

A Disaster Ignored?

The threat to human and animal health from imported exotic wildlife: a review of scientific evidence and opinion

May 2004

Vancouver Humane Society
303 – 8623 Granville Street
Vancouver, BC
V6P 5A2
Tel: 604 266 9744
Email: info@vancouverhumanesociety.bc.ca
www.vancouverhumanesociety.bc.ca

Executive Summary

A review of scientific evidence and opinion has found that the trade in wild and exotic animals could import infectious disease into Canada. * The review found:

- There has been a global rise in “emerging infectious diseases, 30 of which have appeared since 1976, according to the World Health Organization. More than two-thirds of these diseases have originated from animals.
- There is a strong consensus of scientific opinion that the international movement of animals through the global trade in wild and exotic species poses a significant threat of spreading infectious disease to humans and other animals, both domestic and wild. In addition, the movement of such “invasive species” is considered a threat to biodiversity.
- The legal and illegal trade in wildlife, including the pet trade, has been booming over the last decade and is worth billions of dollars.
- There has been considerable discussion internationally, especially in the United States, about the threat to public and veterinary health from imported wild and exotic animals, but apparently little discussion in Canada.
- Canadian defences against disease from imported wild and exotic animals may be weak in three areas:
 - The Canadian Food Inspection Agency (CFIA) does not regulate the importation of reptiles and amphibians or rodents under Canada’s Health of Animals Regulations, allowing the potential for these animals to enter the country carrying disease or disease vectors. This is despite new evidence that imported reptiles carry ticks that can transmit disease to domestic animals and substantial evidence that the trade in amphibians has spread disease to native amphibian species.
 - The CFIA operates a “species-specific” system for identifying animals that pose a disease threat. This reactive system relies on prior intelligence indicating that a specific type of animal may be a disease carrier. The system’s weakness was illustrated when Canada prohibited Gambian rats from entering the country *after* they caused an outbreak of Monkeypox in the United States in 2003. Before the outbreak became manifest, it would have been possible for the rats to enter Canada.
 - There is risk of infectious disease through the *illegal* importation of wildlife. Since 1999, the Canadian Wildlife Service has been reducing the number of inspections it carries out related to the illegal wildlife trade. A continued reduction in the number of inspections, especially in the face of a growing international illegal trade in wildlife, could increase this risk.

*Note: Animal protection agencies such as the Vancouver Humane Society have long addressed concerns about the trade in exotic animals on animal welfare grounds. The trade involves the inhumane treatment of animals in transport and captivity and damage to the habitats of many wild species, thus endangering their survival. This review describes the threat to native domestic and wild animals from the importation of alien species, although much of its focus relates to threats to human health. In carrying out research into the exotic animal trade it is impossible to ignore both the public health and veterinary health issues involved. Therefore the Vancouver Humane Society, in this review, has deemed it responsible and necessary to raise concerns over the risks to both animal *and* human health that the exotic wildlife trade represents.

A Disaster Ignored?

Introduction

On May 22, 2003 a four-year-old girl in Wisconsin visited her doctor with a high fever and sore throat after being bitten by her pet prairie dog. She was the first diagnosed case of Monkeypox in the Northern Hemisphere. Within weeks more than 30 other cases of the disease, typically found in central Africa, were reported across four states. The source of the outbreak was a shipment of Gambian rats, imported to the United States for sale as pets. They had infected prairie dogs, also for sale as pets, and thus introduced a completely unexpected, and potentially fatal, disease to North America.

The incident sparked a debate amongst American public health officials about the threat of imported zoonotic (animal to human) diseases. A similar discussion has taken place internationally, fueled by the appearance of “emerging infectious diseases” such as SARS, West Nile virus and avian flu. According to the World Health Organization (WHO), over the last decade more than two-thirds of emerging diseases have originated from animals. The discussion has widened to examine the threat to native animal health from imported disease and the ecological impact of “invasive species”.

WHO, and other authorities, have pointed to the increase in mass population movements, the growth in international travel and the transportation of live animals as some of the key reasons for emerging infectious diseases. A number of medical and public health bodies have cited the global pet and wildlife trade as a source of disease, which threatens both human and animal health. In July 2003, the medical journal *The Lancet* described the wild animal trade as “a disaster ignored” and called for the practice of taking animals from the wild to “swiftly be brought to an end.”

This report reviews evidence and scientific opinion on the link between the wild animal trade and the importation of infectious disease. It also examines the current Canadian regulatory and enforcement systems in place to guard against such disease.

Animal protection agencies have long argued that the trade in exotic animals compromises their welfare and threatens the survival of many species in their natural habitat. They have also pointed out the dangers of exotic animal ownership, including risks to health.

