

Protecting Wildlife to Prevent Future Pandemics

The emergence of new and deadly zoonotic infectious diseases is inextricably linked to human exploitation of natural resources. Unsustainable habitat destruction and the global wildlife trade – both legal and illegal – have resulted in staggering declines in the abundance and diversity of species, as well as increased interaction between humans and animals, creating myriad opportunities for pathogen transmission. To prevent the next pandemic, we must significantly alter our relationship with the natural world.

Scope of Biodiversity Decline

Human activity severely impacts the natural world, including the survival of wildlife species. Three-quarters of all land on Earth is now significantly affected by humans, and the primary drivers of biodiversity decline include human-driven habitat destruction, climate change, killing wildlife for food, chemical pollution, and the wildlife trade.ⁱ

- 1 million species worldwide are currently at risk of extinction, many within the next few decades.ⁱⁱ
- Vertebrate extinction is occurring at a rate up to 100 times greater than what would be considered normal,ⁱⁱⁱ and is accelerating.
- Nearly one-third of species are shrinking in population numbers and territorial ranges,^{iv} and wildlife population sizes have decreased by at least 60 percent globally since 1970.^v
- In the course of human history, people have eradicated 83 percent of all mammals.^{vi}
- The number of birds in the United States and Canada has declined by 3 billion, or 29 percent, over the past half-century.^{vii}
- More than 40 percent of amphibian species and more than a third of all marine mammals are threatened with extinction.^{viii}



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Role of Wildlife Trade

Wildlife trade, defined as the legal or illegal commerce in living or dead species, is a significant driver of declines in global biodiversity. Not only does trade have direct negative impacts on in-demand wildlife, but the loss or decline of exploited species can create a domino effect that impairs ecosystem functions to the detriment of wildlife and humans alike.

Live wild animals are traded domestically and internationally as pets, for use in laboratories, as food, and for zoos. Dead animals and their parts are traded for food, traditional medicines, trinkets, trophies, clothing, and other uses. A significant proportion of this multi-billion dollar industry is legal and unregulated.

Wildlife trade is accelerating due to several factors. Globalization has expanded all types of trade, and the internet and social media have given sellers unprecedented access to buyers. Additionally, increasing affluence in many regions where animals are traditionally in demand has increased desire for and ability to purchase wild animals or wildlife products.

Approximately 18 percent (nearly 5,600 species) of the planet's known terrestrial vertebrates are part of this trade, and an additional 3,000 plus species are at risk of entering the market.^{ix} At least 958 species listed as "at risk" by the International Union for Conservation of Nature (IUCN) are imperiled by international trade.^x

The U.S. is one of the world's top importers of wildlife, responsible for an estimated 20 percent of the global wildlife market.^{xi} Over 5.2 million wildlife or wildlife product shipments, including over 11 billion individual specimens, were imported into the U.S. between 2000 and mid-2013. Of these, over 3 billion individuals were live upon entry. During this time period, the number of annually declared wildlife shipments doubled, reaching approximately 400,000 declared shipments imported in 2012.^{xii}

How Exploitation of Wildlife is Linked to Zoonotic Diseases

Zoonotic diseases are defined as pathogens transmissible between animals and humans. Approximately one quarter of deaths worldwide are caused by infectious diseases. Of these diseases, 60 percent are considered zoonotic, and more than 70 percent of these originate with wildlife.^{xiii}

Incidents of emerging zoonotic diseases have increased significantly since 1940,^{xiv} a trend which strongly correlates with accelerating exploitation of natural resources and precipitous declines in biodiversity. These patterns of exploitation, including the wildlife trade, have brought humans into much closer contact with wildlife, increasing the risk of pathogen transmission.



Wolf Clifton - Animal People, Inc.

