of the emergence and spread of infectious zoonotic diseases. The only way to properly reduce the threat of future global pandemics is by ending wildlife trade.

Legality

Legal and illegal trade of wild animals is not always easily distinguishable due to the close complex relationship between the two systems¹⁹. For example, wildlife trade can be legal, illegal, or a combination of both, depending on how a species is classified as it moves through different countries²⁰. This investigation found only a few of the species being traded via the two Facebook accounts in Togo were currently regulated by The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which aims to ensure the international trade of wild animals and plants does not threaten the survival of species. And of those, it's possible some shipments were made without the required permits or did not properly adhere to export quotas. For the species we found in social media adverts that are not protected under CITES, this does not mean the trade is not a conservation concern now or in the future.

International Air Transport Association (IATA) standards only come in to play once the animals are loaded onto the aircraft, and essentially aim for the animals to 'survive' rather than 'thrive' during the transport process. However, images from this research showed negligence by Ethiopian Airlines. For example, where tortoises were packed in restricted spaces that prevented the animals from fully extending their head and neck during the journey. Biosecurity measures vary between countries and airports, presenting varying public health risks associated with the trade of wild animals²¹. Therefore, legal trade does not guarantee species conservation, proper animal welfare or public health.

It's time to act. Ethiopian Airlines can become a wildlife-friendly corporate

We believe this cruelty is just the tip of the iceberg and exposes a fraction of the true scale of wildlife trade. But every effort to stem this injustice to wild animals and to safeguard human lives from zoonotic diseases matters. Turkish Airlines and Turkish Cargo ceased shipping African grey parrots from Africa from 2019²². Now we are asking Ethiopian Airlines to demonstrate leadership to other aviation industry players in Africa and globally, by stopping the commercial shipping of wildlife from Africa. Wildlife is Africa's pride and that must be protected. We must commit to ending global commercial wildlife trade in all its forms - luxury pets, entertainment, traditional medicine and fashion.

Introduction

The global trade of wild animals is a multi-billion dollar business, with illegal trade making up a significant proportion of it (up to US\$20 billion annually²³). This trade, which increasingly takes place over social media, is considered one of the leading causes of global accelerating ecosystem collapse and biodiversity loss. This not only has negative consequences for the wellbeing of humans, but it could be devastating for species conservation. A global assessment report on biodiversity by the Intergovernmental Science-Policy platform on Biodiversity and Ecosystem Services (IPBES)²⁴ warned that nature is declining at unprecedented rates. It said the extent of extinction threat facing wildlife in particular – due to direct human exploitation, such as harvesting animals for trade – is accelerating for many species groups.

Africa is privileged to be home to some of the world's most iconic wild animals such as lions, elephants, rhinos, cheetahs and buffalo, as well as many other sentient species. They all play a critical role in maintaining ecosystems. Every year, huge numbers of wild animals are cruelly captured in the wild or born into captivity to meet the demand for keeping live wild animals as pets or for animal products. A recent report by World Animal Protection²⁵ highlighted some of the top traded wildlife species from Africa. It revealed that more than 1.5 million live animals were legally exported from Africa between 2011 and 2015 (according to The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) data). A substantial number of these were to supply the booming 'exotic pet' trade. But 'exotic pets', including birds, reptiles and many mammals that have not been domesticated, are still wild animals.

This investigative research report highlights how Facebook and the aviation industry are fuelling wildlife trade from Africa amid the Covid-19 pandemic. Covid-19 is recognised to have originated

from wildlife^{26 27 28}, with the commercial exploitation of wildlife (involving the sale and slaughter of live wild animals and their body parts) suspected of playing a key role in its origin and transmission. Covid-19 has caused dramatic loss of human life – more than 4 million deaths worldwide to date²⁹ – an unprecedented challenge to public health, and an intense existential threat to livelihoods. More than 70% of zoonotic emerging infectious diseases are thought to originate from wild animals³⁰, with poor welfare conditions and proximity to people creating the ideal situation for viruses to mutate and spillover to humans.³¹

To reduce the risk of future pandemics, we must put a stop to the commercial wildlife trade. Society needs to seriously rethink how we view and treat wild animals and shift to alternative livelihoods that don't exploit them. Recent interim guidance³² from the World Health Organisation (WHO), the World Organisation for Animal Health (OIE) and the United Nations Environment Programme (UNEP), called on national authorities around the globe to suspend live wild mammal sales in traditional food markets as an emergency measure to help prevent future pandemics. As airlines are helping deliver Covid-19 vaccines to all corners of the world including Africa, they must stop shipping high-risk wild animal species known to harbour dangerous pathogens for commercial purposes.

In the face of this new evidence, we are asking the aviation industry to:

- help protect millions of wild animals from extinction and suffering in the wildlife trade
- to keep wild animals in the wild where they belong, and
- protect their habitat.



Photo: The Common Cusimanse (*Crossarchus obscurus*) is one species of mammal advertised as available for sale and export from snake farms in Togo.



Photo: Togo, together with neighbouring Ghana and Benin, is a major source and exporter of reptiles. Some species are captive bred or ranched in Togo but there are questions regarding acquisition of breeding stock and dependence on wild-sourced animals.

Research methods

Data collection focused on social media users known to be involved in the trade of wildlife in Togo, West Africa. The two Facebook accounts, associated with a number of registered snake farms in the region, were openly advertising wildlife for sale online and facilitating the movement of wildlife from the farms to the airport for international export. Text, images and videos from all unique Facebook posts (dated 2016–2020) related to trade activity provided data about the type of animals traded (taxonomic class, species), volume of trade, holding and shipping conditions, and the source, destination, and route taken. Images and footage in the posts related to two main types: those taken at the wildlife ‘snake farms’ and those taken at the airport, providing a unique view into the operation.

Where posts showed wild animals in holding containers or packaged for shipping, the number of individual animals in each container was estimated. For those showing only the shipping crates, the number of crates was recorded along with the taxonomic class of the animals as marked on the shipping label. Posts that identified cargo tracking codes provided additional data on the destinations, transit points, dates, and airlines involved. Where possible, this data was cross-referenced with publicly available databases of shipment records to confirm trades, airline, date and route. Where Airway Bill numbers (or shipping labels) were visible in the posts, they were tracked via online air cargo tracking systems³³ to obtain details of the route taken, weight and volume of cargo.

All vertebrate wild animals shown in the posts’ images and footage were identified to the lowest taxonomic level, and to species level where possible. Data was assessed to identify the conservation status, population trend, geographical distribution and habitat preference of the species identified, and whether they were traded under the protection of CITES³⁴, which seeks to protect wildlife threatened by trade.

To assess the geographical distribution of the animals, species were classified as having a ‘restricted’ (i.e. regional), ‘widespread’, or ‘exotic’ distribution (i.e. not found on the African continent). Data was further assessed to determine whether the wild animals traded were likely sourced from Togo or another country.

Posts containing photos of vertebrates in holding and shipping containers were also evaluated for welfare conditions based on provision of space, shelter, water, and substrate (bedding), as well as hygiene levels.

This investigation into two Facebook accounts provides a unique insight into the legal trade of wildlife from West Africa. It is also backed up by further investigations and research into snake farms in Togo, Benin and Ghana^{35 36 37}. But these findings are only the tip of the iceberg, the true scale of the wildlife trade originating from this wildlife trade hub is likely much bigger³⁸.

Findings - West Africa as a trade hub

This investigation provides the most detailed insight to date into the diversity and global extent of wildlife trade activity from a recognised trade hub and major exporter in West Africa. It lifts the lid on a largely unregulated wildlife trade and reveals that snake farms in West Africa do much more than feed international demand for Ball pythons as pets. They also act as wider trade hubs, exporting a vast diversity of other live wildlife, transported in inhumane conditions to destinations around the world where they are used merely as luxury pets.

The scale of the trade and species involved is huge. At least 200 different wild animals, including 187 vertebrates, were featured in the 911 Facebook posts of the two wildlife traders in Togo, with 165 vertebrates identified to species level. All of these animals were advertised as available for sale or export from West Africa between 2016 and 2020. Beyond snakes, our findings show that a wide range of species are caught up in this trade, from parrots and primates, to lizards, snakes and tortoises. It also stretches to include many other charismatic species such as the Demidoff's dwarf galago, tanzania monkey, African reed frog, and Northern white-faced owl, as well as invertebrates such as scorpions, millipedes and tarantulas. Our evidence shows considerable diversity within each class of animal identified, particularly for birds and mammals, and that even high risk animals known to have the potential to spread disease are being traded. These included bats, small carnivores, primates, rodents, parrots, cranes, kites, and turacos. The majority of this trade depends predominantly on native wildlife; only three of the identified species are not native to Africa and an additional 18 species that are present in Africa are either non-native species or are considered scarce or extinct in the wild in Togo.

The vast majority of species identified in the posts were reptiles, which featured in more than 70% of pre-shipment posts and more than 90% of shipping posts. At least 102 different reptiles were identified, including many charismatic species restricted to West African forest habitats, such as the sawtail lizard and the West African gaboon viper. The posts also included several species that are subject to regular international demand as exotic pets, such as the fat-tail gecko and Togo fire skink. It was clear that a substantial proportion of the species identified were taken directly from the wild, with some reptile species, such as pythons and Savannah monitor lizards 'ranching' at the farms in Togo, and others, such as the African spurred tortoise, captive-bred.



911 Facebook posts

featured at least

200 different wild animals

(including 187 vertebrates)



advertised as available
for sale or export
from West Africa

between 2016 - 2020

Table 1: Diversity of species advertised for sale by the two wildlife social media profiles in Togo, 2016-2020

Taxonomic Group	Number of different species	% of Species	% of the 911 Facebook posts
Birds	25	13	2
Mammals	36	18	7
Reptiles	102	51	52
Amphibians	24	12	3
Invertebrates	13	7	8

Photo: The greyish eagle-owl (*Bubo c.f. cinerascens*) is one of over 20 different bird species identified as available for sale from the snake farms in Togo.



More than 7% of the species identified in the social media posts are classified as either Vulnerable, Endangered or Critically Endangered according to the IUCN Red List of Threatened Species (IUCN, 2020), demonstrating that species formally recognised as being threatened by extinction are also caught up in this trade. This trade is however largely unregulated under CITES; the evidence shows that three quarters of the vertebrate species identified are not listed in CITES appendices. More than half (54.5%) of the vertebrate species identified in the posts are classified as Least Concern by the IUCN. However, almost half (44%) of the mammals and three quarters of the amphibians classified as Least Concern have unknown or declining population trends in the wild, and for 80% of the 21 identified reptile species classified as Least Concern, their population trend is unknown.

More than 7% of the species identified in the social media posts are classified as either Vulnerable, Endangered or Critically Endangered according to the IUCN Red List of Threatened Species (IUCN, 2020)

Table 2: Conservation status of vertebrates advertised for sale by the two wildlife social media profiles in Togo, 2016-2020






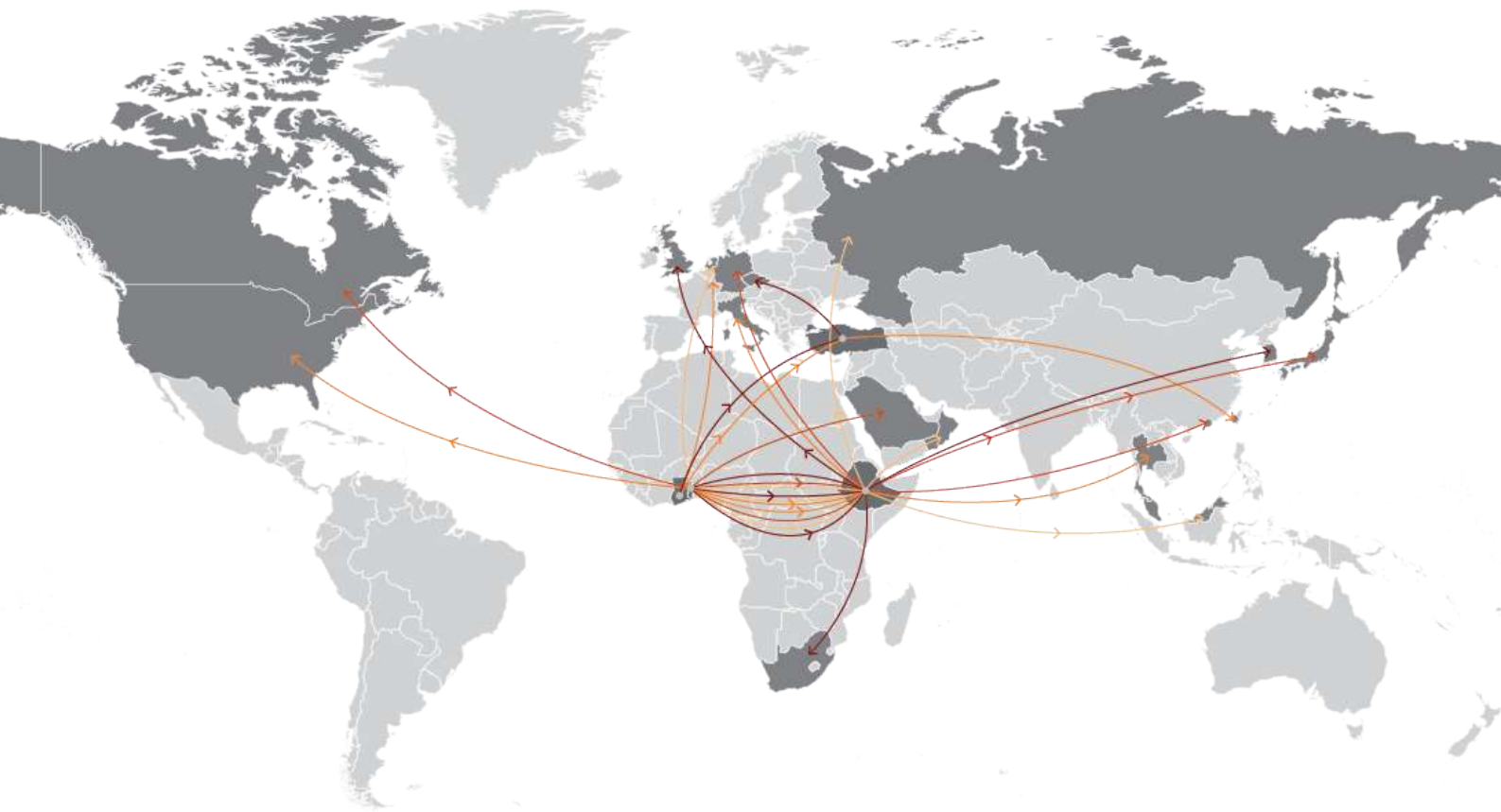
	IUCN Red List classification	Number of species	% of species
	Least Concern	84	55
	Not Evaluated	53	34
	Vulnerable	8	5
	Endangered	1	1
	Critically Endangered	2	1

Table 3: CITES status of vertebrates advertised for sale by the two wildlife social media profiles in Togo, 2016-2020

CITES Status	Number of species	% of species
Appendix I	1	<1
Appendix II	31	20
Appendix III	2	1
Not Listed (NL)	124	79

Photo: African spurred tortoises and hinge-back (Kinixys) tortoises packaged for export from West Africa.