The Vancouver Humane Society has contributed to the efforts of several local authorities in establishing bylaws to prohibit the sale or ownership of exotic species, chiefly on animal welfare grounds. However, alongside concerns over animal welfare, these municipalities have shown considerable interest in the public and veterinary health risks associated with such animals. Now, in light of the rapidly growing body of evidence of

such risks, it is timely to shed more light on the exotic animal trade, its links with imported disease and the systems currently in place to prevent such importation.

Emerging infectious Diseases

In recent years scientists and public health officials across the world have observed a rise in “emerging infectious diseases.” Alarming outbreaks of these diseases have hit the headlines and become household words in many places, as public health and veterinary medical authorities struggle to cope with these unforeseen threats to human and animal health. According to the WHO, more than 30 such diseases have emerged since 1976. The most familiar include:

SARS (Severe Acute Respiratory Syndrome) – SARS appeared suddenly in April 2003 and by July of the same year 8,439 cases had been reported, with 812 deaths worldwide.¹ A viral respiratory illness caused by a coronavirus, SARS is widely thought to have originated in animals, possibly in Chinese wild animal markets.

Monkeypox – A viral disease endemic to central and western Africa, monkeypox appeared in the United States in May 2003 and infected more than 30 people. Although potentially fatal the disease caused no deaths, but victims suffered fever, headache, muscle aches, swollen lymph nodes and lesions. The outbreak was traced to Gambian rats imported to the US for sale as pets.

West Nile Virus (WNV) – WNV is a type of virus that causes encephalitis, or inflammation of the brain. Mosquitoes become infected with the virus when they feed on infected birds, which can carry the virus in their blood. Mosquitoes can then transmit WNV to humans and animals when biting. In Canada, the virus was first confirmed in birds in Ontario in 2001 and the first human case of WNV was confirmed in Ontario in September 2002. In 2003 there were human cases in five provinces and 10 people died, according to Health Canada. Researchers have speculated that the virus may have been introduced to North America via an imported or smuggled bird.²

Avian Influenza – Avian influenza (AI) is a contagious viral infection caused by the influenza virus Type "A", which can affect several species of food producing birds, as well as pet birds and wild birds. Avian influenza viruses, such as the H5 virus present in Asia can be transmitted to humans. More than 20 people have died in the Asian outbreak that began in late 2003. The virus can be carried by wild birds and spreads quickly in intensive poultry operations or live bird markets. Health officials fear that an AI virus could mutate, allowing human-to-human transmission. The EU, Canada and the US have banned the import of exotic birds from affected Asian countries.

¹ Environmental Health Perspectives, Vol 111, No 10, Aug 2003

² Science News, Vol 163, No 13, Mar 2003

The public health discussion on imported pets and wildlife

The emergence of these diseases has prompted increased research into their causes and spread. Concurrently, a discussion in some public health circles (mainly in the US, with apparently little public debate in Canada) has also begun focusing on the role of the global wildlife and pet trade in spreading infectious disease. Following are a number of extracts from this discussion, identifying key issues and concerns.

Testimony to US Senate committee hearings

In July of 2003, the US Senate Committee on Environment and Public Works held hearings on the impact of the importation of exotic species on human health and the environment. Testimony from senior public health officials and scientists expressed serious concern about the dangers of imported exotic animals.³

Dr. Stephen Ostroff, Deputy Director of the Nation Center for Infectious Diseases, told the committee that:

“Introduction of exotic species, such as rodents from Africa, can pose a significant threat to human public health, to domesticated animals and agriculture, and to indigenous wildlife through the introduction of non-native pathogens.” He added that, “...well intentioned pet dealers, breeders, and private owners often lack the expertise and resources to maintain exotic and native wildlife safely.”

Dr. Lester Crawford, Deputy Commissioner of the Food and Drug Administration testified:

“As we have learned too well, non-native animal species can create serious public health problems when they introduce a new disease to the native animal and human populations. Once introduced into the U.S., the sale or other distribution of an infected animal, or its release into the environment, can result in the rapid spread of disease to other animal species and to humans. A single uncontrolled case of a new disease has the potential to trigger an epidemic.”

Testimony from Marshall P. Jones, Deputy Director of the US Fish and Wildlife Service, described the impact of the rapid growth in the wildlife trade:

“U.S. wildlife trade has grown over the past decade, heightening concerns about species conservation, the introduction of injurious animals and plants, and potential risks to human health and domestic wildlife. In particular, the demand for live wildlife has escalated, driven in part by the increasing popularity of exotic pets in the United States.

