EcoHealth Alliance

Senate Committee on Environment and Public Works

Senate Hearing on
"Stopping the Spread: Examining the Increased Risk of Zoonotic Disease from Illegal Wildlife Trafficking"

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Introduction

Good morning. My name is Dr Jonathan Epstein from EcoHealth Alliance. Thank you Chairman Barrasso and Ranking Member Carper for inviting me to speak before this committee on the important issue of the wildlife trade and trafficking as a cause of epidemics. Today I plan to speak about how viruses emerge from wildlife to cause epidemics in people and how the wildlife trade and trafficking play a role in disease emergence. My testimony will be in three parts and will include a review of the science behind zoonotic disease emergence – diseases that originate in animals and jump into human populations; giving examples of recent epidemics caused by animal viruses. The second part will describe how the wildlife trade and trafficking, both locally and globally, can increase the risk of viruses jumping from animal hosts into people and causing epidemics. In the third part of my testimony I'll review some of the agencies that work on wildlife disease surveillance, and discuss the important role that US Fish and Wildlife Service can play in preventing epidemics both domestically and internationally. I'll discuss gaps that have been identified with respect to the United States' capacity to screen imported wildlife for zoonotic diseases and some ideas for how the US Fish and Wildlife Service may play a greater role in preventing pandemics internationally as it works with partner countries to combat wildlife trafficking.

Part One: The emergence of zoonotic diseases from wildlife

More than half of known human diseases are zoonotic, meaning that they are caused by viruses, bacteria, or other disease-causing micro-organisms ("pathogens") that occur naturally in animals. There are many examples of significant zoonotic pathogens that have led to large scale epidemics or global pandemics. Among them are HIV, which originated in chimpanzees and other primates; pandemic influenza viruses (1918, 2009) which originated in migratory waterfowl; SARS coronavirus, which comes from bats, and Ebola virus, also believed to come from bats (1). Some epidemics are caused by zoonotic bacteria, such as Plague, which is carried by rodents. In addition to threatening human health, many of these pathogens can also infect other animals causing disease and death, threatening endangered wildlife species and livestock which are vital for human livelihood. Diseases that are newly recognized, that have recently jumped from native animal hosts to livestock or people, or that have expanded their geographic range are referred to as "emerging" diseases. These tend to be caused by viruses, but may also include bacteria such as antimicrobial resistant bacteria. 75% of emerging diseases are zoonotic, and the majority of these come from wildlife, including the viruses mentioned above(2). In most cases, we do not have drugs or vaccines readily available to protect us from emerging diseases, and so our best tool for protecting human and livestock populations from emerging zoonotic pathogens is preventing transmission from wildlife in the first place.

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Zoonotic diseases emerge through human activities that increase human or domestic animal contact with wildlife. Land-use change (e.g. deforestation, agricultural land expansion) is the most significant among the various drivers of disease emergence that have been identified, causing about 30% of emerging diseases (3). Other drivers include intensive livestock farming where domestic and wild animals comingle, bushmeat hunting, wildlife trade (e.g. extracting animals from the wild to supply markets) and global travel. With increased contact among people, domestic animals (e.g. cattle, poultry, goats, etc…) and wildlife, there is increased opportunity for viruses to jump from one species to another, a process called “spillover.” Given the right type of virus, it may then cause disease in the new hosts in infects, and potentially spread among animals or people. If a virus is able to be transmitted from person to person, local community spread occurs. Human mobility and connectivity then allows new populations to be infected and can lead to larger epidemics. International travel has connected the world more than ever before, which allows local epidemics to quickly become global pandemics (4). Examples of emerging viruses and the human activities that allows spillover to occur include: HIV, which jumped from chimpanzees and other non-human primates through hunting and butchering, which exposed people to bodily fluids from animals; Nipah virus, which jumped from fruit bats to pigs and then to people in Malaysia via intensive pig farming and the presence of orchards on farms which attracted bats and allowed pigs to eat dropped fruit contaminated with bat excreta. SARS coronavirus emerged through the wildlife trade in southern China as live bats, civets, and other mammals were brought into large urban markets and butchered, exposing vendors to bodily fluids of infected animals (1).