The advertised wild animals observed in the social media posts were being shipped up to nine times per month to at least 18 countries in North America (US and Canada), Europe (UK, Italy, Russia, Germany, Czech Republic, Netherlands and Luxembourg), Asia (Thailand, Japan, South Korea, Hong Kong, Taiwan, Malaysia, Oman and Saudi Arabia), and elsewhere in Africa (South Africa). Shipments were made using at least 13 unique trade routes and a number of major airlines, including Ethiopian Airlines, Turkish Cargo, Royal Air Maroc (Moroccan airline), Delta Airlines, Lufthansa Cargo, and Air France-KLM. Some shipments, such as those involving fire skinks, centipedes, tarantulas, African rock pythons, and savannah monitor lizards, contained hundreds and possibly several thousand individual animals.

Table 4: Trade routes and international destinations for exotic pets advertised for sale by the two wildlife social media profiles in Togo, 2016-2020 ►

Exporter	Via/Transit	Importer
Togo	Ethiopia	Thailand
Togo	Ethiopia	UK
Togo	Ethiopia	Japan
Togo	Ethiopia	Italy
Togo	Ethiopia	Russia
Togo	Ethiopia	South Korea
Togo	Ethiopia	Hong Kong
Ghana	Turkey	Taiwan
Togo	Ethiopia	Oman
Ghana	Turkey	Czech Republic
Togo	Ethiopia	Germany
Togo	Ethiopia	South Africa
Togo	Ethiopia	Malaysia
Togo	n/a	US
Togo	n/a	Canada
Togo	n/a	Netherlands
Togo	n/a	Saudi Arabia
Togo	n/a	Luxembourg

Spotlight on Ethiopian Airlines

Business growth and ambitions

Ethiopian Airlines (Ethiopian), is a very well-connected airline that currently represents the largest aviation group on the African continent³⁹. It has a fleet of 128 aircraft and serves 127 destinations on five continents. A wholly government-owned airline, it has its main hub in Addis Ababa, and other hubs located in Togo, Malawi, Mozambique and Chad. Lomé in Togo, and Lilongwe in Malawi, act as its second and third hubs, respectively.⁴⁰

2019 saw the airline generate just over US\$3.9 billion in revenue, with a gross profit of US\$260 million⁴¹. Two significant sources of this solid financial performance are the number of passengers and freight transported in recent years. Passenger numbers quadrupled over a 10-year period from 2009/2010, transporting more than 12 million passengers in 2019⁴², and 459,000 tonnes of freight in 2019 (more tonnage than the next 10 African airlines combined)⁴³. Ethiopian was ranked 7th in the world by the Centre for Aviation (CAPA) for cargo payload in the week commencing 11 January 2021. This rise up the ranks was most likely due to “their response to the pandemic”⁴⁴, as Ethiopian was one of the first airlines to modify passenger planes so they could carry cargo instead of people during the pandemic.⁴⁵

Ethiopian is considered a rare success story among its African aviation peers. Guided by its 15-year strategic plan entitled Vision 2025, and its mission “to become the most competitive and leading aviation group in Africa”, it has also become the most profitable aviation group in Africa⁴⁶. In Ethiopian’s next 15-year plan, Vision 2035, Ethiopian Cargo and Logistics Services aims to be one of the top 20 cargo airlines, increasing its sub-Saharan African cargo market share to 30%, with an annual revenue target of \$2.97 billion.⁴⁷ **However, at the same time, by exporting live wild animals, Ethiopian could be increasing the risk of the next global pandemic by transporting dangerous pathogens as well.**

In line with its dedication to ambitious growth and operational excellence, Ethiopian also has clearly stated aims to be a responsible social actor. Its environmental policy commits the aviation group to “protect the environment by addressing adverse environmental impacts, sustainable resource management, emergency preparedness, and environmental risk reduction”⁴⁸. Ethiopian joined the effort to address the global pandemic through the designation of its primary Addis Ababa hub as a ‘Humanitarian Air Hub’, a United Nations initiative “to scale up procurement and distribution of protective equipment and medical supplies”. Aided by Ethiopian Cargo’s Pharma Wing – a state-of-the-art temperature-controlled pharma and medical supplies handling storage area – it has also been “delivering lifesaving Covid-19 medical supplies” donated by the Jack Ma Foundation.⁴⁹

This research report identified a large number of consignments of reptiles and mammals carried by Ethiopian Airlines. Continued transport of these animals runs the risk of counteracting the great work it has done distributing vaccines and medical supplies, as live wild animal transport facilitates the spread of dangerous pathogens. The commercial transportation of these animals, who belong in the wild and suffer as result of their displacement, further compounds their suffering as they are packed into containers.

Ethiopian Airlines is a source of great national pride in Ethiopia, with its foundation anchored in the early days of the post-WWII period of rapid modernisation. Its ambitions to become one of the premier aviation groups in the world, both financially and as leaders in corporate social responsibility, is clear. Its rise to the top of the aviation industry in Africa is evidence of that. However, as Ethiopian realises its ambitions and connects Africa and the world, it must ensure it does not jeopardise those connections and its environmental obligations. In fact, its unique role and success on the African continent provides the opportunity to fulfil its social obligations and act to safeguard the world against pandemics, while protecting African wildlife.

As Ethiopian Airlines realises its ambitions and connects Africa and the world, it must ensure it does not jeopardise those connections and its environmental obligations.

Findings - Ethiopian Airlines evidence

It is not possible to determine the full extent of wild animal species transported by Ethiopian Airlines from the social media posts examined during this investigation. However, the available evidence confirms that:

- Reptiles featured in at least 30 of Ethiopian Airlines' shipments (containing 147 pieces of cargo), mammals featured in at least four, invertebrates in four and amphibians in one.
- At least 25 different animals were involved in Ethiopian Airlines shipments; 22 were identified to species level and a further three were identified to genus level.

- The most frequently shipped species via Ethiopian Airlines were rough-scaled plated lizards (4 shipments), African spurred tortoises (3 shipments), green bush vipers (2 shipments), Pardine genets (2 shipments), savannah monitor lizards (2 shipments), Senegal chameleons (2 shipments), and tailless whip scorpions (2 shipments).

In fact, Ethiopian Airlines was the most frequently identified airline involved in transporting wild animals (following a systematic review of all the 911 social media posts between 2016 and 2020). Overall, their involvement was confirmed in 39 separate Facebook posts from which 33 unique Airway Bill numbers were visible. This provides evidence that 33 shipments carrying wild animals were exported via Ethiopian Airlines to at least 10 different countries worldwide including Japan, South Korea, Thailand, Hong Kong, Oman, Malaysia, Germany, Italy, Russia, and the UK.

Image: Credit: byeangel



Table 5: List of species advertised for sale by the two wildlife social media profiles in Togo 2016-2020, that relate to 33 shipments involving Ethiopian Airlines.

Species identified on Ethiopian Airlines cargo	Number of shipments	% of shipments
 African civet (<i>Civettictis civetta</i>)	1	3
 African house snake (<i>Lamprophis fuliginosus</i>)	1	3
 African spurred tortoise (<i>Centrochelys [Geochelone] sulcata</i>)	3	9
 Agama lizard (<i>Agama</i> sp.)	1	3
 Baboon spider (<i>Heteroscodra</i> sp.)	1	3
 Ball python (<i>Python regius</i>)	1	3
 Brooke's gecko (<i>Hemidactylus brookii</i>)	1	3
 Bush babies (<i>Galagidae</i> sp.)	1	3
 Common agama (<i>Agama agama</i>)	1	3
 Diadem snake (<i>Spalerosophis diadema</i>)	1	3
 Fat-tail gecko (<i>Hemitheconyx caudicinctus</i>)	1	3
 Five-lined skink (<i>Trachylepis quinquetaeniata</i>)	1	3
 Green bush viper (<i>Atheris chlorechis</i>)	2	6
 Forest hinge-back tortoise (<i>Kinixys erosa</i>)	1	3
 Marsh mongoose (<i>Atilax paludinosus</i>)	1	3
 Pardine genet (<i>Genetta pardina</i>)	2	6
 Peter's banded skink (<i>Scincopus fasciatus</i>)	1	3
 Puff adder (<i>Bitis arietans</i>)	1	3
 Rhinoceros viper (<i>Bitis nasicornis</i>)	1	3
 Rough-scaled plated lizard (<i>Gerrhosaurus major</i>)	4	12
 Savannah monitor lizard (<i>Varanus exanthematicus</i>)	2	6
 Senegal chameleon (<i>Chamaeleo senegalensis</i>)	2	6
 Tailless whip scorpion (<i>Damon diadema</i>)	2	6
 Togo fire skinks (<i>Mochlus fernandi</i>)	1	3
 West African mud turtle (<i>Pelusios castaneus</i>)	1	3

Table 6: Trade routes and international destinations for exotic pets advertised for sale by the two wildlife social media profiles in Togo 2016-2020, that relate to 33 shipments involving Ethiopian Airlines.

Exporter	Via/Transit	Importer	Number of Shipments
Togo	Ethiopia	Thailand	3
Togo	Ethiopia	Germany	1
Togo	Ethiopia	Hong Kong	2
Togo	Ethiopia	South Africa	1
Togo	Ethiopia	Malaysia	1
Togo	Ethiopia	London	1
Togo	Ethiopia	Russia	2
Togo	Ethiopia	Oman	1
Togo	Ethiopia	Italy	1
Togo	Ethiopia	South Korea	5
Togo	Ethiopia	Japan	15

Welfare concerns

It is widely accepted that vertebrate wild animals (i.e. amphibians, birds, fish, reptiles, and mammals), as well as many invertebrates are sentient^{50,51}. Sentience refers to the 'inner life' of an animal, and a sentient animal has capacity to suffer fear, pain or distress as well as a sense of wellbeing. Evidence that wild animals are sentient means their welfare (their psychological and physiological wellbeing in relation to the conditions in which they live) matters. Wild animals have the capacity to experience suffering during every step of a wildlife trade chain including capture, restraint, transport and subsequent captivity, irrespective of a species' legal status⁵². The only way to ensure this chain of suffering ends is to keep animals in the wild so they can lead a life worth living, one free from the physical and mental deprivation that captivity and trade inflicts.

None of the social media posts analysed during this investigation included images showing methods employed to capture animals from the wild. However, previous research has already highlighted animal welfare concerns associated with the wild capture of wildlife to fuel the international exotic pet trade. For example, Ball pythons suffer stress during capture (in most cases physical removal from rodent burrows) and transport (live, in sacks filled with other snakes), where they risk sustaining physical injuries

Photo: Ball pythons (*python regius*) available for sale from a snake farm in Togo. When threatened or stressed, they adopt their defensive posture of coiling into a ball.



– either or both which may result in death or increased susceptibility to disease and/or infection⁵³. The capture of African grey parrots is inherently cruel. Poachers often use injured lure birds tied to tree branches, whose screeching then attracts other African grey parrots to investigate, as they are highly social animals. The branches are painted with a sticky substance which once perched on by a bird, fixes their claws and feet to it.⁵⁴

Wild animals bred or born into captivity fare no better. Animal welfare standards on the snake farms appeared to be particularly poor, with most images shared via the social media posts showing wild animals in barren containers, lacking shelter or water, and often in overcrowded conditions. None of the 207 posts that included images showing animals in their holding (non-shipping) cage or container at snake farms – where the complete cage or container could be seen – showed any enrichment provision. Welfare scores were poor for all factors, but particularly so for shelter and water: none of the cages/containers shown provided any shelter, and 85% (176 of 207) provided no water. Although cages/containers appeared (from photos) to be intermediately hygienic, those occupied by multiple animals (n = 194) lacked appropriate space for individuals. Although morbidity and mortality rates cannot be determined from an analysis of these social media posts, there are severe concerns that these poor captive conditions are tragically resulting in death and disease for the wild animals involved.

Animal welfare at the packing/shipping stage is also of great concern. Images associated with this stage of the wildlife trade chain show wild animals packed into sacks and placed in crates for transport. In some cases they are packed tightly with multiple other wild animals, in a manner that can cause physical injuries and limit the space available to stretch out and perform their natural behaviours.

Even those that survive the process of capture from the wild, storage and transport, what awaits them is a lifetime of captivity and compromised welfare as exotic pets. Ball pythons typically end up either as breeding stock in small restrictive tubs or boxes in shelving units called 'rack' systems, or are kept as pets in homes of owners who are not fully aware of their welfare needs. These conditions don't allow them to fully extend their bodies, and may be lacking appropriate provisions of water, hides, enrichment and floor material.



African grey parrot. The African grey parrot is just one of the 25 identified bird species advertised as available for sale from the two social media profiles in Togo. In the wild, African grey parrots are patchily distributed across a number of countries in west, central and eastern Africa, but the species is considered at very low numbers or extinct in Togo⁵⁵. They commonly inhabit dense forests and are usually found in wooded savannah, gallery forests, mangroves, cultivated areas, clearings and forest edges, where they mainly feed on seeds and fruits and build their nests in tree cavities⁵⁶. They are a highly social species who live in flocks of hundreds of individuals⁵⁷ and are considered to have the cognitive abilities of a three-year-old human child.

Holding these birds - which travel great distances in the wild - in small captive enclosures is inherently cruel. It can have severe impacts on their mental wellbeing and physical health. In captivity, they have been observed to exhibit behaviours such as feather plucking, signs of stress, boredom, and the inability to engage in instinctive activities such as flying vast distances with other parrots⁵⁸. Because of the physiological stress incurred, data focused on some trade routes have estimated that 40-60% of African grey parrots captured from the wild will die before they even reach a market^{59 60}.



Bushbabies. Bushbabies (Demidoff's dwarf galago) are just one of at least six species of primates that were frequently available for sale and export from the two social media accounts in Togo, and were also identified as exported via Ethiopian Airlines cargo. Bushbabies are arboreal and nocturnal primates found in both tropical and sub-tropical forests across sub-Saharan Africa. They are omnivorous and subsist on insects, small animals, fruit and tree gum. Although solitary foragers at night, they spend the day in family groups of two to seven, and depending on the species, either in tree hollows or vegetation⁶². They move around by leaping among trees, easily covering 9m distances in a matter of seconds.

Because bushbabies live in rich environments and in social structures in the wild, it is highly unlikely that these primates will be able to engage in natural behaviour in captivity due to insufficient enrichment, space, companionship and mental stimulation. As a primate that lives in social groups, being kept as a pet in solitary captivity can lead to social isolation and depression.⁶²



Patas monkey. The patas monkey is one of at least six primate species identified as available for sale from the two social media accounts in Togo. They are a diurnal primate species that is largely terrestrial but climbs trees when threatened. They are omnivorous, feeding on a complex diet of plants, insects and tree gum. In the wild, they live in varied habitats such as forests, savannas, and shrub/grassland, and their home range can be up to 50km² ⁶³. Although they spend mornings and afternoons engaging in social activities such as grooming, they tend to sleep alone, one individual to a tree.