³ U.S. Senate Committee on Environment & Public Works
Hearing Statements: Importation of exotic species and the impact on public health and safety, July 17, 2003

“The ease of travel, transport, and transaction (including e-commerce) has removed barriers to wildlife trade. Wildlife importers have access to ample financing, the latest computer and communications technology, and overnight air cargo shipping services from virtually any place in the world. The economic boom of the 1990s spurred international travel, giving Americans new opportunities to visit exotic locales and acquire exotic wildlife.

“From 1992 through 2002, the number of species regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – the international treaty which regulates trade in species that are endangered or threatened, or that are otherwise vulnerable to the effects of trade – increased 75 percent, and the number of CITES member nations rose from 115 to 162. U.S. trade in wildlife and wildlife products grew 62 percent, with declared shipments jumping from 74,620 to more than 121,000. The number of different species in trade increased 75 percent, jumping from some 200,000 in 1992 to more than 352,000 a decade later. Overall, in 2002, over 38,000 live mammals, 365,000 live birds, two million live reptiles, 49 million live amphibians, and 216 million live fish were imported into the United States.”

Jones also highlighted specific disease risks associated with wild animals:

“Live wildlife presents the highest risk for introduction of diseases that may be transmitted to humans or animals. Live mammals have been associated with rabies, brucellosis, herpes-B, hantavirus, Ebola, plague, tularemia and several other diseases that are transmissible to humans. According to Centers for Disease Control, 70,000 people get salmonellosis from live reptiles each year, and live birds have been responsible for transmitting avian chlamydiosis.

“The import of exotic wildlife parts, including meat, also poses the risk of introducing diseases. Contact with non-human primates in Central Africa is believed to be the source of HIV/AIDS in humans, and it has been suggested that the recent outbreak of Severe Acute Respiratory Syndrome (SARS) is linked to an Asian palm civet.”

Dr. Robert A. Cook, Adjunct Professor of Environmental Affairs at Columbia University, testified:

“In today’s global marketplace, wildlife is just another commodity. Wildlife destined for food markets and the pet trade is often transported over enormous distances. For example, animals found in the markets in Guangzhou, Guangdong Province, China include soft-shelled turtles captured in Sumatra, pangolins from Vietnam and Thailand, pythons from Myanmar and red-eared sliders from Florida. The result is a dangerous concatenation of circumstances, with animals and would be consumers from different ecosystems coming into contact. The lack of resistance to new pathogens makes humans and animals alike fertile, uncontrolled laboratories for these organisms to adapt and rapidly mutate. The staggering numbers of animals and people coming into contact with each other change the one-in-a-million odds of disease spillover into almost a daily

possibility. Even under the most hygienic conditions, this pool of viruses, bacteria, and other pathogens creates an optimal breeding ground for diseases to multiply rapidly and jump between species enabling them to exploit new hosts.”

Testimony by Dr Gabriela Chavarria, Policy Director for Wildlife Conservation at the National Wildlife Federation, reiterated concerns over disease from invasive species and focused on a specific class of viruses:

“...the import of alien and invasive species can present severe threats to human and environmental health. The recent spate of animal related diseases has highlighted the increasing opportunity for viral diseases to jump from animals to humans thereby presenting significant concerns for public health safety. SARS, monkey pox, West Nile virus and AIDS are but a few examples of such communicable diseases. Additionally, imported reptiles can convey salmonella, wild parrots may carry psittacosis, a form of Chlamydia, and rodents are infamous for carrying a range of diseases.

“One particularly telling example is the class of paramyxoviruses, fifteen of which have been discovered over the last four decades. This class of viruses, which is related to measles and mumps, as well as Exotic Newcastle disease (a particularly deadly virus affecting poultry) uses a wide range of animal hosts, including rats, bats, pigs, dolphins, seals, snakes and horses, and has jumped from animal species to animal species as well as to humans. In 1999, in Malaysia, an outbreak of the Nipah virus, listed as a potential viral bioagent by the U.S. Centers for Disease Control and Prevention, caused more than a hundred deaths – almost half the population of the local village. The virus was communicated from bats to pigs to humans. Outbreaks of paramyxoviruses have also occurred in recent years in Singapore and Australia, and scientists are investigating SARS as a potential member of that class of disease. The wide range of potential hosts, combined with the speed and rapidity at which SARS spread, reveals the significant threat posed by imports of animal host species as well as by and to the people who handle these animals.”

In contrast to these statements, the committee also received testimony from Marshall Meyers, Executive Vice President and General Counsel of the Pet Industry Joint Advisory Council (PIJAC), who stated:

“When examining the role of ‘exotics’ and human health, one must place it in perspective relative to other vectors (including humans) in our global economy. The actual number of human health related incidents involving traditional, as well as non-traditional, pets is really extremely small compared to the numbers of animals maintained as pets. The risk is also relatively low compared to diseases associated with the import and trade of non-pet animals for other industries.”