Human demography and wildlife biodiversity are strong predictors of disease emergence, and there are specific geographies that have been identified as high risk for disease emergence, termed “EID hotspots,” based on these and other factors including climate and latitude. **Figure 1** shows a map of global EID hotspots, places where zoonotic disease outbreaks are most likely to occur in the future. Because they tend to be rich in biodiversity, many EID hotspots are also hotspots for wildlife trade and trafficking.

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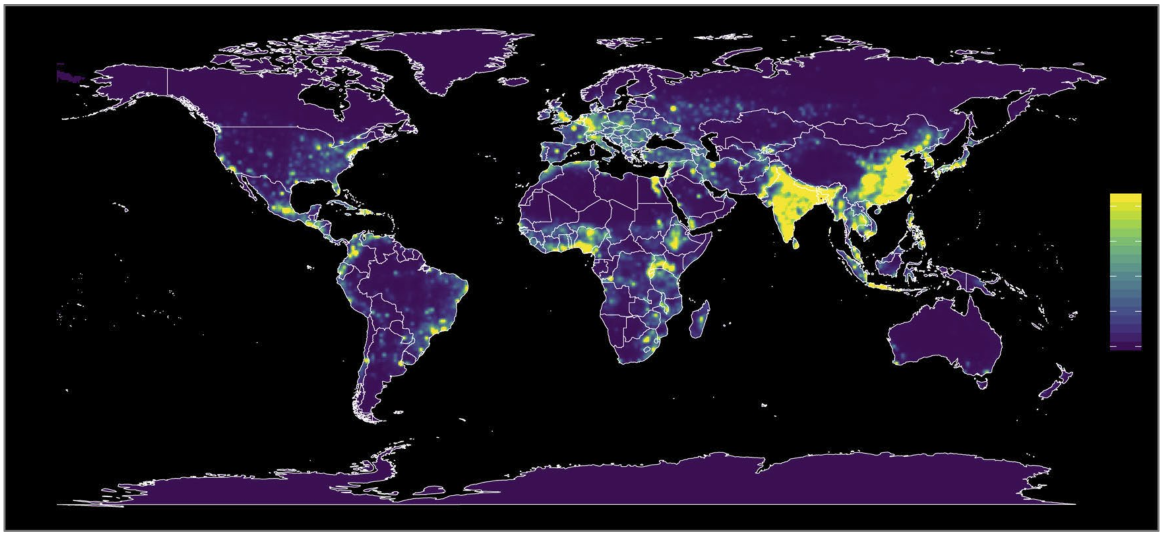

Figure 1. Map of predicted hostpots for emerging zoonotic diseases (from Allen et al., *Nat. Comm*. 2017)

Part Two: Wildlife trade and trafficking drives zoonotic disease emergence.

The wildlife trade and trafficking are drivers of zoonotic disease emergence. Wildlife trade is a broad term that includes several ways in which people utilize wildlife. Generally, people utilize wildlife for food, clothing, pets, ornaments, and medicine (5). The extent to which people use wildlife varies by geography and culture. Hunting wildlife for food occurs around the world, including the United States, and wildlife hunting can be for subsistence or done on a more commercial scale to supply local, regional, or international markets. The value chain, or the process by which animals are removed from wild populations and transported as a commodity within a market system, can serve as an amplifier of risk for disease emergence.

The global wildlife trade is massive, complex, and includes nearly every country in the world (6). It consists of live animals and animal parts that are sold for food (e.g. bushmeat), medicinal purposes, ornamental purposes, and pets. Wildlife trade and trafficking threatens both conservation and human health (7, 8). Whether legal or illegal, the process of harvesting animals from natural habitats and transporting them around the world can create risk of disease transmission. China and the United States are the world's biggest consumers of wildlife, with China primarily using wildlife for food and traditional medicine while the US imports are driven by commercial uses including the exotic pet trade (5). The global wildlife trade is composed of both legal and illegal elements, the latter of which represents tens of billions of dollars and is often conducted by organized criminal entities (6). An analysis of legally imported wildlife into the United States between 2000 and 2005 using the US Fish and Wildlife's Law Enforcement Management Information System (LEMIS) database, found that many mammals known carry zoonotic viruses and bacteria were imported for commercial purposes, including various primate and rodent species (9). The legal importation of macaques from the Philippines for biomedical use in 1990 introduced Ebola virus (now called "Reston ebolavirus") into the United States (10).