They are intelligent, social wild animals with complicated welfare needs that cannot be fully met in a captive environment⁶⁴. The physiological stress resulting from capture, transport and confinement in captivity can lead to serious animal welfare outcomes such as weight loss, changes to the immune system and decreased reproductive capacity.⁶⁵



African pygmy hedgehog. The African pygmy hedgehog was one of at least 36 mammal species identified as available for sale and export from the two social media profiles in Togo. African pygmy hedgehogs are nocturnal and solitary mammals that have become a popular pet in many countries of the world. In the wild, they are found in equatorial Africa in a range of savannah and semi-arid habitats and are the most widespread of the African hedgehogs⁶⁶. They are also the smallest of the African hedgehogs, weighing approximately 335g and measuring 210mm in length. They are omnivorous, primarily feeding on a range of invertebrates such as ants and beetles, and fruits and fungi⁶⁷.

As solitary and nocturnal animals, being housed in captivity with other individuals can create stress and make them susceptible to a range of diseases, such as heart disease, wobbly hedgehog syndrome and tumours⁶⁸. Captivity also increases the hedgehog's risk of contracting dermatitis from urine or fecal contamination⁶⁹.



Genet. Genets are becoming increasingly popular as exotic pets internationally and were one of the most frequently posted types of mammal advertised as available for sale from the two social media accounts in Togo. Images of animals in shipping crates provided evidence that pardine genets (and possibly also common genets) were exported via Ethiopian Airlines, with shipments identified to Italy and Japan.

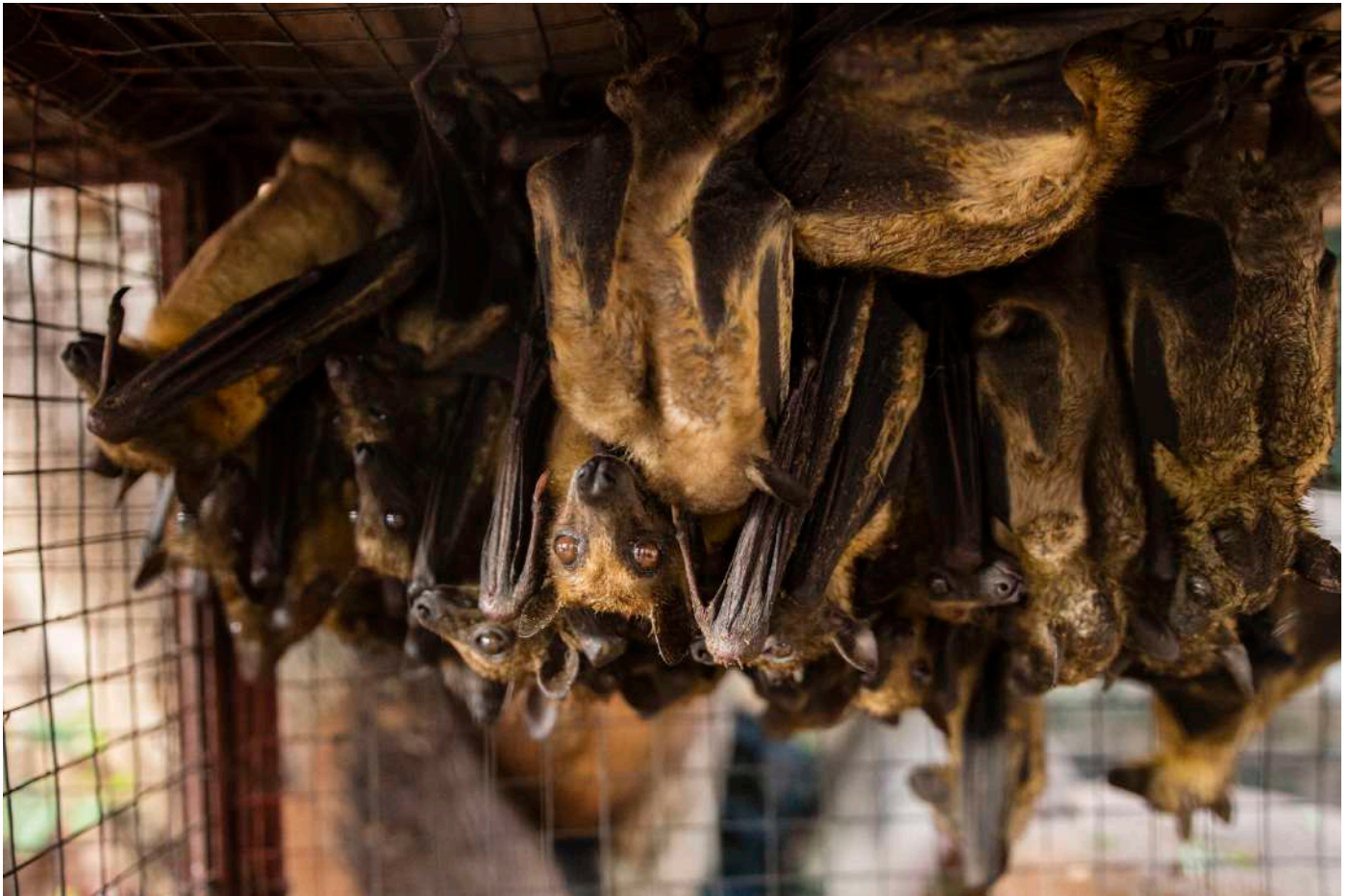
Pardine genets are carnivorous, solitary and nocturnal, tree-climbing mammals. They live in a range of habitats in West Africa, with population ranges from Senegal to Ghana, and have been observed in both Togo and Benin⁷⁰. They are usually found in primary and secondary rainforests, gallery forests and moist woodlands, but are also present in bushlands and forest plantations.

Along with trapping for the international pet trade, they also face local threats, such as hunting for bushmeat markets, however their current population trends in the wild are unknown⁷¹. As solitary, nocturnal and primarily tree-dwelling animals that spend much of the daylight hours resting in the safety of trees, it would be impossible to provide a captive environment as complex and rich as in the wild. Being confined to small enclosures together with other individuals is likely to have negative welfare consequences.



Mongoose. Images of animals in shipping crates provides evidence that Egyptian mongooses were exported from Togo to Italy and Japan via Ethiopian Airlines. On the African continent, Egyptian mongooses inhabit parts of sub-Saharan Africa, with home ranges stretching from Senegal and Gambia to East Africa, and south towards Angola, Zambia, Malawi and Mozambique. They are found in coastal, river and lakeside habitats and avoid extreme deserts and moist forests. They are diurnal and opportunistic omnivores, feeding on small mammals, insects, fish, birds, fruit and fungi.⁷²

There is little information on the social behaviour of the African species. However, they are known to be solitary, but do commonly form family groups of 4-6 individuals. Along with trapping for the international pet market, incidental and deliberate poisoning has been identified as a localised threat for populations on the Iberian Peninsula⁷³. Because very little is known about the behaviour of mongooses in the wild, lack of specialist knowledge of the species and its needs means that they are likely to suffer negative welfare consequences in captivity.



Bat. Images of animals in holding and transportation containers provides evidence that at least two species of bats were available for sale and export from the social media accounts in Togo - the African straw-coloured fruit bat and Egyptian fruit bat. In Africa, there are more than 200 species of bats, accounting for 20% of the world's bat population⁷⁴. The African straw-coloured fruit bat is broadly distributed across the lowland rainforest and savanna zones of Africa, from Senegal in the west, through to South Africa in the south and Ethiopia in the east⁷⁵. Within Africa, the Egyptian fruit bat is distributed across sub-Saharan Africa and North Africa⁷⁶. Fruit bats are highly sociable animals that form large colonies of thousands to even millions of individuals during the breeding season and exhibit extreme roost-site fidelity. They feed on soft fruits, flowers, and occasionally on flying insects⁷⁷. Fruit bats are unique, nocturnal and migratory mammals with complex needs that vary seasonally in relation to the bat's lifecycle. They need to fly long distances to stay strong, and as they are nocturnal creatures, they need places to hide and hang during daylight hours. As such, it is not possible to fully meet their welfare needs in captivity.



Ball python. The Ball python is a species that was identified as exported via Ethiopian Airlines and was frequently advertised as available for sale from the social media accounts in Togo. In the wild, Ball pythons are distributed widely across Africa and can be found in Sudan, Uganda, and central and west Africa⁷⁸. Being carnivores, they commonly prey on a range of rodents in the wild, feeding by either constricting and immobilising their prey or swallowing them alive. They inhabit grasslands and open forests, as well as agricultural land, largely residing in burrows⁷⁹. Like all reptiles, they have very specific needs with regards to temperature, diet, lighting, and humidity.

Studies have shown that across the trade chain - from capture in the wild to private ownership - they are subjected to poor welfare conditions. For example, they can suffer stress and injury during removal from their burrows⁸⁰. Pre-shipment images repeatedly show pythons densely stocked in containers and in potentially unhygienic conditions, conditions which can result in death and disease⁸¹. Captive snakes show behavioural abnormalities if they are restricted by small enclosures, with implications for a range of welfare issues.



Savannah monitor lizard. Savannah monitor lizards were one of the most frequently posted wild animal advertised as available for sale from the two social media accounts and were also identified as exported in at least two of Ethiopian Airlines' shipments. They are a highly territorial species that live in grassland and savannah habitats in sub-Saharan Africa. The behaviour of savannah monitors is highly seasonal; they feed for only half of the year during the rainy season and starve for the other half. Their diet consists of small mammals, snakes, birds, toads, lizards and eggs, and are most active during the day⁸². Along with trapping for the pet trade, other major threats to wild populations of the savannah monitor lizard include being hunted for food, and use in traditional medicine and the skin trade⁸³.

Pre-shipment images show multiple individuals housed together and with very little space to move around. Due to their territorial nature, placing males in the same enclosure can lead to severe physical harm as they bite each other to defend their territory. In the wild, the lifespan of a Savannah monitor is around 20-30 years⁸⁴. In captivity, this is reduced to around 17 years due to husbandry-related factors.⁸⁵



African spurred tortoise. African spurred tortoises were frequently identified in images showing animals packaged for export and were confirmed as exported via Ethiopian Airlines cargo in at least three shipments. The African spurred tortoise is the second largest terrestrial chelonian in the world, with adult males reaching 830mm in length and weighing over 100kg⁸⁶. Native to sub-Saharan Africa, where it is widely distributed, this species inhabits arid savannahs and scrubland. African spurred tortoises are mostly herbivorous but can also consume carrion. In the wild, intermittent streams are especially essential for their survival in such arid regions. Much of their activity aboveground is limited only to the wet season with the rest of time spent in extended burrows 15m belowground. They are a long-lived species, known to live for over 50 years in captivity and reportedly over 100 years in the wild⁸⁷. The African spurred tortoise was moved up to Endangered status in 2021 on the IUCN Red List, suggesting that the species has and will sustain at least 50-75% decline over three generations (90 years)⁸⁸. Extensive habitat loss, climate change, and the global exotic pet trade have all been cited as reasons for the rapid population decline⁸⁹.

Images show tortoises of various ages are being held in containers that appear to be plastic tubs or buckets at snake farms in Togo, which would make burrowing impossible. This may have severe welfare implications as it could restrict their ability to thermoregulate⁹⁰. As with all reptiles, they have very specific nutritional needs, habitat structure, lighting, heating, humidity and other requirements, which means that they are likely to suffer negative welfare consequences in captivity.



Photo: Some species available for export from snake farms in Togo, such as the Peter's banded skink, are Data Deficient according to the IUCN Red List, meaning that the impact of exploitation for the pet trade on wild populations is unknown.

Conservation concerns

The commercial trade of wildlife, including live trade for use as exotic pets, is now so substantial that it represents one of the most prominent drivers of vertebrate extinction risk globally⁹¹. Wildlife trade also puts entire ecosystems at risk by facilitating the introduction of species to new regions. Here they can compete with (or outcompete) native species for resources and alter ecosystems, contributing to biodiversity loss via pathogen emergence⁹². Confidence in sustainability of the global commercial wildlife trade is undermined by a systemic lack of scientific data on the status of wild populations, effective management, and monitoring^{93 94 95 96}. Furthermore, genetic pollution of wild populations, leading to the eradication of genetically distinct populations, can occur as part of 'sustainable' captive breeding and trading processes if effective management is not in place.⁹⁷

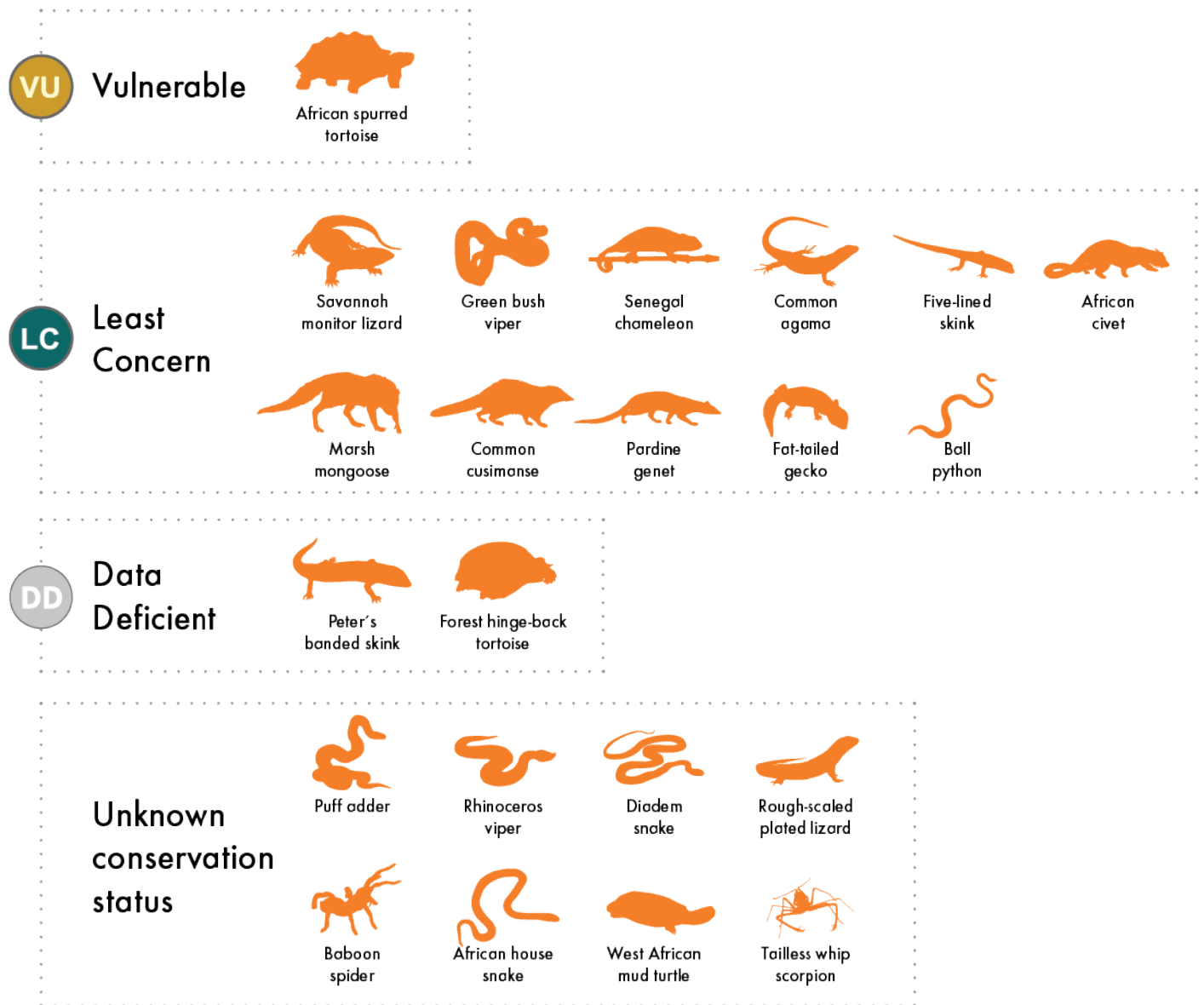
It is clear that species at risk of extinction are caught up in the wildlife trade from the snake farms in West Africa. Of all the vertebrate species identified in the Facebook posts, 11 (7%) are threatened with extinction according to the IUCN Red list. This includes the Critically Endangered hooded vulture, the Endangered Timneh parrot, and eight species classified as Vulnerable: the king cobra, white-throated guenon, Senegal flapshell turtle, Home's hinge-back tortoise, dorcas gazelle,