In just the past 40 years, the worst pandemics and epidemics have all originated with the trade and consumption of animals amid the destruction of their habitat:

- The 2002-2003 SARS pandemic, which resulted in 774 deaths, was traced back to a live-animal market in Guangdong, China. Experts believe the virus originated in horseshoe bats, and was transmitted via an intermediary, likely masked palm civets being sold in the market for their meat.^{xv}
- The first reported outbreak of Ebola occurred in 1976, but it seems the virus existed long before that. African fruit bats are suspected as the source animal. People were likely infected as they encroached upon forested areas and consumed bushmeat.^{xvi} The worst outbreak, in 2014-16, resulted in 11,325 deaths.^{xvii}
- The origin of the human AIDS pandemic was transmission of HIV from chimpanzees to humans in southeastern Cameroon. This devastating zoonotic disease has infected at least 60 million people and caused more than 25 million deaths.^{xviii}
- Humans have experienced several outbreaks of avian influenza, an umbrella term for several different strains of the influenza A virus. All the strains have been found in wild water birds, and several have also spread to poultry, increasing the risk of human exposure.^{xix}
- Swine influenza, or H1N1, emerged in 2009, and is believed to have originated from interaction between influenza viruses circulating in North American pig herds and Eurasian pig herds.^{xx}
- Zika virus was first identified in monkeys in Uganda in 1947, and first recorded in humans in 1952.^{xxi} It is spread by mosquitos, which are becoming more prevalent as natural predators (such as amphibians) decline.

The animal-human nexus of these zoonotic diseases is not limited to other nations. In 2003, the United States monkeypox outbreak was the result of importing African giant pouched rats, dormice, and rope squirrels from Africa. These rodents transmitted the virus to prairie dogs, who in turn were sold as pets and transmitted the virus to people.^{xxii}

Experts believe that the current outbreak of COVID-19 originated at a market where live, wild animals are sold and slaughtered in Wuhan, China. It is considered likely that the virus originated with a bat and may have been transmitted to humans through another intermediate species.^{xxiii}

The Solution

The COVID-19 pandemic is a tragic reminder that our treatment of the natural world has severe ramifications. Unless we curtail the rate of environmental decline due to human activity, it is inevitable that global pandemics will continue to emerge at an escalating rate. The solution is clear: we must curb wildlife exploitation to reduce disease risk. Protecting nature is more important now than ever, and it is time for the United States to become a global leader in addressing habitat loss and wildlife trade.

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- i https://www.wwf.org.uk/sites/default/files/2018-10/wwfintl_livingplanet_full.pdf
- ii <https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>
- iii <https://advances.sciencemag.org/content/advances/1/5/e1400253.full.pdf>
- iv <https://www.pnas.org/content/pnas/115/25/6506.full.pdf>
- v https://www.wwf.org.uk/sites/default/files/2018-10/wwfintl_livingplanet_full.pdf
- vi <https://www.pnas.org/content/pnas/115/25/6506.full.pdf>
- vii <https://science.sciencemag.org/content/366/6461/120>
- viii <https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>
- ix <https://science.sciencemag.org/cgi/doi/10.1126/science.aav5327>
- x <https://science.sciencemag.org/content/363/6428/686>
- xi https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5357285/pdf/10393_2017_Article_1211.pdf
- xii <https://link.springer.com/article/10.1007/s10393-017-1211-7>
- xiii <https://www.nature.com/articles/nature06536.pdf>
- xiv <https://www.nature.com/articles/nature06536.pdf>
- xv https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120088/pdf/978-3-540-70962-6_Chapter_13.pdf
- xvi <https://www.cdc.gov/vhf/ebola/history/summaries.html>
- xvii <https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/index.html>
- xviii <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3234451/pdf/cshperspectmed-HIV-a006841.pdf>
- xix <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.393.122&rep=rep1&type=pdf>
- xx https://www.cdc.gov/h1n1flu/information_h1n1_virus_qa.htm
- xxi https://www.who.int/bulletin/online_first/16-171082/en/
- xxii <https://www.cdc.gov/poxvirus/monkeypox/outbreak.html>
- xxiii <https://www.sciencedirect.com/science/article/pii/S0896841120300469>