The debate widens

The concerns raised in the US Senate hearings over imported wildlife and disease have been echoed in a number of scientific journals, articles and papers and publications by health groups and wildlife organizations.

Following the US monkeypox outbreak the medical journal, *The Lancet* (Infectious Diseases) carried an editorial in July 2003 titled *Trade in animals: a disaster ignored*, which stressed the links between the trade in wild animals and disease. It concluded that: “The practice of taking animals from the wild for the pet trade also should swiftly be brought to an end. There will be fierce opposition to any such moves, and some of the trade will move underground, but if we can abolish such entrenched cultural traditions as burning at the stake and slavery, we can abolish the clear danger to human health of the wildlife trade.”⁴

Meanwhile, the National Association of State Public Health Veterinarians and the Council of State and Territorial Epidemiologists released a joint statement urging federal agencies to restrict the importation and exportation of native and foreign wildlife to protect public health. The statement declared that: “A lucrative and largely unregulated trade in imported wildlife is thriving in the United States. This trade poses a risk of introducing and disseminating exotic pathogens. These pathogens threaten both human and animal health, and have the potential to become established and maintained in native animal and insect reservoirs.”⁵ The Trust for America’s Health, a non-profit, non-partisan organization, echoed these concerns in a report on animal-borne epidemics. It recommended “reviewing laws impacting animal and wildlife control and commerce, with special attention to public health concerns.”⁶

In January 2004 scientists from 10 countries signed a declaration by the Wildlife Trust Alliance, calling on governments and relevant agencies to reassess the trade in wildlife. Among its recommendations were: improved disease surveillance of the wildlife trade for pathogens of humans, livestock and wildlife; funding for research to understand and forecast the risks of such transmission and stronger legislation and law enforcement related to the illegal wildlife trade.⁷ The trust’s president, Dr. Mary Pearl, said, “If disease issues linked to wild animal trade are not addressed there can be serious consequences... Most wild-caught animals found in pet shops and food markets have never been tested for disease and parasites that can harm humans or other animals.”

Writing in the peer-reviewed journal *Emerging Infectious Diseases* in March 2004, Dr. Abdu F. Azad, of the University of Maryland School of Medicine, analyzed outbreaks of tularemia (an infectious bacterial disease) and monkeypox. He described the outbreaks as a wake-up call for better surveillance of wild-caught animals before they are sold

⁴ *The Lancet Infectious Diseases*, Vol 3, no 7, July 2003

⁵ NASPHV/CSTE position statement, June 2003

⁶ *Animal-borne epidemics out of control: threatening the nation’s health*, Issue Report, Aug 2003

⁷ Wildlife Trust Alliance press release, Jan, 2004

internationally and imported. He concluded: “In introducing seemingly harmless furry friends, the trade of exotic pets brings together species that have never encountered one another in nature, with unpredictable and sometimes tragic results.”⁸

Transmission of disease from animal to animal

It is clear from the above that there is considerable consensus among scientific, medical and public health authorities that the trade in wild animals presents a real and significant threat of spreading infectious disease to humans.

As can be seen from several of the sources quoted, this threat also applies to other non-human animals. The disease risk to animals, both domestic and wild, from imported species has been the focus of recent scientific study. The damage to ecosystems and biodiversity by “invasive species” (non-native species introduced into foreign habitats) is an additional concern related to this area of study.

The threat to wildlife from imported infectious disease

The risks to wildlife have been highlighted in a Scientific and Technical Review (2002) by the World Organization for Animal Health (OIE). One paper in the review, examining the international regulation of wildlife trade, identifies the growing wildlife trade as a contributor to the increase in invasive species: “...with globalization, the exotic pet industry is growing rapidly and encompassing an entire range of organisms as companion animals, not dreamed of by the mass market.”

The paper cites the example of exportation of the red-eared slider turtle, a popular pet originating from the southern United States: “The red-eared slider is now a major pest in many parts of the globe including Europe and South East Asia, where it is causing huge damage to natural wetland ecosystem. In addition to the introduction of the organism itself, there are also concerns about the effects of its parasites and pathogens.”

The paper concludes that preventing introductions of alien invasive species is the cheapest and most effective option for minimizing the problem.⁹

⁸ Emerging Infectious Diseases, Prairie Dog: Cuddly Pet or Trojan Horse?, Vol 10, No 3, March 2004

⁹ International regulation of wildlife trade: relevant legislation and organizations, ME Cooper & AM Rosser, Rev.sci, tech. Off. Int. Epiz., 2002, 21 (1), 103-123

Another paper in the review discusses the dangers of moving wild animals from one location to another, explaining that any animal translocation contains two types of risk:

- That the introduction of exotic disease with the animals may adversely affect indigenous animal populations at the release site, and
- That diseases present in the indigenous animals at the release site may have adverse effects on the translocated animals.