African softshell turtle, African spurred tortoise, and the black-crowned crane. Some images also appear to show the Critically Endangered Nubian flapshell turtle, a species thought to have largely disappeared from across its range in west and central Africa⁹⁸. Moreover, at least one species, the red-eared slider, is a recognised major risk as an invasive species.⁹⁹

A high proportion of species identified in the social media posts have unknown or declining populations, and the conservation status is unknown for over a third of the species. This suggests a potential impact on native biodiversity and significant uncertainty in terms of sustainable offtake. Even higher levels of uncertainty are associated with the trade in those species that have not been evaluated by the IUCN Red List, given that their conservation status is unknown. Some of the reptiles identified in the posts are 'ranch'd' for export in Togo, such as ball pythons, savannah monitor lizards, hinge-back tortoises, chameleons, and the African softshell turtle, to avoid unsustainable wild offtake. However, there are questions regarding the sustainable acquisition of breeding stock and dependence on wild-sourced animals. Evidence from posts, together with the diversity of species and age classes identified, indicates that a substantial proportion of species identified were taken directly from the wild.

This investigation confirmed that at least one species carried by Ethiopian Airlines is threatened with extinction (the Vulnerable African spurred tortoise), 11 are considered Least Concern (savannah monitor lizard, green bush viper, Senegal chameleon, common agama, five-lined skink, African civet, marsh mongoose, common cusimanse, pardine genet, fat-tailed gecko, ball python), two are Data Deficient (Peter's banded skink and forest hinge-back tortoise), and for eight of the identified species, their conservation status is unknown (puff adder, rhinoceros viper, diadem snake, rough-scaled plated lizard, baboon spider, African

house snake, West African mud turtle, tailless whip scorpion). Some species commonly identified in Ethiopian Airlines cargo include ones that have not been evaluated by the IUCN Red List, such as the rough-scaled plated lizard, which featured in at least four Ethiopian Airlines shipments. All but two of the species identified in Ethiopian Airlines cargo have unknown population trends in the wild. The exception being the five-lined skink with a stable population trend and the Marsh mongoose with a decreasing population trend.^{100 101}



Three species of hinge-back (Kinixys) tortoises were identified in the posts, including the forest hinge-back tortoise, which was also shipped via Ethiopian Airlines. At least 30 individuals could be seen in one image, and mature specimens of both sexes packaged for shipping. Turtles and tortoises are well sought-after as exotic pets internationally. They are also particularly vulnerable to overexploitation due to unfavourable life history traits, such as late maturity and low reproductive output¹⁰². Harvesting of adults in the wild can therefore be especially detrimental.



The ball python was also exported via Ethiopian Airlines and is a popular pet in many countries, particularly in Europe and North America¹⁰³. However, concerns are growing about the conservation impacts and sustainability of this trade from West Africa. For example, the 'ranching' system, once thought to provide a degree of protection for the ball python, has not resulted in any significant conservation benefits¹⁰⁴. Other species identified in the posts are also in high international demand as exotic pets and warrant increased attention from an international trade policy perspective. They include the fat-tail gecko, rough-scaled plated lizard and Togo fire skinks.



Photo: Ball pythons (*python regius*) packed in shipping crates ready for export from Togo.

Of the threatened species identified in the social media posts native to Togo, all were reported to have decreasing populations in the wild. For species already vulnerable to becoming extinct due to local pressures from hunting and habitat loss, such as the white-throated guenon¹⁰⁵, without careful monitoring, even low levels of exploitation for the pet trade could be detrimental to local populations.

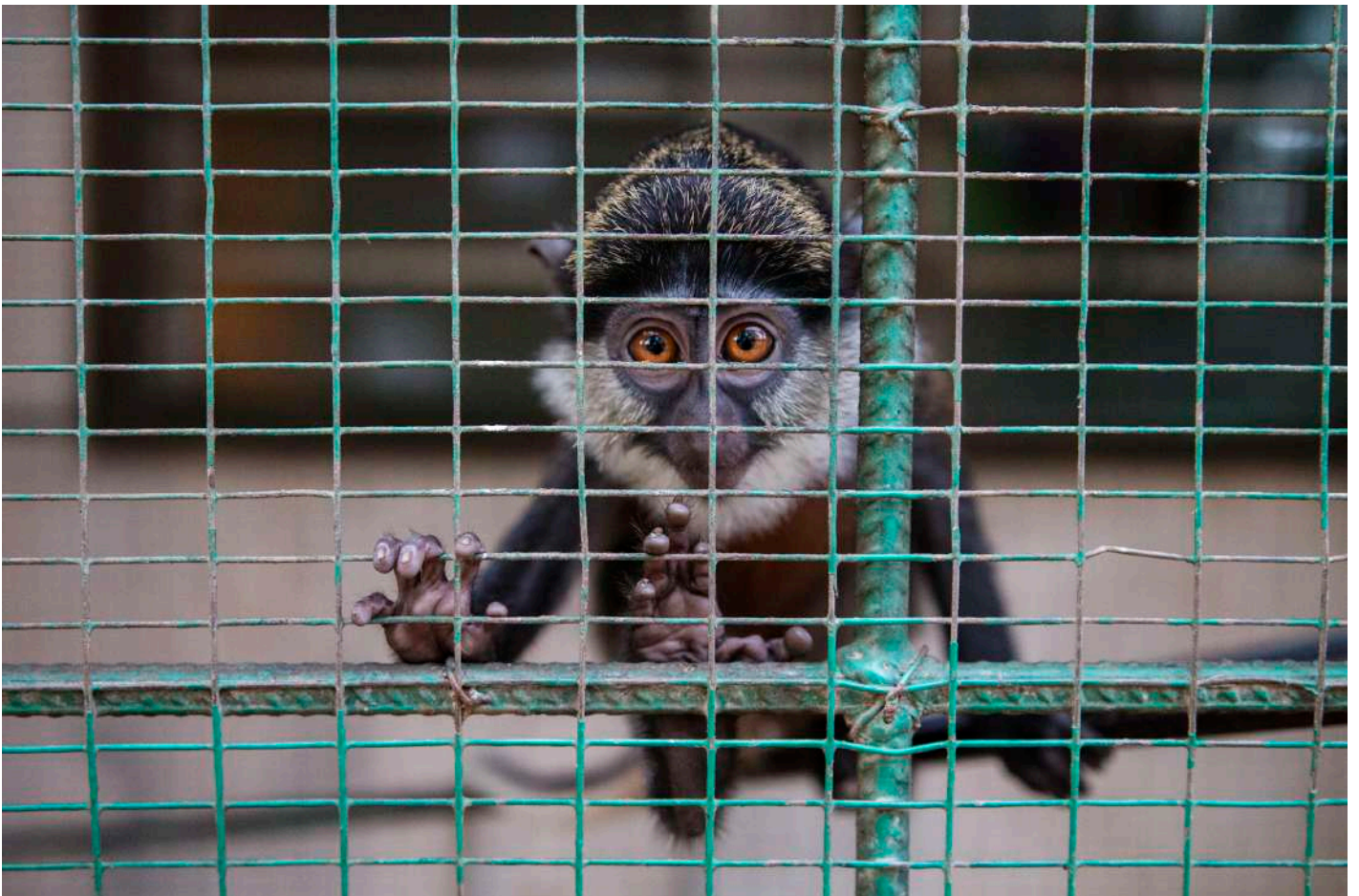


Photo: The white-throated guenon (*Cercopithecus erythrogaster*) is one of several species of primate identified in the social media posts of the two wildlife traders in Togo.

Table 7: Conservation status for threatened exotic pets advertised for sale by the two wildlife social media profiles in Togo 2016-2020. * Identification not confirmed. ** Confirmed as shipped via Ethiopian Airlines.

Species name	Common name	IUCN Red List category	IUCN Population Status
<i>Cyclanorbis elegans</i> *	Nubian flapshell turtle	Critically Endangered	Decreasing
<i>Necrosyrtes monachus</i>	Hooded vulture	Critically Endangered	Decreasing
<i>Psittacus timneh</i>	Timneh parrot	Endangered	Decreasing
<i>Ophiophagus hannah</i>	King cobra	Vulnerable	Decreasing
<i>Cercopithecus erythrogaster</i>	White-throated guenon	Vulnerable*	Decreasing
<i>Cyclanorbis senegalensis</i>	Senegal flapshell turtle	Vulnerable	Decreasing
<i>Kinixys homeana</i>	Home's hinge-back tortoise	Vulnerable	Decreasing
<i>Gazella dorcas</i>	Dorcas gazelle	Vulnerable	Decreasing
<i>Trionyx triunguis</i>	African softshell turtle	Vulnerable	Decreasing
<i>Centrochelys [Geochelone] sulcata</i> **	African spurred tortoise	Vulnerable	Unspecified
<i>Balearica pavonina</i>	Black-crowned crane	Vulnerable	Decreasing

Biosecurity concerns

The international wildlife trade globalises infectious diseases, amplifying the potential consequences of disease outbreaks and presenting a wider threat to more people (and ecosystems and economies) than if they were restricted to localised regions¹⁰⁶. Specifically, wild animal species are thought to be the source of at least 70% of all zoonotic emerging infectious diseases¹⁰⁷, including the highly contagious and deadly novel coronavirus that causes Covid-19¹⁰⁸. Crowded, potentially injured animals, in hot, humid conditions, and in close proximity to other species – like those observed at the snake farms – can create an environment for zoonotic disease emergence and spread¹⁰⁹. Direct human contact with wild animals at these farms is particularly risky due to the large number of new or undocumented pathogens known to exist in certain wild animal populations.¹¹⁰

Evidence from the social media posts examined in this investigation revealed that wild animals known to host pathogens with potential significance for human health were frequently available for sale and export. These include bats, African palm civets, at least six species of primates (bush babies, monkeys and lorises), two species of genets (pardine genet and common genet), and four species of mongoose (marsh mongoose, slender mongoose, common cusimanse and Egyptian mongoose). Some of the species identified in the posts, like bats, civets and primates, are of heightened public health risk when considering their role in the transmission of previous zoonotic epidemics globally, including severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and Ebola^{111 112}. Covid-19 has shone a spotlight on how easily deadly diseases can be transferred to humans from wild animals that have been subjected to the cruelty of the wildlife trade.

This investigation revealed that airlines transported at least four shipments of mammals of particularly high biosecurity concern, including primates, genets, civets and mongooses. The evidence shows that Ethiopian Airlines transported:

- a shipment of “4 pieces of cargo” weighing 43kg from Togo to Italy in September 2018, containing reptiles along with African civets, Pardine genets and Marsh mongooses
- a shipment containing Pardine genets was exported from Togo to South Korea in March 2018, with “4 pieces of cargo” at a weight of 56kg

- a shipment carrying another species of mongoose (Common Cusimanse; at least 8 animals visible) along with reptiles in “8 pieces of cargo” at a weight of 149kg was exported to Thailand in November 2018
- a shipment carrying primates (bush babies, Galagidae sp; around 20 individuals visible) and reptiles was transported from Togo to Malaysia in June 2017 in a “cargo of 3 pieces” at a weight of 42kg.

Reptiles, which featured in more than 90% of shipping posts – including at least 30 shipments carried by Ethiopian Airlines, are also well documented as potential carriers of diseases that affect human health, such as Q fever and Lyme disease¹¹³.

Although some biosecurity measures are present at airports, they are virtually non-existent at the snake farms themselves, and it is questionable whether any veterinary checks made at the airport alone are sufficient to prevent future disease outbreaks and pandemics. Generally there is a lack of surveillance of wildlife entering a country for key animal diseases in most countries¹¹⁴, and minimal health monitoring systems exist surrounding the trade of some wild animals, heightening the potential risk for cross-boundary disease movement.¹¹⁵

Since the start of the Covid-19 pandemic, airlines have played a vital role in keeping supply chains of essential medicines, medical equipment and vaccines functioning around the globe. Their part in fighting the pandemic should not be contradicted by their potential role in causing future zoonotic disease spillovers. To fully eradicate the risk of transmission and emergence of zoonotic diseases from animals to humans associated with wildlife trade, we must stop the international movement of wild animals for commercial purposes.

To fully eradicate the risk of transmission and emergence of zoonotic diseases from animals to humans associated with wildlife trade, we must stop the international movement of wild animals for commercial purposes.



Above: Mongooses and genets in holding containers at a snake farm in Togo.

Right: African civets (*Civettictis civetta*) were frequently advertised as available for sale from snake farms in Togo.

Small mammals

Several mammal species identified in the Facebook images and footage highlight the potential zoonotic disease risks associated with this trade in West Africa. Small carnivores such as genets and civets can act as hosts for several pathogens including 11 viruses that have potential significance for human and animal health¹¹⁶. Genets are becoming increasingly popular as pets worldwide¹¹⁷¹¹⁸, as are civets, despite their association with the 2003-2004 outbreak of SARS-CoV¹¹⁹ which caused 774 deaths in China, Hong Kong, Taiwan, Singapore and Canada.¹²⁰





Above: A fruit bat in holding facilities at a snake farm in Togo, West Africa.

Right: Bush babies (*Galagidae* sp.) were one of a number of primate species identified as available for sale and export from snake farms in West Africa.

Bats and primates

The Ebola virus epidemics in West and Central Africa are also thought to have originated from bats, with primates and other wild mammals believed to be intermediate hosts through which people were infected¹²¹. Bats are also natural hosts of the ancestor of the SARS-CoV-2 virus, which caused the emergence of Covid-19 in 2019¹²². Continued human contact with wild animals also threatens their health as infectious diseases such as Covid-19 can become a reverse zoonosis to wildlife¹²³. This can undermine conservation efforts if viruses are introduced to susceptible endangered animal populations.¹²⁴





Above: West African mud turtles (*Pelusios castaneus*) advertised for sale from a snake farm in Togo.