We are just beginning to understand the extent to which various wildlife species may carry zoonotic viruses, and in general, we are only aware of about 1% of the predicted total viruses that exist in nature (11). Each species of animal has its own particular microbial flora, which includes bacteria and viruses. Most of these are benign, or beneficial to the animal – the result of evolutionary relationships between host and microbe. A small proportion of viruses may have the ability to infect other animal or human hosts, and cause disease. This pool of zoonotic viruses in wildlife has yet to be fully studied, though efforts to do so such as the US Agency for International Development's PREDICT project, which discovered more than 900 novel viruses in wildlife across 25 countries, including from illegally trafficked animals, have improved our understanding of the diversity of viruses carried by animals considered to be important hosts, such as bats, rodents, and nonhuman primates; as well as what types of activities and environments promote opportunities for viral spillover.

At a local scale, the capture of wild animals involves one or more people handling and often butchering the animals, typically with minimal or no protection from injury or exposure to infectious agents. Infection by zoonotic viruses can occur from bites or scratches (e.g. rabies) or through exposure to bodily fluids via the nose, mouth, eyes, or cuts on the skin. The transportation of animals in cages or other containers, often under stressful and unsanitary conditions, can lead to increased transmission of viruses among animals and may provide opportunity for viruses to jump into new hosts - a process that may force a virus to mutate more rapidly and potentially adapt to the new host. Live animal markets may create conditions that further promote animal-to-animal and animal-to-human (e.g. zoonotic) transmission. Animals cages are often stacked on top of each other, and animals are handled and butchered by vendors, providing opportunity for viruses to spread among different animals and to the vendors themselves. These were the circumstances in the wetmarkets where SARS-CoV originally emerged in southern China.

Wildlife Trade in China

The use of wildlife for food and medicinal purposes has existed in Chinese culture for thousands of years (12). Wildlife is considered a natural resource to be used by society, and the commercialization of the wildlife trade, via large live animal markets and commercial sale of wildlife-based pharmaceutical products, led to an increase in the consumption of wildlife, largely in southern provinces and in Beijing (12). To meet consumer demand, wild animals, including protected and endangered species, are frequently sourced from other parts of Asia and Africa (12). Wildlife farming has also become an industry in China. The demand for rare and endangered species, which carry particular prestige when eaten or used in traditional medicine, drives unsustainable wildlife trafficking. Although legislation was introduced in 1988 under the Law on Wild Animal Protection, which specifically lists species that are illegal to trade based on their conservation status, enforcement has been weak, and endangered species continue to be found in markets (12). Live animal markets provide a mixture of legal and illegally traded wildlife, and legal markets may provide cover for illegal wildlife trafficking (6). Awareness of wildlife protection laws among consumers is limited, although there is a growing societal concern among Chinese citizens about animal welfare and conservation, and demand for wildlife as a source of food appears to be gradually waning (12).

SARS coronavirus is an example of a zoonotic virus that emerged through the wildlife trade in southern China. SARS was first detected in people working in urban live animal markets in Guangdong province, in November 2002. Early investigations showed that people who handled and sold animals in the markets and restaurants had a higher likelihood of being infected(13). This was the first indication that SARS coronavirus may have been zoonotic. The virus was subsequently detected in several species of mammals commonly found in markets, including ferret badgers, raccoon dogs, and civets (14). Vendors who sold civets, specifically, had a high rate of infection, and the virus was isolated from civets, suggesting that they may be the source of the virus. However, studies of civets on farms around Guangdong found that they were not infected, which suggested that civets were infected within the markets and were not the wildlife reservoir for the virus (15). Investigation of the natural reservoir for SARS-CoV by EcoHealth Alliance and collaborators led to the discovery in 2004 of coronaviruses closely related to SARS in four species of horseshoe bats, small cave-dwelling bats common across southern China (16). Since 2004, extensive and ongoing surveillance of coronaviruses in bats has led to the discovery of dozens of SARS-related coronaviruses horseshoe bats, some of which have the potential to infect people based on their use of the same receptor that SARS and SARS CoV-2 uses (the ACE-2 receptor) (17, 18). Data collected from bats globally suggests that they are the original reservoir for all mammalian coronaviruses, some of which continue to pose a threat to human health (19, 20). The diversity of SARS-related coronaviruses found in bats since the emergence of SARS-CoV, including Middle East Respiratory Syndrome coronavirus which emerged in Saudi Arabia in 2012, provided abundant evidence that there was a continuous risk that another zoonotic coronavirus could emerge from bats.