The author concludes: “In light of these two types risk, animals should never be translocated without a thorough understanding of the potential disease agents present at both the site of origin and the release site.” A protocol to reduce the disease risk is described, which includes quarantine, diagnostic testing, evaluation of the health of source populations and restrictions on translocations from certain areas. But the author declares: “Despite all these precautions, there is always a risk in any movement of animals that disease agents that are currently unrecognized may be translocated, become established and cause disease problems in the new area.”¹⁰

A third paper in the review describes the trade in amphibians as an example of how the international movement of exotic species can spread disease:

“International movement of amphibians occurs primarily for commerce or as deliberate or unintentional introductions, with smaller numbers of animals moved in conservation programmes... Commercial activities centre on the pet, food and laboratory animal trades. An example is farm-reared bullfrogs (*Rana catesbeiana*) which are transported internationally as either live animals, or as frozen, skinned products. This trade supports employment in the countries of origin, as well as in the restaurants of Europe, Asia, North and South America and elsewhere. Dwarf clawed frogs (*Hymenochirus curtipes*) of African origin have been introduced widely throughout the USA to stock ornamental ponds, and a wide range of tropical and temperate species are moved globally as part of the pet or amateur hobbyist trade. The trades are a particular concern for disease introduction, since outdoor enclosures allow contact between exotic and native species, and because exotic pet species are often released into inappropriate areas accidentally or deliberately.”¹¹

The global spread of disease among amphibians has been a major concern of scientists in the field, as an article in *The Scientist* magazine illustrated: “Over the last decade, outbreaks of the amphibian fungal plague chytridiomycosis have cropped up throughout the world, causing massive die-offs and even extinctions in North, Central, and South America, and Australia.”¹²

¹⁰ Disease management strategies for wildlife, G Wobeser, *Rev. Sci. tech. Off. Int. Epiz.*, 21 (1), 159-178

¹¹ Emerging infectious diseases in wildlife, ES Williams, T Yuill, M Artois, J Fischer, & SA Haigh, *Rev. Sci. tech. Off. Int. Epiz.*, 21, 139-157

¹² Dinner, Pets, and Plagues by the Bucketful, J Ginsburg, Vol 18, Issue 7, April 12, 2004

Studies of the spread of chytridiomycosis have caused alarm about the wider issue of the trade in animals. For example, a study carried in the CDC's Emerging Infectious Diseases journal stated: "Chytridiomycosis is an emerging disease responsible for a series of global population declines and extinctions of amphibians. We report the causative agent, *Batrachochytrium dendrobatidis*, in North American bullfrogs (*Rana catesbeiana*) farmed for the international restaurant trade. Our findings suggest that international trade may play a key role in the global dissemination of this and other emerging infectious diseases in wildlife."

The threat to domestic animals from imported exotic diseases

As mentioned above, the Nipah virus killed more than 100 people in Malaysia in 1999. Spread from bats, the virus also affected pigs, over a million of which had to be slaughtered.¹³ The outbreak is a clear illustration of the threat that emerging diseases in wildlife can present to domestic animals and livestock.

Exotic Newcastle disease is a contagious and fatal viral disease affecting all species of birds. In 1971, a major outbreak occurred in commercial poultry flocks in southern California. The disease threatened not only the California poultry industry but also the entire U.S. poultry and egg supply.¹⁴ The disease was first diagnosed in California in 1950 among pheasants imported from Hong Kong. The recent epidemic of the disease was probably the result of Southern California cockfighting operations, which are illegal, with speculation that the fighting gamecocks had been smuggled into country.¹⁵ Smuggled pet birds, especially Amazon parrots from Latin America, pose a great risk of introducing exotic Newcastle into poultry flocks.¹⁶

A variety of infectious diseases of domestic animals and livestock can be potentially spread by wild or exotic species.

The US National Institute for Animal Agriculture has said that the public sale and interstate movement of wild and exotic animals in the United States has greatly increased, and that it appears that such sale and movement will continue to increase. It points out that wild and exotic animals have been found to be infected with bovine tuberculosis, brucellosis, Chronic Wasting Disease (CWD), and vectors capable of transmitting foreign animal diseases or parasites foreign to the U.S.¹⁷ The statement concludes: "Diseased exotic animals can potentially infect domestic livestock with these diseases."