Right: Sand boas (*Eryx muelleri*) in holding containers at a snake farm in Togo.

Reptiles

The inadequate biosecurity protocols evident at the snake farms in Togo, where captive reptiles are housed in overcrowded enclosures, in rooms with a range of other species, are a particular concern for the transmission of zoonotic diseases such as reptile-borne *Salmonella*¹²⁵. Samples collected at one snake farm in West Africa showed that all but one of the 20 samples analysed contained at least one type of bacterium of potential zoonotic concern¹²⁶. Evidence from images and footage taken at the snake farms in West Africa also raises serious questions about biosafety and the potential risks of this trade to both human and animal health.





Above: Northern white-faced owls (*Prilopsis leucotis*) in holding facilities at a snake farm in Togo.

Right: A lizard buzzard (*Kaupifalco monogrammicus*) and barn owl (*Tyto alba*) in holding facilities at a snake farm in Togo.

Birds

Traded birds can also be a reservoir for diseases that can threaten human health, such as psittacosis, a zoonotic respiratory infection that causes severe pneumonia in humans with a fatality rate of up to 10-15%¹²⁷. Other bird-associated disease outbreaks in humans resulting from the keeping of captive birds as pets, such as histoplasmosis, Q fever, allergic alveolitis, salmonellosis, campylobacteriosis and giardiasis, remain a major public health risk.¹²⁸





Above: Chameleons were among the most frequently identified species in shipments exported from the snake farms in Togo.

Right: African reed frogs (*Hyperolius* spp.) packaged for export from a snake farm in Togo.

Amphibians

Amphibians can also act as vectors for zoonotic disease transfer. For example, they have been known to cause human cases of infection with *Aeromonas* spp., *Mycobacterium marinum*, and *Salmonella* spp.¹²⁹



Table 9: Some of the potential biosecurity concerns associated with exotic pets advertised for sale by the two wildlife social media profiles in Togo 2016-2020

Wildlife class	Example wildlife species	Potential pathogens / Diseases of concern
Amphibian	Savanna banana frog (<i>Afrivalus vittiger</i>), dotted reed frog (<i>Hyperolius guttulatus</i>), Senegal land frog (<i>Kassina senegalensis</i>)	Campylobacteriosis; Endemic relapsing fever; Gastroenteritis; Mycobacteriosis/Tuberculosis; Salmonellosis; Streptococcosis; Yersiniosis; Vibriosis; Leptospirosis; Hepatitis-A; Western Encephalitis; West Nile virus; Coccidiomycosis; Cryptococcosis; Septicaemia
Bird	Timneh parrot (<i>Psittacus cf. timneh</i>), Senegal parrot (<i>Poicephalus senegalus</i>), red-headed lovebird (<i>Agapornis pullarius</i>), rose-ringed parakeet (<i>Psittacula krameri</i>), black crowned crane (<i>Balearica pavonina</i>), green turaco (<i>Tauraco persa</i>), Northern white-faced owl (<i>Ptilopsis leucotis</i>)	Campylobacteriosis; Gastroenteritis; Mycobacteriosis/Tuberculosis; Salmonellosis; Yersiniosis; Septicaemia/general infection; Pneumonia; Dermatitis; Psittacosis; Q-fever; Vibriosis; Leptospirosis; Western encephalitis; Avian influenza; Newcastle disease; Cryptococcosis; Septicaemia; Histoplasmosis
Mammal	Egyptian mongoose (<i>Herpestes ichneumon</i>), African palm civet (<i>Nandinia binotata</i>), African civet (<i>Civettictis civetta</i>), Pardine genet (<i>Genetta pardina</i>), African straw-coloured fruit bat (<i>Eidolon helvum</i>), Egyptian fruit bat (<i>Rousettus aegyptiacus</i>), four-toed hedgehog (<i>Atelerix albiventris</i>), red-bellied monkey (<i>Cercopithecus erythrogaster</i>), patas monkey (<i>Erythrocebus patas</i>), Demidoff's dwarf galago (<i>Galagoides cf. demidoff</i>).	Campylobacteriosis; Endemic relapsing fever; Gastroenteritis; Mycobacteriosis/Tuberculosis; Salmonellosis; Yersiniosis; Septicaemia/general infection; Bartonellosis; Pneumonia; Psittacosis; Q-fever; Brucellosis; Leptospirosis; Hepatitis-A; West Nile virus; Herpesvirus simiae-B; Monkeypox; Molluscum contagiosum; Measles; Rabies; Haemorrhagic fever; Newcastle disease; Cowpox; Coccidiomycosis; Streptothricosis; Candidiasis; Ringworm; Histoplasmosis
Reptile	Geyr's spiny-tailed lizard (<i>Uromastyx geyri</i>), Slender chameleon (<i>Chamaeleo gracilis</i>), at-tail gecko (<i>Hemitheconyx caudicinctus</i>), Savannah monitor lizard (<i>Varanus exanthematicus</i>), King cobra (<i>Ophiophagus Hannah</i>), red-headed krait (<i>Bungarus flaviceps</i>), green bush viper (<i>Atheris chlorechis</i>), African softshell turtle (<i>Trionyx triunguis</i>), Senegal flapshell turtle (<i>Cyclanorbis senegalensis</i>), Home's hinge-back tortoise (<i>Kinixys homeana</i>)	Campylobacteriosis; Endemic relapsing fever; Gastroenteritis; Mycobacteriosis/Tuberculosis; Salmonellosis; Streptococcosis; Yersiniosis; Q-fever; Vibriosis; Leptospirosis; Western encephalitis; West Nile virus; Coccidiomycosis; Cryptococcosis; Septicaemia

Legality

Legal wild animal trade, which is diverse and huge, currently guarantees neither adequate species conservation, animal welfare standards, nor biosecurity. This is partly due to the fact that there is no overarching body to address the full range of risks associated with the global supply of exotic pets. Although there are a number of international entities and corporations that could play an influential role, often they do not live up to their responsibilities. When considering calls to improve wildlife trade regulation, it is also critical to consider that legal and illegal trade are not always easily distinguishable, and a close complex relationship exists between these markets¹³⁰. Wildlife trade can be legal, illegal, or a combination of both, depending on how a species is classified as it moves through the market chain¹³¹. Legal wildlife trade can also be difficult to monitor due to unintentional mistakes, such as inadequate record keeping, and mislabelling of species^{132 133 134}. This creates opportunities for crossover and intentional fraudulent activity, such as when legal operations, including wildlife farms, act as “cover” to launder poached wildlife¹³⁵. Similarly, criminal networks are known to seek influence over legally operating wildlife industries, and previous attempts to sustainably manage some aspects of legal trade have failed due to their involvement.¹³⁶

With regards to conservation, this investigation found that only a minority of the species identified in the social media posts, including those relating to shipments made by Ethiopian Airlines, are currently regulated under CITES. Those that are currently covered under this international treaty, which operates via a system of trade permits, quotas and bans, include the savannah monitor lizard, African spurred tortoise, forest hinge-back tortoise, African civet, and the ball

python (See table 10). However, the social media posts observed in this investigation raise concerns that some of the shipments relating to these species may have been made without the required permits or properly adhered to export quotas (See below). Consequently, whether or not these (and other) international movements originating from West Africa complied with CITES regulations warrants further investigation. It is also important to highlight that although the vast majority of species advertised and shipped are not protected under CITES, this does not mean that trade is not a conservation concern now or in the future. This is because currently CITES operates using a ‘negative list’ approach, which places the burden of proof on the conservationist to prove trade in a given species is unsustainable, rather than the trader to prove that it is not. The automatic assumption is that trade is sustainable unless proved otherwise.

Even if trade in a given species were proven to be sustainable, conventional definitions of sustainability typically do not take other key aspects such as animal welfare and public health issues into consideration. In terms of animal welfare protection, at a national level, the physical and mental wellbeing of traded wildlife is beyond the remit of CITES. So in the absence of sufficient local animal welfare laws, even CITES-listed species are not protected until they reach an international border where CITES requires Parties to ensure ‘minimal delays’ in processing and transport, and ‘proper care’ of live wild animals. Similarly IATA Live Animal Regulations (the worldwide standard for transporting live animals by commercial airlines) only come into force when animals are actually loaded onto the airline. Then they essentially aim for wild animals to “survive” rather than “thrive” during the transport process.

Although the vast majority of species advertised and shipped are not protected under CITES, this does not mean that trade is not a conservation concern now or in the future.

Yet, even with these guidelines in force, observation of some of the images from this investigation, including some linked to Ethiopian Airlines shipments, suggest that they too are not being followed. For example, images showing animals being packaged for shipping revealed at least some cases where (in terms of space criteria alone) tortoises packed in restricted spaces were highly unlikely to be able to fully extend their head and neck during the journey. Although further on-the-ground research is required to establish the degree of compliance with IATA Live Animal Regulations, any airlines found to be in violation of the regulations may be subject to legal penalties.

When it comes to biosecurity, safeguarding of human health falls under the remit of several international organisations, including the WHO and OIE. However, their role is primarily advisory. In general, there is a lack of surveillance for key animal diseases in

most countries, and minimal health monitoring systems exist surrounding the trade of some wild animals, heightening the potential risk for cross-border disease movement¹³⁷. Consequently, biosecurity can be handled very differently across airports and countries, depending on the company that runs the airport, ground handling services, import/export departments, government-specific requirements, airlines' own standard of facilities and staff training, and the airports own standards. Although biosecurity protocols (such as risk assessments, border controls, and post-border surveillance) can help to lower the risk of zoonotic disease introduction, effective surveillance and control is hindered by a number of factors, including the wide variety of species involved and the complex natural history of zoonotic agents. Consequently, it is logical to assume that trade bans apply a more cautionary approach that maximises the chances of preventing the spread and emergence of zoonotic disease.

Trade bans apply a more cautionary approach that maximises the chances of preventing the spread and emergence of zoonotic disease.

Photo: Western tree hyrax (*Dendrohyrax dorsalis sylvestris*) in holding containers at a snake farm in Togo.



Table 10: Summary of the species advertised for sale by the two wildlife social media profiles in Togo 2016-2020 that are currently regulated under CITES. * Confirmed as shipped via Ethiopian Airlines. ** Uplisted to Appendix I in November 2019.

Species name	CITES Appendices	Current Quotas / restrictions	Quotas / restriction 2016-2020
Savannah monitor lizard (<i>Varanus exanthematicus</i>)*	II	Togo: 15,000 ranched, 4,000 wild-taken	Togo: 3,000-4,000 wild-taken, 7,000-15,000 ranched
Ornate monitor (<i>Varanus ornatus</i>)	II	Togo: ranched in prep., wild-taken in prep., Benin: 2,000 ranched	Togo: 1,000 wild-taken, 7,000 ranched
Nile monitor (<i>Varanus niloticus</i>)	II	Togo: 4,000 wild-taken, 7,000 ranched	Togo: 3,500-4,000 wild-taken, 7,000-7,500 ranched
Senegal chameleon (<i>Chamaeleo senegalensis</i>)*	II	Togo: 6,000 ranched, 5,000 wild-taken	Togo: 6,000 ranched, 5,000 wild-taken
Graceful chameleon (<i>Chamaeleo gracilis</i>)	II	Togo: zero quota for both ranched and wild-caught	Togo: 2,500 ranched, 0-500 wild-taken
African civet (<i>Civettictis civetta</i>)*	III (Botswana)	No quota for Togo	No quota for Togo
Black crowned crane (<i>Balearica pavonina</i>)	I	Zero commercial trade	No quota for Togo
Guinea turaco (<i>Tauraco persa</i>)	II	No quota for Togo	No quota for Togo
Hooded vulture (<i>Necrosyrtes monachus</i>)	II	No quota for Togo	No quota for Togo
Violet turaco (<i>Musophaga [Tauraco] violacea</i>)	III	No quota for Togo	No quota for Togo
Timneh parrot (<i>Psittacus cf. timneh</i>)	I	Zero commercial trade	No quota for Togo. Zero comercial trade since 2017
Senegal parrot (<i>Poicephalus senegalus</i>)	II	Togo: 300 wild-taken	Togo: 300 wild-taken
Red-headed lovebird (<i>Agapornis pullarius</i>)	II	Togo: 1,000 wild-taken	Togo: 500-1,000 wild-taken
Southern Saharan spiny-tailed lizard (<i>Uromastyx cf. dispar ssp.</i>)	II	No current quotas	No quota for Togo
Geyr's Spiny-tailed lizard (<i>Uromastyx geyri</i>)	II	No quota for Togo	No quota for Togo
Black Spiny-tailed lizard (<i>Uromastyx acanthinura</i>)	II	No current quotas	No quota for Togo

Table 10: Summary of the species advertised for sale by the two wildlife social media profiles in Togo 2016-2020 that are currently regulated under CITES. * Confirmed as shipped via Ethiopian Airlines. ** Uplisted to Appendix I in November 2019. (cont.)

Species name	CITES Appendices	Current Quotas / restrictions	Quotas / restriction 2016-2020
Calabar ground python (<i>Calabaria reinhardtii</i>)	II	Togo: 800 ranched, 200 wild-taken; Benin: 100 wild-taken	Togo: 100-800 ranched, 100-200 wild-taken; Benin: 100 wild-taken
Müller's sand boa (<i>Eryx muelleri</i>)	II	No current quotas	No quota for Togo
King cobra (<i>Ophiophagus hannah</i>)	II	No quota for Togo	No quota for Togo
African rock python (<i>Python sebae</i>)	II	Togo: 1,000 ranched, 50 wild-taken; Benin: 100 ranched, 50 wild-taken	Togo: 1,000-2,000 ranched, 50 wild-taken; Benin: 50-200 ranched, 50-200 wild-taken; Ghana 1,000 ranched, 360 wild-taken
Ball python (<i>Python regius</i>)*	II	Togo: 1,500 wild-taken, 62,500 ranched	Togo: 1,500 wild-taken, 62,500 ranched
Forest hinge-back tortoise (<i>Kinixys erosa</i>)*	II	No quota for Togo, Ghana: 120 wild-taken, Benin: 100 wild-taken	No quota for Togo; Benin: 100-200 wild-taken; Ghana: 120 wild-taken
Home's hinge-back tortoise (<i>Kinixys homeana</i>)	II	Togo: zero quota; Benin: zero quota; Ghana: 340 wild-taken	Togo: 0-2,000 ranched, 0-500 wild-taken; Ghana: 340 wild-taken; Benin: 0-50 wild-taken, 0-800 ranched, 0-30 captive-bred
Bell's hinge-back tortoise (<i>Kinixys nogueyi</i>)	II	Togo: 3,500 ranched; Benin: 30 captive-bred, 400 ranched, 100 wild-taken; Ghana: 400 wild-taken	Togo: 3,500 ranched; Benin: 30 captive-bred, 400 ranched, 100 wild-taken; Ghana: 400 wild-taken
Bell's hinge-back tortoise (<i>Kinixys belliana</i>)	II	Togo: 3,500 ranched, 500 wild-taken; Benin: 200 wild-taken; Ghana: 140 wild-taken	Togo: 3,500 ranched, 500 wild-taken; Benin: 100-200 wild-taken, 30 captive-bred, 400 ranched; Ghana: 140 wild-taken
African spurred tortoise (<i>Centrochelys [Geochelone] sulcata</i>)*	II	Togo: zero wild-taken, 700 captive-bred; Benin zero wild-taken, 200 captive-bred	Togo: zero wild-taken, 700-1,500 captive-bred; Benin: 10 ranched, 50 captive-bred
Senegal flapshell turtle (<i>Cyclanorbis senegalensis</i>)	II	Togo: 100 wild-taken, 500 ranched; Benin: 200 wild-taken	Togo: 100 wild-taken, 500 ranched; Benin: 200 wild-taken
Nupian flapshell turtle (<i>Cyclanorbis elegans</i>)* **	II	No current quotas	No quotas - suspension of all commercial trade
African softshell turtle (<i>Trionyx triunguis</i>)	II	Togo: 200 ranched, 50 wild-taken	Togo: 300 ranched, 50 wild-taken



Photo: Geyr's spiny-tailed lizards (*Uromastix geyri*) in holding containers at a snake farm in Togo.