The potential role of wildlife trafficking in the emergence of SARS-CoV-2

The recognition of a cluster of 41 human pneumonia cases in Wuhan, China, in late December 2019 led to identification of a new coronavirus responsible for severe respiratory disease (21). The genomic sequence of the virus was about 80% similar to SARS CoV – different enough that it was a distinct virus, but close enough that it would be classified within the same group of beta-coronaviruses (22). It was called SARS-CoV-2 and its associated respiratory syndrome was named Coronavirus Infectious Disease 2019, or COVID-19. Early cases had been vendors or patrons of the Huanan Seafood Market in Wuhan, Hubei province, which led to the assumption that the virus had emerged in the market (21). However, some of the earliest known cases associated with the pneumonia cluster which were identified in early December, had not had any reported contact with the market, suggesting that they had been infected elsewhere (21). Analyses of the genomes of SARS-CoV-2 from patients and related coronaviruses from bats and other animals suggests that this virus may have begun circulating in humans as early as November, 2019, which is supported by epidemiologic evidence (23). Comparison of the viral genome to genetic sequences from archived bat samples by the Wuhan Institute of Virology found that SARS-CoV-2 was 96% genetically identical to a viral sequence that had been found in a Horseshoe bat collected in 2013 from Yunnan Province (22). This is the closest viral relative that has been found. While the Huanan market may have played a role in spreading the virus, it does not appear to be the origin of the outbreak, leaving open the question of how this virus emerged from a presumptive bat reservoir to humans. Based on the genetic differences between this and SARS-CoV-2, it is unlikely that this exact virus directly jumped into people to cause COVID-19. It is likely that a more closely related virus exists in bats, which may have directly infected humans or moved through other animal hosts before doing so.

There is currently no evidence pointing to any specific animal that may have been involved in the emergence of SARS-CoV-2, but it is capable of infecting a range of mammals, like SARS CoV, based on its use of the ACE-2 receptor. Cats, mink, ferrets, and nonhuman primates are all susceptible to infection by SARS-CoV-2 (24, 25). Civets, ferret badgers and raccoon dogs, as well as cats, are commonly found in wetmarkets in China and are potentially susceptible to infection by SARS-CoV-2 based on their known susceptibility to SARS-CoV. Pangolins are among the most trafficked animals in the world (6). Coronaviruses have been identified in Malayan pangolins which were confiscated in southern China, *en route* to wildlife markets. The pangolin coronavirus was overall more distantly related to SARS-CoV-2 than those in bats, except for a specific part of their genome which closely matched a gene sequence in SARS-CoV-2 (26, 27). The infected pangolins may have originated in Malaysia or elsewhere in Southeast Asia, but were sampled after days of being transported. By contrast, a recent study by our group of more than 300 pangolins confiscated at their point of origin in Malaysia, found no evidence of coronavirus infection (28). While it is unknown whether pangolins were involved in the evolution of SARS-CoV-2, it is possible that exchange of genetic material, a process called "recombination," between bat and pangolin coronaviruses occurred prior to infecting humans (29). Finding coronavirus infection downstream in the wildlife value chain suggests that wildlife trafficking can play a role in zoonotic disease transmission and emergence. In Viet Nam, coronavirus infection was found to be more frequent in mammals such as rodents and bats further along the wildlife value chain (e.g. in markets or on farms) compared to wild populations (30). More surveillance in wild bats, farmed animals and trafficked wildlife in and around china will be necessary to understand the extent to which wildlife markets may have contributed to its emergence.