¹³ Nipah Virus Infection in Bats (Order Chiroptera) in Peninsular Malaysia, *Infectious Diseases*, Vol 7, No 3, May/June 2001

¹⁴ California Dept of Food & Agriculture webpage, Animal Health Branch, April 2004

¹⁵ Los Angeles County Dept of Health Services webpage, Veterinary Public Health, April 2004

¹⁶ USDA Animal and Plant Inspection Service fact sheet, January 2003

¹⁷ 2003-2004 NIAA Resolutions & Position Statement, Animal Health Emergency Management

A report by the USDA's Center for Emerging Issues echoes these worries, listing disease threats from captive wildlife, free-ranging wildlife, relocated wildlife and exotic animal imports. The report states: "Along with the increased interest in wildlife is a growing concern over the part that wildlife, both free-ranging and captive, plays in disease transmission. Interaction and transmission can occur within wildlife populations, between wildlife and traditional domestic animals, and between animals and humans."¹⁸

One of the less well-known diseases threats to domestic animals is carried by imported reptiles. A 2003 study by Dr. Michael Burrige, of the University of Florida, found that reptiles imported into the US for the pet trade carry ticks that can spread disease, threatening the health of domestic animals and wildlife.¹⁹ Since 1997 Burrige and his colleagues have found at least 11 exotic tick species have been imported into Florida on reptiles and at least seven of those species have spread beyond importation facilities, and at least five had spread within the state to other captive reptiles. Two species were known carriers of heartwater, an often-fatal circulatory infection that affects livestock in Africa and the eastern Caribbean. The study pointed the finger at inadequate restrictions on the trade in reptiles as the source of the threat, concluding: "In the absence of measures to control introduction of these importations, some exotic tick species will develop breeding colonies and become established as indigenous species and some tickborne diseases may be introduced to wreak havoc among susceptible native populations."

The growth in trade in exotic pets and wildlife

It seems clear from the foregoing that imported exotic animals can spread disease among humans and animals, both wild and domestic. But what is known about the nature and size of trade in exotic pets and wildlife?

The value of the international trade in wildlife products has been estimated at US\$15 billion²⁰ and the value of the global illegal wildlife trade has been estimated by Interpol to be more than US\$6 billion.²¹ The trade is growing. As mentioned above in Marshall Jones' testimony to the US Senate, trade in species regulated under CITES increased by 75 per cent between 1992 and 2002.

A large proportion of the trade involves reptiles. According to the wildlife trade watchdog group, Traffic, the international trade in live reptiles increased dramatically in

¹⁸ The Wildlife Industry: Trends and Diseases Issues, USDA Animal & Plant Health Inspection Service, Centre for Emerging Issues report, Aug 2001.

¹⁹ Exotic ticks introduced in the US on imported reptiles from 1962 to 2001 and their potential roles in dissemination of diseases, MJ Burrige, LA Simmons, Feb 2003

²⁰ Traffic report: Making a killing or making a living? Wildlife trade, trade controls and rural livelihoods, March 2002.

²¹ UK National Wildlife Crime Intelligence Unit webpage, April 2004 (www.ncis.co.uk/wildlifecrime.asp)

the 1990s. A study by the Humane Society of the United States reported that 18.3 million live reptiles were imported to the US between 1989 and 1997. There are few Canadian figures available for the trade, but given the close economic and cultural links between the two countries, it would be unlikely that the demand for pet reptiles was not mirrored in Canada. There are numerous reptile breeder and import/exporters on the Internet, including Canadian-based operations.

There is little doubt that the exotic animal trade, especially the reptile trade, is a booming business.

Canada and disease from imported wild and exotic animals

The Canadian Food Inspection Agency (CFIA), working with the Canadian Wildlife Service (CWS) and the Canada Border Services Agency (CBSA), provides the first line of defence against the threat of disease from imported animals.

The CFIA conducts inspections and has monitoring and testing programs in place to prevent and control the spread of diseases that are transmissible from animals to humans and animals to animals. The CFIA currently operates a “species-specific” surveillance system, gathering intelligence from around the world to decide which animals and which countries pose a threat in terms of infectious disease. This prevents the vast majority of wild and exotic species from legally entering the country.

However, there are two areas the CFIA system does not fully address: the importation of reptiles and amphibians and the importation of rodents.

The CFIA does not inspect reptiles imported into Canada, as its website clearly states:

“Please be advised that amphibians and reptiles (excluding turtles and tortoises) are no longer regulated under the Health of Animals Regulations and as a result, no Canadian Food Inspection Agency import permit is required, nor a health certificate and no inspection will normally be done at the border. Imports are permitted from any country, for any use, to any destination in Canada.”

This exclusion from regulation would appear to leave open the potential for the importation of reptile-borne ticks, which are vectors for diseases such as heartwater, as reported in the study by Burrige et. al., above. The risk is perhaps increased further by the expected impact of climate change, which has been predicted to expand the ranges of vector-borne diseases such as Lyme disease and encephalitis.²² There is the additional problem of imported amphibians and the disease impact they have had on native species, as described above.