Uromastix lizards

Some species identified in the images and footage are not found in Togo, or are scarce in the wild, which raises concerns that species are being transported across national borders (in some cases illegally, or in excess of agreed quotas) before being exported to other continents. The Geyr's spiny-tailed lizard (*Uromastix geyri*), for example, was advertised for sale from the snake farms in Togo. However, this species is not found in Togo but is present in the wild in neighbouring Niger, where it has been subject to a zero export quota since 2008.¹³⁸





Photo: Hinge-back tortoises (*Kinixys* sp.) in shipping crates ready for export from West Africa.

Hinge-back tortoise

Evidence shows that several shipments of animals left West Africa from neighbouring Ghana. It is possible that for some species, exporters have used Ghana to circumvent limited trade quotas in Togo. For example, shipments of the Home's hinge-back tortoise (*Kinixys homeana*) were exported from Ghana where there is an export quota of several hundred wild-sourced specimens, while Togo has had a zero export quota for this species since 2016¹³⁹.





Photo: An African spurred tortoise in a shipping container ready for export from a snake farm in Togo.

Chelonian / IATA

Evidence from images and footage reveal poor animal welfare standards both in holding and shipping facilities at the snake farms in Togo. Images showing animals being packaged for shipping revealed that tortoises, such as the African spurred tortoise, were often packed in such restricted spaces they were highly unlikely to be able to fully extend their head and neck during the journey. Although further research is required to establish the degree of compliance with IATA Live Animal Regulations. There are also concerns that some of the shipments relating to this species may have been made without the required permits or properly adhered to export quotas. In June this year, for example, a shipment of 555 juvenile African spurred tortoises was seized by customs officers in Burkina Faso from international traffickers who had illegally smuggled them, along with fake CITES permits, on a bus travelling between Bamako in Mali and Lomé.¹⁴⁰





Photo: African civets (*Civettictis civetta*) in holding containers at a snake farm in Togo.

Civet

Evidence from the footage and images highlights insufficient biosecurity measures in place at the snake farms. Animals that are known to host pathogens with potential significance for human health were frequently available for sale and export, including small mammals such as civets (*Civettictis civetta*), which can harbour several pathogens including 11 viruses that have potential significance for human and animal health¹⁴¹. Evidence shows images of civets being handled at the farms despite the risk of zoonotic disease transfer.



Covid-19 - business as usual

This investigation found that the trade in wild animals from the two social media accounts in Togo has continued through 2020 and 2021, despite public health concerns arising from the Covid-19 pandemic. In particular, evidence from posts made from the two accounts shows that wild animals that represent a particularly high biosecurity risk were still available for sale and/or were being shipped during 2020 and 2021, including primates (such as patas monkeys (*Erthrocebus patas*)), small rodents, and pardine genets (*Genetta pardina*).

Recent posts also show that wild animals (such as ornate monitor lizards (*Varanus ornatus*), African spurred tortoises (*Geochelone sulcata*), ball pythons (*Python regius*) and forest hinge-back tortoises (*Kinixys erosa*)) are still being kept in holding and shipping conditions that raise serious animal welfare concerns. In some cases, animals were packed so tightly and with such limited space that they would be unlikely to be able to stretch out and perform their natural behaviours.

Species that are at risk from extinction also feature in posts through 2020 and 2021, including the Vulnerable African spurred tortoise and black-crowned crane (*Balearica pavonina*). Furthermore, species that are currently regulated under CITES are also recently shown as being shipped and/or available for sale, including the ball python, ornate monitor lizard, African spurred tortoise and

forest hinge-back tortoise. Social media posts continue to raise concerns that some of the shipments related to CITES listed species may have been made without the required permits or properly adhered to export quotas.

As recently as June this year, it was reported that customs officers in Burkina Faso seized 555 juvenile African spurred tortoises with a commercial value of US\$83,000 from international traffickers. They had illegally smuggled them in the baggage compartment of a bus travelling to Lomé, accompanied by fake CITES permits¹⁴². If this shipment hadn't been intercepted, it is likely that these tortoises would have been illegally exported internationally.

As air passenger numbers fell around the world in 2020 and 2021 due to the Covid-19 outbreak, Ethiopian Airlines made the decision to temporarily convert passenger aircraft into cargo operations to maintain revenue¹⁴³. They also continued flying to China, when other major African airlines suspended their operations. Visible Airway Bill numbers on social media posts provide evidence that Ethiopian Airlines also continued to play a role in facilitating international trade in wildlife from Africa during this time. The evidence shows that at least four shipments carrying wild animals - including snakes, lizards, tortoises, and spiders - were exported from Togo between October 2020 and March 2021 via Ethiopian Cargo to destinations in Russia, Japan, and Malaysia.



Photo: Shipping crates containing wild animals ready for export from West Africa in 2020.



Photo: An African civet (*Civettictis civetta*) available for sale and export from a snake farm in Togo.

Conclusion

This research report provides the most detailed insight to date into the diversity and global extent of commercial wildlife trade activity from a recognised trade hub and major exporter of live wild animals in West Africa. It lifts the lid on a largely unregulated wildlife trade and reveals that snake farms in West Africa do much more than feed the international demand for Ball pythons as pets. They also act as wider trade hubs, exporting a vast diversity of other live wildlife, sourced and transported in inhumane conditions to destinations around the world where they are used merely as luxury pets.

Many wild animal species, both iconic and little known, are being mercilessly exploited at a global scale, with animals suffering immensely. Also given the huge numbers of individuals and species being unsustainably shipped out of Africa, the continent is suffering serious biodiversity hemorrhage. If this continues, this region is at risk of irreversible ecological collapse, having a devastating impact on economies and livelihoods in Africa.

The inhumane way these animals are taken from the wild, farmed in captivity, and shipped in planes in cramped containers does not only infringe on their welfare and a right to a life in the wild, it also raises serious legal, conservation and public health concerns. Keeping wild animals in unsanitary conditions, with little regard for biosecurity standards as identified by this report, is a recipe for disaster. It creates a high risk of pathogen spillovers between species and people, which could potentially lead to deadly

zoonotic emerging infectious diseases like Covid-19. The global pandemic has brought world economies to their knees, overwhelmed health systems and so far killed more than 3 million people globally.¹⁴⁴

While the internet and the aviation industry have helped to connect the world, this report demonstrates they have also helped to fuel wildlife trade. In particular, whereas Ethiopian Airlines is helping to deliver lifesaving Covid-19 emergency vaccines to Africa, it could also be distributing viruses and other disease-causing organisms around the world by continuing to ship wild animals, including high risk mammals such as primates, genets, civets and mongooses.

Many people in Africa currently depend on commercial exploitation of wildlife. However, the argument that wildlife trade supports local livelihoods and brings economic benefits in the long term can no longer be justified. This is especially true in the face of the enormous public health, economic, social and environmental risks associated with the inhumane exploitation of wild animals. As part of a societal rethink about how we view and treat wild animals, Governments must work to shift people from dependence on exploiting them to humane livelihood alternatives. Enforcement and monitoring of cross-border wildlife trade must be strengthened in order to curb illegal and unregulated cross-border trade, while ensuring wild animals are humanely protected in the wild.

Call to action

The global wildlife trade must not fly

Ethiopian Airlines is a source of great national pride in Ethiopia – and Africa more widely. Its ambitions to become one of the premier aviation groups in the world, both financially and as a leader in corporate social responsibility, is clear. However, as Ethiopian realises its ambitions and connects Africa and the world, it must ensure that it does not jeopardise those connections and its environmental obligations. In fact, its unique role and success on the African continent provides the opportunity to fulfil its social obligations and act to safeguard the world against pandemics, while protecting African wildlife. A few years ago, Turkish Airlines and Turkish Cargo ceased shipping African grey parrots from Africa¹⁴⁵. It showed the way, and we believe Ethiopian Airlines can demonstrate similar leadership to prevent animal suffering and future pandemics.

World Animal Protection campaigns in Africa for the welfare, survival and rights of Africa's wild animals, big and small. That means working with businesses to become wildlife-friendly and making sure Africa's laws are changed and enforced to protect, not to exploit wild animals and their habitats.

Therefore, we call upon;

Ethiopian Airlines and other airlines to:

1. Publicly commit to completely cease the commercial shipping of all live wild animals on their planes in the long term. Wildlife has the right to a wild life and should not be shipped around the world to be used as luxury pets, medicines, fashion or for entertainment
2. Step up efforts to stop any illegal or irregular trade in wild animals that falls short of welfare requirements, aviation industry standards (IATA) or conservation rules (CITES)
3. In the shorter term, immediately stop the shipping of live wild animals that represent the highest biosecurity risk (i.e. bats, small mammals and primates) on their planes to help prevent future pandemics

Governments of Togo and Ghana to:

1. Move people dependent on wildlife trade to livelihood alternatives that do not exploit wild animals for luxury pets, medicines, fashion or for cruel entertainment
2. Strengthen regulation and enforce cross border-monitoring of wildlife trade to curb illegal and unregulated trade
3. Reduce wild animal exports – and in the long term – end wildlife trade and protect wild animals in their natural habitats, because that is where they belong.

The public to:

Not capture, buy or sell wild animals, and to move away from using airlines known to be involved in transporting live wild animals for commercial purposes.

References

1. EIA (2020). Out of Africa: How West and Central Africa have become the epicentre of ivory and pangolin scale trafficking to Asia. eia-international.org/wp-content/uploads/Out-of-Africa-SINGLE-PAGES.pdf [Accessed 15 June 2021].
2. Affre A, Ineich I, Ringuet S (2005) West Africa, Madagascar, Central and South America: Main origins of the CITES-listed lizard pet market in France. *Herpetological Review* 36: 133–137.
3. Jensen TJ, Auliya M, Burgess ND, Aust PW, Pertoldi C, Strand J. (2018). Exploring the international trade in African snakes not listed on CITES: Highlighting the role of the internet and social media. *Biodiversity and Conservation*. doi.org/10.1007/s10531-018-1632-9
4. Lambert; Carder; D’Cruze. (2019). Given the Cold Shoulder: A Review of the Scientific Literature for Evidence of Reptile Sentience. *Animals*, 9, 821, doi:10.3390/ani9100821.
5. Proctor, H. (2012). Animal Sentience: Where Are We and Where Are We Heading? *Animals*, 2, 628–639, doi:10.3390/ani2040628.
6. Baker, S.E.; Cain, R.; Van Kesteren, F.; Zommers, Z.A.; D’Cruze, N.; Macdonald, D.W. (2013). Rough Trade: Animal Welfare in the Global Wildlife Trade. *BioScience*, 63, 928–938, doi:10.1525/bio.2013.63.12.6.
7. IUCN (2021). iucnredlist.org/ [Accessed 14 June 2021].
8. D’Cruze, N.; Harrington, L.A.; Assou, D.; Green, J.; Macdonald, D.W.; Ronfot, D.; Hoinsoudé Segniagbeto, G.; Auliya, M. (2020). Betting the farm: A review of Ball Python and other reptile trade from Togo, West Africa. *NC*, 40, 65–91, doi:10.3897/natureconservation.40.48046.
9. Auliya, M.; Hofmann, S.; Segniagbeto, G.H.; Assou, D.; Ronfot, D.; Astrin, J.J.; Forat, S.; Koffivi K. Ketoh, G.; D’Cruze, N. (2020). The first genetic assessment of wild and farmed ball pythons (Reptilia, Serpentes, Pythonidae) in southern Togo. *NC*, 38, 37–59, doi:10.3897/natureconservation.38.49478.
10. Baker, S.E.; Cain, R.; Van Kesteren, F.; Zommers, Z.A.; D’Cruze, N.; Macdonald, D.W. (2013). Rough Trade: Animal Welfare in the Global Wildlife Trade. *BioScience*, 63, 928–938, doi:10.1525/bio.2013.63.12.6.
11. Jones, K.E.; Patel, N.G.; Levy, M.A.; Storeygard, A.; Balk, D.; Gittleman, J.L.; Daszak, P. (2008). Global trends in emerging infectious diseases. *Nature*, 451, 990–993, doi:10.1038/nature06536.
12. Van Dorn, HR (2014) Emerging Infectious Diseases – Medicine (Abingdon). doi.org/10.1016/j.mpmed.2013.10.014
13. Hammer, A.S.; Quaade, M.L.; Rasmussen, T.B.; Fonager, J.; Rasmussen, M.; Mundbjerg, K.; Lohse, L.; Strandbygaard, B.; Jørgensen, C.S.; Alfaro-Núñez, A.; et al. (2021). SARS-CoV-2 Transmission between Mink (*Neovison vison*) and Humans, Denmark. *Emerg. Infect. Dis.*, 27, doi:10.3201/eid2702.203794.
14. Zhang, T.; Wu, Q.; Zhang, Z. (2020). Probable Pangolin Origin of SARS-CoV-2 Associated with the Covid-19 Outbreak. *Current Biology*, 30, 1346-1351.e2, doi:10.1016/j.cub.2020.03.022.
15. Aguirre, A.A.; Catherina, R.; Frye, H.; Shelley, L. (2020). Illicit Wildlife Trade, Wet Markets, and COVID-19: Preventing Future Pandemics. *World Medical & Health Policy*, 12, 256–265, doi:10.1002/wmh3.348.
16. Zhou, P.; Yang, X.-L.; Wang, X.-G.; Hu, B.; Zhang, L.; Zhang, W.; Si, H.-R.; Zhu, Y.; Li, B.; Huang, C.-L.; et al. (2020) A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579, 270–273, doi:10.1038/s41586-020-2012-7.
17. WHO (2019). Middle East respiratory syndrome coronavirus (MERS-CoV). [who.int/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-\(mers-cov\)](http://who.int/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-(mers-cov)) [Accessed 14 June 2021].
18. Aguirre, A.A.; Catherina, R.; Frye, H.; Shelley, L. (2020). Illicit Wildlife Trade, Wet Markets, and COVID-19: Preventing Future Pandemics. *World Medical & Health Policy*, 12, 256–265, doi:10.1002/wmh3.348.
19. Broad, S.; Mulliken, T.; Roe, D. (2003). The nature and extent of legal and illegal trade in wildlife. *The trade in wildlife: regulation for conservation*.
20. Lockwood, J.L.; Welbourne, D.J.; Romagosa, C.M.; Cassey, P.; Mandrak, N.E.; Strecker, A.; Leung, B.; Stringham, O.C.; Udell, B.; Episcopo-Sturgeon, D.J.; et al. (2019). When pets become pests: the role of the exotic pet trade in producing invasive vertebrate animals. *Front Ecol Environ*, 2019, doi:10.1002/fee.2059.
21. Smith, K. M., Machalaba, C. M., Jones, H., Caceres, P., Popovic, M., Olival, K. J., ... & Karesh, W. B. (2017). Wildlife hosts for OIE-listed diseases: considerations regarding global wildlife trade and host-pathogen relationships. *Veterinary medicine and science*, 3(2), 71-81.
22. World Animal Protection (2019b). Turkish Airlines gets on board to protect African grey parrots, thanks to 188,099 of you. worldanimalprotection.org/news/turkish-airlines-gets-board-protect-african-grey-parrots-thanks-188099-you [Accessed 14 June 2021].
23. TRAFFIC (2020). Legal Wildlife Trade Available online: traffic.org/about-us/legal-wildlife-trade/ [accessed on Nov 1, 2020].
24. IPBES (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.
25. World Animal Protection (2019). Exploiting Africa’s Wildlife – ‘the big five and little five’. worldanimalprotection.org/news/sale-africas-wildlife-cruelty-big-five-and-little-five-animals-revealed [Accessed 14 June 2021].
26. Zhang, T.; Wu, Q.; Zhang, Z. (2020). Probable Pangolin Origin of SARS-CoV-2 Associated with the Covid-19 Outbreak. *Current Biology*, 30, 1346-1351.e2, doi:10.1016/j.cub.2020.03.022.
27. Aguirre, A.A.; Catherina, R.; Frye, H.; Shelley, L. (2020). Illicit Wildlife Trade, Wet Markets, and COVID-19: Preventing Future Pandemics. *World Medical & Health Policy*, 12, 256–265, doi:10.1002/wmh3.348.
28. Zhou, P.; Yang, X.-L.; Wang, X.-G.; Hu, B.; Zhang, L.; Zhang, W.; Si, H.-R.; Zhu, Y.; Li, B.; Huang, C.-L.; et al. (2020) A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579, 270–273, doi:10.1038/s41586-020-2012-7.
29. WHO (2021b). WHO Coronavirus Dashboard. covid19.who.int/ [Accessed 15 June 2021].
30. Jones, K.E.; Patel, N.G.; Levy, M.A.; Storeygard, A.; Balk, D.; Gittleman, J.L.; Daszak, P. (2008). Global trends in emerging infectious diseases. *Nature*, 451, 990–993, doi:10.1038/nature06536.
31. Godoy, S.N.; Matushima, E.R. (2010). A Survey of Diseases in Passeriform Birds Obtained From Illegal Wildlife Trade in São Paulo City, Brazil. *Journal of Avian Medicine and Surgery*, 24, 199–209, doi:10.1647/2009-029.1.
32. WHO, OIE and UNEP (12th April 2021) Reducing public health risks associated with the sale of live wild animals of mammalian species in traditional food markets. <https://www.track-trace.com/aircargo>
33. speciesplus.net/
34. World Animal Protection (2020) Ball pythons are wildlife #NotPets Documentary. youtube.com/watch?v=IRIA80twB6E
35. D’Cruze, N.; Harrington, L.A.; Assou, D.; Green, J.; Macdonald, D.W.; Ronfot, D.; Hoinsoudé Segniagbeto, G.; Auliya, M. (2020). Betting the farm: A review of Ball Python and other reptile trade from Togo, West Africa. *NC*, 40, 65–91, doi:10.3897/natureconservation.40.48046.
36. Harrington, L.A.; Green, J. et al (2020) Snakes and ladders: A review of ball python production in West Africa for the global pet market. natureconservation.pensoft.net/article/51270/