While wildlife trade is a high-risk interface between wildlife and people and increases opportunity for viral spillover, it is important to note that it is not the only route by which wildlife viruses can emerge. There is evidence that exposure to bat-borne SARS-like coronaviruses has occurred within communities in Yunnan, China that lived in close proximity to a cave containing horseshoe bats known to be infected with a variety of SARS-related coronaviruses(31). Bats shed coronaviruses in their excreta, especially feces. People and other animals may be exposed to bat feces and coronaviruses in several contexts: through direct exposure to guano by entering caves, through food contamination (e.g. contamination of animal food or water on a farm) or through contact during hunting or transportation to markets. It's important that wildlife surveillance for zoonotic viruses take a One Health approach, concurrently screening animals and people across the entire value chain, from communities to transported wildlife, farms and markets, to better characterize the risk of spillover and emergence where wildlife trade occurs.

Risk of disease introduction to the United States through the wildlife trade and trafficking

Wildlife importation to supply the pet industry can also be a source of introduction of zoonotic viruses. In 2003, monkeypox virus was introduced to the United States via the importation of rodents from Ghana, where the virus is endemic and carried by rodents (32). Monkeypox virus, a disease which has a 10% case fatality rate, can be particularly serious in children. The rodents were imported legally by a pet wholesaler, and co-mingled with other rodents including prairie-dogs, which are native to North America. The prairie dogs became infected and subsequently caused an outbreak of monkeypox in 37 people, including a 6-year old girl who developed severe encephalitis (33). This was the first instance of a monkeypox outbreak in the western hemisphere, and is illustrative of the risks associated with importing exotic animals. In response to this outbreak, the US CDC imposed a ban on importation of African rodents without permits. While specific bans of known reservoirs for zoonotic pathogens may help manage the risk of a repeated introduction, they do not prevent rodents, in this case, or other animals being imported from other locations.

Bushmeat is illegally imported into the United States and Europe large quantities in and sold in black markets. International demand for bushmeat from Africa is driven by expat communities seeking to maintain traditional diets (5). Bushmeat often includes endangered or CITES protected species (e.g. chimpanzees, forest antelopes) which have been associated with zoonotic pathogens, including Ebola virus (34). In 2012, smuggled bushmeat from chimpanzees, other primates, rodents and warthogs originating in West Africa and confiscated at airports including JFK in New York, contained traces of zoonotic viruses including retroviruses and herpesviruses. The extent to which illegally trafficked live animals may introduce zoonotic pathogens to the US is difficult to determine given the paucity of data, however, these findings in bushmeat suggests that animal parts may also potentially be a source of zoonotic disease introduction (35). *Improved surveillance for pathogens in wildlife and bushmeat at US borders would improve our ability to asses risk and implement measures to further reduce risk of disease introduction into the United States.*

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Part Three: Opportunities for US Fish and Wildlife Service to engage with other US agencies in zoonotic disease surveillance in trafficked wildlife

Pre-border surveillance - screening animals that are part of the wildlife trade in their countries of origin, is critically important for understanding the risks involved in zoonotic disease emergence, as well as the risks associated with animal importation. US government investments in agencies and research programs that work with local governments in parts of the world that are particularly vulnerable to disease emergence through the wildlife trade and other means, can provide valuable insight and information necessary to assess risk, as well as to prepare for the next pandemic. The Convention on the Trade of Endangered Species (CITES) is the main international legislation that regulates the movement of animals. Unfortunately, it is insufficient to prevent disease emergence as it does not govern species that are not listed under CITES, nor does it govern the intra-national movement of animals. Targeted surveillance in wildlife that are part of the global wildlife trade is required at every stage, beginning with free-ranging populations and extending to wildlife farms, confiscated animals being smuggled, and animals legally being shipped at points of export.