²² Climate Change and Health, paper by Diane Beattie, British Columbia Ministry of Water, Land & Air Protection, December, 2001

Similarly, rodents are also excluded from the Health of Animals Regulations. The case of the US outbreak of Monkeypox via Gambian rats and prairie dogs in May 2003 illustrates potential shortcomings created by this exclusion. On June 11, 2003, the US Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) issued a joint order prohibiting the importation of all African rodents into the United States. Canada imposed a similar ban in September 2003.²³ Prior to the ban it would have been possible for Gambian rats or prairie dogs to enter Canada, thus allowing the Monkeypox virus to be imported into the country.

This inherent weakness of the “species specific” surveillance system, which can only react once the disease threat is manifest, was raised in a Health Canada report in 1997, which stated:

“Although the exotic pet trade industry moves relative quickly from one species to another, regulations surrounding it are species- and disease-specific... Due to the dynamic nature of the exotic pet trade on a species level, coupled with an overall increase in these animals as pets, an industry-specific framework may be more appropriate to direct public-health action to reduce zoonotic illness from exotic species than species-specific regulation.”²⁴

By “industry-specific” it can be assumed the report means regulating the pet import industry as opposed to individual species imports.

The continuance of the species-specific system means that it remains possible to import a rodent that has not previously been identified as a disease carrier or has not come from a country identified as an area of disease risk. This can be illustrated by using the CFIA’s Automated Import Reference System (AIRS), an Internet-based, accessible database that provides information on import requirements for all commodities regulated by CFIA.

For example, a query on AIRS regarding the importation of a Capybara (a large South American rodent) from Brazil will inform a potential importer that:

- There will be a recommendation to Customs that the importation be approved
- No certification is required
- There are no animal health requirements

Yet, the Capybara has been shown to be a carrier of ticks that risk the transmission of disease to animals and humans.²⁵ Furthermore, these animals can be found for sale through exotic animal dealers on the Internet.²⁶ It is perfectly possible that the Capybara

²³ Prairie Dog and Certain Other Rodents Importation Prohibition Regulations, Health of Animals Act, Registration SOR.2003-310 10 September, 2003

²⁴ Canada Communicable Disease Report, Vol 23-17, Sept 1997

²⁵ Report on ticks collected in the Southeast and Mid-West regions of Brazil: analyzing the potential of tick-borne pathogens to man, LTM Figueiredo, SJ Badra, LE Pereira, MPJ Szabo, Magazine of the Brazilian Society of Tropical Medicine, Vol 32

²⁶ Example: <http://www.geocities.com/petsburgh/farm/2323/index.html>

could be the ‘next big thing’ in the exotic pet trade. If so, it appears it could enter Canada, along with any disease, parasite or disease-vector it might be carrying. Like the Gambian Rat in the US, its threat would only become apparent *after* it had entered the country.

The CFIA’s species-specific surveillance system and the lack of regulation on the importation of reptiles and rodents may represent Canada’s Achilles heel when considering the risk of disease from imported exotic animals and is a cause for concern.

At least one public health official in Canada has suggested more be done to tighten the CFIA’s systems. Dr. Perry Kendall, the Provincial Health Officer for British Columbia, has recommended that:

- Animals being imported into Canada should be required to undergo quarantine and a veterinary inspection.
- The CFIA should treat the pet trade with similar attention to that paid to the importation of agricultural species.²⁷

Neither is currently the case.

The disease risk from illegal animal importation

The CFIA system deals with the legal trade in animals. There is, of course, the *illegal* trade in wildlife, which aims to circumvent the system entirely. This is where the Canadian Wildlife Service (CWS) has key responsibilities. The CWS is responsible for the enforcement of the Wild Animal and Plant Protection and Regulations of the International and Interprovincial Trade Act (WAPPRIITA). Under the authority of the act CWS officers investigate the smuggling of exotic animals and plants into Canada. This includes targeted inspections in which an officer inspects a specific activity or specimen such as a container at a port. Officers also respond to tips, complaints or intelligence about an illegal offence. Among a variety of duties the service conducts target inspections of transboundary shipments and luggage at 276 clearance areas.²⁸

CWS inspections are a vital defence against the importation of disease through the ever-growing illegal trade in wildlife (as described above). Yet, according to WAPPRIITA annual reports, the number of inspections has been in steep decline during the last decade - from a peak of 6940 inspections in 1999 to only 1873 in 2001 (Latest available figures. As of April 2004, the CWS had no reports available for 2002 or 2003).