38. UNEP-WCMC. (2010). Review of species/country combinations subject to long-standing import suspensions: reptile species from Africa.
39. The Africa Logistics (2020). theafricalogistics.com/2020/06/22/top-10-largest-airlines-in-africa-2/ [Accessed 12 June 2021].
40. Ethiopian Airlines (2021). ethiopiancargo.azurewebsites.net/index/ethiopian-marks-one-year-since-the-first-preighter-operation-on-passenger-aircraft [Accessed 14 June 2021].
41. Ethiopian Airlines (2019). Annual Report 2018/19. corporate.ethiopianairlines.com/docs/default-source/annual-performance-reports/et-annual-report-2018-19.pdf?sfvrsn=84e49858_2 [Accessed 14 June 2021].
42. Ethiopian Airlines (2020). Ethiopian Factsheet December 2020. corporate.ethiopianairlines.com/docs/default-source/ethiopian-factsheet/fact-sheet-december-2020.pdf?sfvrsn=7e17532_2
43. African Airlines Association (AFRAA) (2020). Annual Report 2020. afraa.org/wp-content/uploads/2020/11/Annual-Report_2020_web.pdf
44. CAPA Centre for Aviation (2021). Cargo demand & supply: Qatar Airways reinforces global #1 position. centreforaviation.com/analysis/reports/cargo-demand-supply-qatar-airways-reinforces-global-1-position-548812 [Accessed 14 June 2021].
45. Ethiopian Airlines (2021). ethiopiancargo.azurewebsites.net/index/ethiopian-marks-one-year-since-the-first-preighter-operation-on-passenger-aircraft [Accessed 14 June 2021].
46. Ethiopian Airlines (2021). ethiopiancargo.azurewebsites.net/index/ethiopian-marks-one-year-since-the-first-preighter-operation-on-passenger-aircraft [Accessed 14 June 2021].
47. Ethiopian Airlines (2021b). Our Vision 2035. ethiopiancargo.azurewebsites.net/about-us/vision [Accessed 14 June 2021].
48. Ethiopian Airlines (2021c). Ethiopian Environmental Policy. corporate.ethiopianairlines.com/company/responsibility/ethiopian-airlines-environmental-policy [Accessed 14 June 2021].
49. Ethiopian Airlines (2021). ethiopiancargo.azurewebsites.net/index/ethiopian-marks-one-year-since-the-first-preighter-operation-on-passenger-aircraft [Accessed 14 June 2021].
50. Proctor, H. (2012). Animal Sentience: Where Are We and Where Are We Heading? *Animals*, 2, 628–639, doi:10.3390/ani2040628.
51. Lambert; Carder; D’Cruze. (2019). Given the Cold Shoulder: A Review of the Scientific Literature for Evidence of Reptile Sentience. *Animals*, 9, 821, doi:10.3390/ani9100821.
52. Baker, S.E.; Cain, R.; Van Kesteren, F.; Zommers, Z.A.; D’Cruze, N.; Macdonald, D.W. (2013). Rough Trade: Animal Welfare in the Global Wildlife Trade. *BioScience*, 63, 928–938, doi:10.1525/bio.2013.63.12.6.
53. World Animal Protection. (2020b) Suffering in silence. Uncovering the cruelty of the global trade in Ball pythons. www.worldanimalprotection.org.uk/campaigns/animals-wild/ball-python-documentary [Accessed 12 June 2021].
54. World Animal Protection (2019c). Wild at heart: The cruelty of the exotic pet trade. worldanimalprotection.org.au/sites/default/files/media/au_files/wild-at-heart-report-2019.pdf [Accessed 14 June 2021].
55. BirdLife International. (2018). *Psittacus erithacus*. The IUCN Red List of Threatened Species 2018: e.T22724813A129879439. dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22724813A129879439.en.
56. BirdLife International. (2018). *Psittacus erithacus*. The IUCN Red List of Threatened Species 2018: e.T22724813A129879439. dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22724813A129879439.en.
57. BirdLife International. (2018). *Psittacus erithacus*. The IUCN Red List of Threatened Species 2018: e.T22724813A129879439. dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22724813A129879439.en.
58. Schmid, Doherr & Steiger. (2006) Schmid R, Doherr MG, Steiger A. The influence of the breeding method on the behaviour of adult African grey parrots (*Psittacus erithacus*) *Applied Animal Behaviour Science*. 2006;98(3):293–307. doi: 10.1016/j.applanim.2005.09.002.
59. McGowan, P. (2001). Status, Management, and Conservation of the African Grey Parrot *Psittacus erithacus* in Nigeria. Geneva: CITES.
60. Clemmons, J. R. (2003). Status Survey of the African Grey Parrot (*Psittacus erithacus timneh*) and Development of a Management Program in Guinea and Guinea-Bissau. Geneva: CITES, 23pp. Available online at: cites.org/eng/com/ac/22/E22-10-2-A1.pdf
61. Svensson, M., Bersacola, E. & Bearder, S. (2019). *Galagoides demidoff*. The IUCN Red List of Threatened Species 2019: e.T40649A17962255. dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T40649A17962255.en.
62. The Humane Society (2012). Captive Primate Welfare Issues. humanesociety.org/sites/default/files/docs/captive-primate-welfare-factsheet.pdf [Accessed 12 June 2021].
63. de Jong, Y.A., Rylands, A.B. & Butynski, T.M. (2020). *Erythrocebus patas*. The IUCN Red List of Threatened Species 2020: e.T174391079A17940998. dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T174391079A17940998.en.
64. Huber, H. F., & Lewis, K. P. (2011). An assessment of gum-based environmental enrichment for captive gummivorous primates. *Zoo Biology*, 30(1), 71-78.
65. The Humane Society (2012). Captive Primate Welfare Issues. humanesociety.org/sites/default/files/docs/captive-primate-welfare-factsheet.pdf [Accessed 12 June 2021].
66. Cassola, F. (2016). *Atelerix albiventris* (errata version published in 2017). The IUCN Red List of Threatened Species 2016: e.T40602A115174097. doi.org/10.2305/IUCN.UK.2016-3.RLTS.T40602A22324217.en.
67. Cassola, F. (2016). *Atelerix albiventris* (errata version published in 2017). The IUCN Red List of Threatened Species 2016: e.T40602A115174097. doi.org/10.2305/IUCN.UK.2016-3.RLTS.T40602A22324217.en.
68. Phair, K. Carpenter, J. W. Marrow, J. Andrews, G. and Bawa, B. (2011). Management of an extraskeletal osteosarcoma in an African hedgehog (*Atelerix albiventris*). *Journal of Exotic Pet Medicine*. 20(2) 151-155.
69. Santana, E. M., Jantz, H. E., & Best, T. L. (2010). *Atelerix albiventris* (Erinaceomorpha: Erinaceidae). *Mammalian Species*, 42(857), 99-110.
70. Gaubert, P. & Do Linh San, E. (2016). *Genetta pardina*. The IUCN Red List of Threatened Species 2016: e.T136437A45221360. dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T136437A45221360.en.
71. Gaubert, P. & Do Linh San, E. (2016). *Genetta pardina*. The IUCN Red List of Threatened Species 2016: e.T136437A45221360. dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T136437A45221360.en.
72. Do Linh San, E., Maddock, A.H., Gaubert, P. & Palomares, F. (2016). *Herpestes ichneumon*. The IUCN Red List of Threatened Species 2016: e.T41613A45207211. dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T41613A45207211.en.
73. Do Linh San, E., Maddock, A.H., Gaubert, P. & Palomares, F. (2016). *Herpestes ichneumon*. The IUCN Red List of Threatened Species 2016: e.T41613A45207211. dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T41613A45207211.en.
74. AWF (2021). Bat. awf.org/wildlife-conservation/bat [Accessed 14 June 2021].
75. Cooper-Bohannon, R., Mickleburgh, S., Hutson, A.M., Bergmans, W., Fahr, J. & Racey, P.A. (2020). *Eidolon helvum*. The IUCN Red List of Threatened Species 2020: e.T7084A22028026. doi.org/10.2305/IUCN.UK.2020-2.RLTS.T7084A22028026.en.