A One Health approach to disease surveillance recognizes the connection among people, livestock and wildlife with respect to infectious disease and is useful for understanding the risk and frequency of disease emergence from wildlife. Implementation of a One Health framework requires that agencies in these three sectors engage in coordinated and cooperative surveillance activities to effectively assess and mitigate the risk of zoonotic disease emergence. There are relatively few national or inter-governmental organizations that focus on disease surveillance. The UN Food and Agriculture Organization and the World Organization for Animal Health each have specialist groups that focus on zoonotic pathogens in wildlife and domestic animals, but global surveillance activities are limited and tend to focus on a few priority diseases, rather than systemic strengthening to deal with unknown future emergence events or “Disease X.”

This presents an opportunity for the United States Government to examine its current human and animal surveillance systems, particularly related to wildlife trade and trafficking, to try to narrow gaps that allow for the emergence of zoonotic agents.

In 2010, a report by the Government Accountability Office to the Department of Homeland Security and Governmental Affairs, US Senate entitled “ LIVE ANIMAL IMPORTS: Agencies Need Better Collaboration to Reduce the Risk of Animal-Related Diseases” highlighted the roles of US agencies involved in disease surveillance, and gaps that existed among them when it came to screening imported wildlife for zoonotic pathogens (36).

The main findings of the report were that:

- *There was no single agency responsible for screening live animal imports for zoonotic agents;*
- The US Centers for Disease Control and Prevention established restrictions on wildlife imports only once a zoonotic virus had been identified in a specific species, but it did
- not set policy restricting wildlife species that had not yet been identified with specific pathogens of concern;
- The Department of the Interior's US Fish and Wildlife Service was generally engaged in preventing the importation of endangered or invasive wildlife species, but did not generally conduct testing for significant zoonotic or other important pathogens in imported wildlife;
- The US Department of Agriculture generally works to regulate domestic animal imports and its Animal and Plant Health Inspection Service (APHIS) prohibits the importation of animals or animal products that could contain agricultural pathogens (e.g. viruses, bacteria, parasites that threaten livestock health), but it does not screen wildlife for zoonotic pathogens;
- The report identified a need for better coordination among US agencies responsible for disease surveillance, including data sharing and private sector entities (e.g. NGOs and universities) that could help fill some of the gaps in surveillance;

Other agencies contributing to zoonotic disease surveillance in wildlife internationally include the Department of Defense, through its Cooperative Biological Threat Reduction program at the Defense Threat Reduction Agency which funds collaborative research and capacity building projects with local scientific institutions and governments to reduce the threat of high consequence zoonotic pathogens emerging. The USGS National Wildlife Health Center works with USFWS, the CDC and USDA to conduct wildlife disease research, some of which involved zoonotic pathogens such as avian influenza and plague. The National Institutes of Health (National Institute of Allergy and Infectious Diseases and the Fogarty International Center) and the National Science Foundation funds research related to understanding the epidemiology and ecology of emerging zoonoses, which may involve wildlife surveillance coupled with human studies.

In the years since this report became public, there have been incremental improvements in coordination among agencies. Examples of coordinated surveillance efforts between the US Fish and Wildlife Service and CDC, the USGS National Wildlife Health Center and USDA, as well as with NGOs and universities include surveillance for highly pathogenic avian influenza and the study of confiscated wildlife and bushmeat at US airports. However, there is still a need for a more comprehensive statutory framework that will establish consistent disease surveillance in imported wildlife, and policies based on current science related to groups of animals known to carry zoonotic pathogens. From a wildlife trafficking standpoint, by increasing USFWS's ability

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to support wildlife agencies in other countries who confiscate wildlife from the illegal trade and to test those animals for viruses or bacteria that may pose a threat, we can have a better understanding of the actual risk to health at different stages of the wildlife value chain as animals are captured, transported with other animals, and brought into a market systems where there is increased contact with people and domestic animals.

Beyond US border surveillance, conducting disease surveillance in wildlife in EID hotspot countries is vital to earl detection and response to emerging zoonoses. In 2009, the United States Agency for International Development launched the Emerging Pandemic Threats: PREDICT program. This program was led by a consortium of universities and NGOs, working with local governments and agencies in more than 25 EID hotspot countries, to build capacity to more rapidly detect and respond to outbreaks of novel zoonotic viruses(37). The program, which invested approximately $200 million over 10 years, was the largest One Health global surveillance project in history. It screened key wildlife groups (bats, rodents and primates) for novel viruses, while strengthening systems in ministries of environment (e.g. wildlife departments) to more effectively engage in disease surveillance and coordinate with health and livestock departments through coordinated surveillance activities. There is opportunity for USFWS to build on the strengths of the Emerging Pandemic Threats program, by engaging in wildlife surveillance both at the US border, and as part of its international engagements, on the frontlines of the wildlife trade.

Opportunities for the USFWS to help reduce the risk of zoonotic disease emergence

Wildlife trade and trafficking are significant drivers of zoonotic disease emergence, and the USFWS is in a position to be a leading agency in developing and implementing risk reduction strategies for spillover and emergence of zoonotic pathogens into human populations The following suggested actions are potential opportunities for USFWS to more effectively work towards reducing the risk of zoonotic disease emergence caused by wildlife trade and trafficking:

1) Conduct an internal review of resource needs to implement wildlife disease surveillance at-border and pre-border & to identify and remove barriers to more effective coordination with other US agencies;
2) Expand mandate to lead US agencies on border surveillance and pre-border disease surveillance;
3) Improve coordination with other US agencies responsible for disease surveillance in animals (e.g. USDA, USGS NWHC, and CDC);
4) Work with partner countries, particularly wildlife and anti-trafficking agencies, to develop and implement risk-reduction strategies for disease transmission related to wildlife trade and trafficking;

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   a. Use combinations of legislation, enforcement, and behavioral risk reduction in communities to reduce demand for wildlife, not just supply;
   b. Support community engagement to better understand behaviors and help provide alternatives to wildlife use;
5) Encourage regulated and monitored domestic breeding of exotic animals or wildlife – establish pathogen monitoring & health regulations;
6) Engage in public-private partnerships w NGOs and others to study zoonotic pathogens in trafficked animals and to develop sustainable, market-driven solutions;
7) Study the risk of live animal markets (wild and domestic animals) and the need to modernize food systems with refrigeration, food safety testing, etc…

There is still a need for a more comprehensive statutory framework that will establish consistent disease surveillance in imported wildlife, and policies based on current science related to groups of animals known to carry zoonotic pathogens. By providing increased resources and an expanded mandate to USFWS to hire epidemiologists, more veterinarians, and establish links with diagnostic laboratories, the US can establish stronger border and pre-border surveillance in wildlife. From a wildlife trafficking standpoint, by increasing USFWS's ability to support wildlife agencies in other countries who confiscate wildlife from the illegal trade and to test those animals for viruses or bacteria that may pose a threat to human and animal health, we can have a better understanding of the actual risk to health at different stages of the wildlife value chain as animals are captured, transported with other animals, and brought into a market systems where there is increased contact with people and domestic animals. By improving disease surveillance within the wildlife trade, USFWS can then develop and implement policies that will be more effective at preventing epidemics.

Part Four: Conclusion

Chairman Barrosso and Ranking Member Carper, thank you again for convening this hearing on a matter of critical importance both protecting and conserving biodiversity and to global health. I appreciate the opportunity to speak today on the topic of wildlife trafficking and zoonotic disease emergence. As we meet in the midst of one of the worst global pandemics in history, caused by a virus that likely originated in wildlife, it is a stark reminder of the complex challenges we face as a nation when it comes to protecting the health of Americans at home and around the world. There is no longer any separation between populations or countries when it comes to infectious disease. Outbreaks that happen anywhere in the world can affect anyone in the world – we are all connected. We have an opportunity to learn from a large body of scientific evidence that tells us that pandemic prevention requires effort on all fronts: human health, livestock health, and wildlife health. The US Fish and Wildlife Service should join the CDC and USDA as a health agency, and is in a position to help us reduce the risk of diseases emerging through wildlife trade and trafficking. I thank the Committee for strong bipartisan leadership on this matter.

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