76. Korine, C. (2016). *Rousettus aegyptiacus*. The IUCN Red List of Threatened Species 2016: e.T29730A22043105. [dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T29730A22043105.en](https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T29730A22043105.en).
77. Korine, C. (2016). *Rousettus aegyptiacus*. The IUCN Red List of Threatened Species 2016: e.T29730A22043105. [dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T29730A22043105.en](https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T29730A22043105.en).
78. Auliya, M., Schmitz, A. (2010). *Python regius*. The IUCN Red List of Threatened Species 2010: e.T177562A7457411. [dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T177562A7457411.en](https://doi.org/10.2305/IUCN.UK.2010-4.RLTS.T177562A7457411.en).
79. Auliya, M., Schmitz, A. (2010). *Python regius*. The IUCN Red List of Threatened Species 2010: e.T177562A7457411. [dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T177562A7457411.en](https://doi.org/10.2305/IUCN.UK.2010-4.RLTS.T177562A7457411.en).
80. D’Cruze, N., Harrington, L. A., Assou, D., Ronfot, D., Macdonald, D. W., Segniagbeto, G. H., & Auliya, M. (2020c). Searching for snakes: Ball python hunting in southern Togo, West Africa. *Nature Conservation*, 38, 13.
81. D’Cruze, N.; Harrington, L.A.; Assou, D.; Green, J.; Macdonald, D.W.; Ronfot, D.; Hoinsoudé Segniagbeto, G.; Auliya, M. (2020). Betting the farm: A review of Ball Python and other reptile trade from Togo, West Africa. *NC*, 40, 65–91, doi:10.3897/natureconservation.40.48046.
82. Bennett, D. & Sweet, S.S. (2010). *Varanus exanthematicus*. The IUCN Red List of Threatened Species 2010: e.T178346A7527972. [dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T178346A7527972.en](https://doi.org/10.2305/IUCN.UK.2010-4.RLTS.T178346A7527972.en).
83. Bennett, D. & Sweet, S.S. (2010). *Varanus exanthematicus*. The IUCN Red List of Threatened Species 2010: e.T178346A7527972. [dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T178346A7527972.en](https://doi.org/10.2305/IUCN.UK.2010-4.RLTS.T178346A7527972.en).
84. Bennett, D., & Thakoordyal, R. (2003). The Savannah Monitor Lizard: The Truth about *Varanus exanthematicus*. Viper Press.
85. Mendyk, R. W., Augustine, Lauren, & Baumer, Megan. (2014). On the thermal husbandry of monitor lizards. *Herpetological Review*, 45(4), 619-632.
86. Petrozzi, F., Luiselli, L., Hema, E.M., Diagne, T., Segniagbeto, G.H., Eniang, E.A., Leuteritz, T.E.J. & Rhodin, A.G.J. (2021). *Centrochelys sulcata*. The IUCN Red List of Threatened Species 2021: e.T163423A1006958. [dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en](https://doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en).
87. Branch, B. (2008) *Tortoises, Terrapins and Turtles of Africa*. New Holland Publishing, Cape Town, South Africa.
88. Petrozzi, F., Luiselli, L., Hema, E.M., Diagne, T., Segniagbeto, G.H., Eniang, E.A., Leuteritz, T.E.J. & Rhodin, A.G.J. (2021). *Centrochelys sulcata*. The IUCN Red List of Threatened Species 2021: e.T163423A1006958. [dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en](https://doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en).
89. Petrozzi, F., Luiselli, L., Hema, E.M., Diagne, T., Segniagbeto, G.H., Eniang, E.A., Leuteritz, T.E.J. & Rhodin, A.G.J. (2021). *Centrochelys sulcata*. The IUCN Red List of Threatened Species 2021: e.T163423A1006958. [dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en](https://doi.org/10.2305/IUCN.UK.2021-1.RLTS.T163423A1006958.en).
90. Buhlmann, K. A. et al., (2008). Conservation biology of freshwater turtles and tortoises : a compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. portals.iucn.org/library/sites/library/files/styles/publication/public/book_covers/BC-Chelonian-Research-Monographs.jpg
91. Diaz, S.; Settele, J.; Brondizio, E.S.; Ngo, H.T.; Agard, J.; Arneeth, A.; Balvanera, P.; Brauman, K.A.; Butchart, S.H.M.; Chan, K.M.A.; et al. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science*, 366, eaax3100, doi:10.1126/science.aax3100.
92. Smith, K.F.; Behrens, M.; Schloegel, L.M.; Marano, N.; Burgiel, S.; Daszak, P. (2009). Reducing the Risks of the Wildlife Trade. *Science*, 324, 594–595, doi:10.1126/science.1174460.
93. Kindswater, H.K.; Duly, N.K.; Horswill, C.; Juan-Jordá, M.-J.; Mangel, M.; Matthiopoulos, J. (2018). Overcoming the Data Crisis in Biodiversity Conservation. *Trends in Ecology & Evolution*, 33, 676–688, doi:10.1016/j.tree.2018.06.004.
94. Conde, D.A.; Staerk, J.; Colchero, F.; da Silva, R.; Schöley, J.; Baden, H.M.; Jouvet, L.; Fa, J.E.; Syed, H.; Jongejans, E.; et al. (2019). Data gaps and opportunities for comparative and conservation biology. *Proc Natl Acad Sci USA*, 116, 9658–9664, doi:10.1073/pnas.1816367116.
95. Frank, E.G.; Wilcove, D.S. Long delays in banning trade in threatened species. *Science* 2019, 363, 686–688, doi:10.1126/science.aav4013.
96. Marshall, B.M.; Strine, C.; Hughes, A.C. (2020). Thousands of reptile species threatened by under-regulated global trade. *Nat Commun*, 11, 4738, doi:10.1038/s41467-020-18523-4.
97. Auliya, M.; Hofmann, S.; Segniagbeto, G.H.; Assou, D.; Ronfot, D.; Astrin, J.J.; Forat, S.; Koffivi K. Ketoh, G.; D’Cruze, N. (2020). The first genetic assessment of wild and farmed ball pythons (Reptilia, Serpentes, Pythonidae) in southern Togo. *NC*, 38, 37–59, doi:10.3897/natureconservation.38.49478.
98. Baker, P.J., Luiselli, L. & Diagne, T. (2016). *Cyclanorbis elegans*. The IUCN Red List of Threatened Species 2016: e.T6004A3086539. [dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T6004A3086539.en](https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T6004A3086539.en).
99. Global Invasive Species Database (2021). iucngisd.org/gisd/speciesname/Trachemys+scripta+elegans [Accessed 12 June 2021].
100. Wagner, P., Trape, J.-F., Segniagbeto, G., Niagate, B., Spawls, S., Malonza, P.K., Beraducci, J. & Baha El Din, S. (2020). *Trachylepis quinqueaeniata*. The IUCN Red List of Threatened Species 2020: e.T198523A2529469. [dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T198523A2529469.en](https://doi.org/10.2305/IUCN.UK.2020-3.RLTS.T198523A2529469.en).
101. Do Linh San, E., Angelici, F.M., Maddock, A.H., Baker, C.M. & Ray, J. (2015). *Atilax paludinosus*. The IUCN Red List of Threatened Species 2015: e.T41590A45204865. [dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T41590A45204865.en](https://doi.org/10.2305/IUCN.UK.2015-4.RLTS.T41590A45204865.en).
102. Vitt, L.J. & Caldwell, J.P. (2009). *Herpetology*. 3rd Ed., Academic Press publications, 803 Burlington, U.S.A., 697 pp.
103. World Animal Protection (2020) Ball pythons are wildlife #NotPets Documentary. [youtube.com/watch?v=IRIA80twB6E](https://www.youtube.com/watch?v=IRIA80twB6E)
104. World Animal Protection. (2020b) Suffering in silence. Uncovering the cruelty of the global trade in Ball pythons. worldanimalprotection.org.uk/campaigns/animals-wild/ball-python-documentary [Accessed 12 June 2021].
105. Matsuda Goodwin, R., Segniagbeto, G., Nobimè, G. & Imong, I. (2020). *Cercopithecus mona*. The IUCN Red List of Threatened Species 2020: e.T4222A17946672. [dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T4222A17946672.en](https://doi.org/10.2305/IUCN.UK.2020-2.RLTS.T4222A17946672.en).
106. Karesh, W.B.; Cook, R.A.; Bennett, E.L.; Newcomb, J. (2005). Wildlife Trade and Global Disease Emergence. *Emerg. Infect. Dis.*, 11, 1000–1002, doi:10.3201/eid1107.050194.
107. Jones, K.E.; Patel, N.G.; Levy, M.A.; Storeygard, A.; Balk, D.; Gittleman, J.L.; Daszak, P. (2008). Global trends in emerging infectious diseases. *Nature*, 451, 990–993, doi:10.1038/nature06536.
108. Zhou, P.; Yang, X.-L.; Wang, X.-G.; Hu, B.; Zhang, L.; Zhang, W.; Si, H.-R.; Zhu, Y.; Li, B.; Huang, C.-L.; et al. (2020) A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579, 270–273, doi:10.1038/s41586-020-2012-7.
109. Godoy, S.N.; Matushima, E.R. (2010). A Survey of Diseases in Passeriform Birds Obtained From Illegal Wildlife Trade in São Paulo City, Brazil. *Journal of Avian Medicine and Surgery*, 24, 199–209, doi:10.1647/2009-029.1.
110. WHO (2021). [who.int/news-room/fact-sheets/detail/zooonoses](https://www.who.int/news-room/fact-sheets/detail/zooonoses). [Accessed 14 June 2021].
111. Zi-Wei Ye et al., (2020). Zoonotic origins of human coronaviruses. ncbi.nlm.nih.gov/pmc/articles/PMC7098031/
112. Mari Saéz, A., Weiss, S., Nowak, K., Lapeyre, V., Zimmermann, F., Düx, A., ... & Leendertz, F. H. (2015). Investigating the zoonotic origin of the West African Ebola epidemic. *EMBO molecular medicine*, 7(1), 17-23. doi.org/10.15252/emmm.201404792
113. Mendoza-Roldan, J. A., Mendoza-Roldan, M. A., & Otranto, D. (2021). Reptile vector-borne diseases of zoonotic concern. *International Journal for Parasitology: Parasites and Wildlife*.
114. Watsa, M. (2020). Wildlife Disease Surveillance Focus Group Rigorous wildlife disease surveillance. *Science*, 369, 145–147, doi:10.1126/science.abc0017.

115. Karesh, W.B.; Cook, R.A.; Bennett, E.L.; Newcomb, J. (2005). Wildlife Trade and Global Disease Emergence. *Emerg. Infect. Dis.*, 11, 1000–1002, doi:10.3201/eid1107.050194.
116. Wicker, L. V., Canfield, P. J., & Higgins, D. P. (2017). Potential pathogens reported in species of the family Viverridae and their implications for human and animal health. *Zoonoses and public health*, 64(2), 75-93. doi.org/10.1111/zph.12290
117. Kruzer (2020). thesprucepets.com/pet-genets-1239556 [Accessed 14 June 2021].
118. Smith (2021). pethelpful.com/exotic-pets/genetcare. [Accessed 14 June 2021].
119. To come
120. Lam et al., (2004). Severe Acute Respiratory Syndrome: Clinical and Laboratory Manifestations. ncbi.nlm.nih.gov/pmc/articles/PMC1904416/
121. Mari Saéz, A., Weiss, S., Nowak, K., Lapeyre, V., Zimmermann, F., Düx, A., ... & Leendertz, F. H. (2015). Investigating the zoonotic origin of the West African Ebola epidemic. *EMBO molecular medicine*, 7(1), 17-23. doi.org/10.15252/emmm.201404792
122. OIE (2021). oie.int/en/what-we-offer/emergency-and-resilience/covid-19/ [Accessed 14 June 2021].
123. OIE (2021). oie.int/en/what-we-offer/emergency-and-resilience/covid-19/ [Accessed 14 June 2021].
124. OIE (2021). oie.int/en/what-we-offer/emergency-and-resilience/covid-19/ [Accessed 14 June 2021].
125. Marin, C., Lorenzo-Rebenaque, L., Laso, O., Villora-Gonzalez, J., & Vega, S. (2021). Pet reptiles: a potential source of transmission of multidrug-resistant Salmonella. *Frontiers in Veterinary Science*, 7, 1157.
126. D’Cruze, N., Bates, J., Assou, D., Ronfot, D., Coulthard, E., Segniagbeto, G. H., ... & Rowntree, J. (2020b). A preliminary assessment of bacteria in “ranché” ball pythons (*Python regius*), Togo, West Africa. *Nature Conservation*, 39, 73-86.
127. Rosen and Smith (2010). Summarizing the Evidence on the International Trade in Illegal Wildlife. springer.com/article/10.1007/s10393-010-0317-y
128. Jörn et al., (2009). Polly can make you sick: pet bird-associated diseases. pubmed.ncbi.nlm.nih.gov/19339639/
129. CDC (2021). Reptiles and Amphibians; Center for Disease Control and Prevention: Atlanta, GA, USA. cdc.gov/healthypets/pets/reptiles.html [Accessed 14 June 2021].
130. Broad, S.; Mulliken, T.; Roe, D. (2003). The nature and extent of legal and illegal trade in wildlife. *The trade in wildlife: regulation for conservation*.
131. Lockwood, J.L.; Welbourne, D.J.; Romagosa, C.M.; Cassey, P.; Mandrak, N.E.; Strecker, A.; Leung, B.; Stringham, O.C.; Udell, B.; Episcopio-Sturgeon, D.J.; et al. (2019). When pets become pests: the role of the exotic pet trade in producing invasive vertebrate animals. *Front Ecol Environ*, fee.2059, doi:10.1002/fee.2059.
132. Lockwood, J.L.; Welbourne, D.J.; Romagosa, C.M.; Cassey, P.; Mandrak, N.E.; Strecker, A.; Leung, B.; Stringham, O.C.; Udell, B.; Episcopio-Sturgeon, D.J.; et al. (2019). When pets become pests: the role of the exotic pet trade in producing invasive vertebrate animals. *Front Ecol Environ*, fee.2059, doi:10.1002/fee.2059.
133. Symes, W.S.; McGrath, F.L.; Rao, M.; Carrasco, L.R. (2018). The gravity of wildlife trade. *Biological Conservation*, 218, 268–276, doi:10.1016/j.biocon.2017.11.007.
134. Harfoot, M.; Glaser, S.A.M.; Tittensor, D.P.; Britten, G.L.; McLardy, C.; Malsch, K.; Burgess, N.D. (2018). Unveiling the patterns and trends in 40 years of global trade in CITES-listed wildlife. *Biological Conservation*, 223, 47–57, doi:10.1016/j.biocon.2018.04.017.
135. Livingstone, E.; Shepherd, C.R. (2016). Bear farms in Lao PDR expand illegally and fail to conserve wild bears. *Oryx*, 50, 176–184, doi:10.1017/S0030605314000477.
136. Carpenter, A.I.; Robson, O.; Rowcliffe, J.M.; Watkinson, A.R. (2005). The impacts of international and national governance changes on a traded resource: a case study of Madagascar and its chameleon trade. *Biological Conservation*, 123, 279–287, doi:10.1016/j.biocon.2004.11.015.
137. Smith, K. M., Machalaba, C. M., Jones, H., Caceres, P., Popovic, M., Olival, K. J., ... & Karesh, W. B. (2017). Wildlife hosts for OIE-listed diseases: considerations regarding global wildlife trade and host-pathogen relationships. *Veterinary medicine and science*, 3(2), 71-81.
138. Species+ (2021). The 10 largest airlines in Africa. speciesplus.net/species#/taxon_concepts/8543/legal [Accessed 14 June 2021].
139. Species+ (2021). The 10 largest airlines in Africa. speciesplus.net/species#/taxon_concepts/8543/legal [Accessed 14 June 2021].
140. Robin des Bois (2021). Record Turtle Seizure in Burkina Faso. robendesbois.org/en/saisie-record-de-tortues-au-burkina-faso/ [Accessed 15 June 2021].
141. Wicker, L. V., Canfield, P. J., & Higgins, D. P. (2017). Potential pathogens reported in species of the family Viverridae and their implications for human and animal health. *Zoonoses and public health*, 64(2), 75-93. doi.org/10.1111/zph.12290
142. Robin des Bois (2021). Record Turtle Seizure in Burkina Faso. robendesbois.org/en/saisie-record-de-tortues-au-burkina-faso/ [Accessed 15 June 2021].
143. Ethiopian Airlines (2021). ethiopiancargo.azurewebsites.net/index/ethiopian-marks-one-year-since-the-first-preighter-operation-on-passenger-aircraft [Accessed 14 June 2021].
144. WHO (2021b). WHO Coronavirus Dashboard. covid19.who.int/ [Accessed 15 June 2021].
145. World Animal Protection (2019b). Turkish Airlines gets on board to protect African grey parrots, thanks to 188,099 of you. www.worldanimalprotection.org/news/turkish-airlines-gets-board-protect-african-grey-parrots-thanks-188099-you [Accessed 14 June 2021].

All of the images in this report are of wild animal species that were advertised publicly via social media accounts (Facebook) of wildlife exporters operating in West Africa and are representative of the husbandry and export conditions therein

World Animal Protection


5th Floor


222 Grays Inn Road

London WC1X 8HB

UK

 +44 (0)20 7239 0500

 info@worldanimalprotection.org

 W: worldanimalprotection.org

 [/WorldAnimalProtectionInt](https://www.facebook.com/WorldAnimalProtectionInt)

 [/world_animal_protection](https://www.instagram.com/world_animal_protection)

 [/MoveTheWorld](https://twitter.com/MoveTheWorld)

 [/animalprotection](https://www.youtube.com/channel/UC...)

Copyright © World Animal Protection

08.21