²⁷ Letter to Vancouver Humane Society, July 4, 2003

²⁸ 2000 Special Report on Enforcement Activities, North America Working Group on Enforcement and Compliance Cooperation, June 2001

	Investigations	Successful prosecutions	Inspections re wildlife trade
2001	232	Report states “many”	1873
2000	283	27	2153
1999	800	9	6940
1998	650	8	5800
1997	300	7	5700
1996	200	Not stated	3995

WAPPRIITA enforcement by Canadian Wildlife Service (from CWS annual reports)

It should be cause for concern if fewer inspections are taking place, given the increasing number of emerging infectious diseases from animals and the scale of the illegal wildlife trade. It is worth noting that Interpol, the International Criminal Police Organization, has categorized Canada as both “producing and consuming” illegally trafficked animals.²⁹ No one knows how many animals are entering Canada illegally, but without adequate resources the CWS cannot possibly cope with the burgeoning illegal trade in wild and exotic animals.

Conclusion

The global rise in emerging infectious diseases is well documented, as is the fact that the majority of these diseases are of animal origin. There is a considerable consensus of scientific opinion that the translocation of wild and exotic animals through trade poses a significant threat of spreading infectious disease to humans and other animals.

This threat has been discussed in scientific and medical journals and in the public health community, especially in the United States. There appears to have been little public discussion of the issue in Canada, which is worrying given evidence that suggests the country’s vulnerabilities to the threat.

This includes the weakness of the Canadian Food Inspection Agency’s “species-specific” system for identifying imported disease-carrying wild animals. As has been shown in the case of Canada’s response to the Monkeypox outbreak in the United States, the system is *reactive*, prohibiting the disease-carrying animal (Gambian rats) from entering the country only *after* the US outbreak made plain it was a threat.

A further weakness in the CFIA system is the absence of full regulatory power over the importation of reptiles and rodents. Both can carry diseases and there is new evidence that reptiles represent a specific threat to domestic native animals as carriers of disease vectors (ticks). This is especially alarming, considering that the trade in live reptiles as pets is a large and rapidly growing industry. To have so little regulatory control over their entry is cause for concern.

²⁹ Article by Raymond E. Kendall, Secretary-General of Interpol, UN Environment Program’s Our Planet Magazine, Feb 6, 2003

Lastly, there may be a weakness in Canada's defence against the importation of infectious disease through the smuggling of wildlife into the country. The decline in inspections by the Canadian Wildlife Service after 1999, in the face of the growing global illegal trade in wildlife, suggests an increased vulnerability to disease introduced by illegally imported species.

These vulnerabilities may seem relatively small in the face of other, much discussed, security threats, such as terrorism. Yet, historically, it is the spread of pathogens that has represented the greatest threat to human and animal welfare. The traffic of pathogen-carrying animals is a well-recognized historical problem, with all three global pandemics of bubonic plague traceable to travel and trade.³⁰ It is impossible to close all the channels through which pathogens might travel, in light of globalization. But if the international exotic pet trade is one such channel, it would seem foolish to allow such a frivolous activity to jeopardize human and animal health by not closing it.

Animal protection agencies usually confine themselves to the animal welfare issues arising from the trade in exotic animals – primarily the suffering they endure in transport and captivity and the threat to species survival that results from taking so many animals from the wild. Yet, in researching and monitoring these issues, it is impossible to avoid the growing evidence that this trade is also a risk to the health of humans, other animals and biodiversity. It is important that this threat be brought to light and publicly debated. It is hoped that this report will encourage such a debate.

³⁰ Corrie Brown, DVM, PhD, The importance of emerging diseases to the health of the world., OIE Regional Conference and 14th Annual Meeting of Federation of Asian Veterinary Associations, Aug 2002

References

Reports and studies

- Animal Health and Production Risk Analysis Framework (Appendix 1), Canadian Food Inspection Agency, Oct. 2001
- Infectious Diseases of Pet Animals from Europe and Elsewhere, report to UK Ministry of Food and Fisheries, Centre for Comparative Infectious Diseases, University of Liverpool, July 2000.
- Emerging Infectious Diseases of Wildlife – Threats to Biodiversity and Human Health, P Daszak, A.A. Cunningham, A.D. Hyatt, Science, Vol. 287, 21 Jan. 2000.
- Environmental and Economic Costs Associated with Non-indigenous Species in the United States, D. Pimentel, L. Lach, R. Zuniga, D. Morrison, College of Agriculture and Life Sciences, Cornell University, June 1999.
- Reptiles as Pets: An Examination of the Trade in Live Reptiles in the United States, J. Franke, and T.M. Telecky, Humane Society of the United States, 2001.
- B-virus form Pet Macaque Monkeys: An Emerging Threat in the United States?, S. Ostrowski, M.J. Leslie, T. Parrott, S. Abelt and P.E. Piercy, 1998.
- Emerging Pathogen of Wild Amphibians in Frogs (*Rana catesbeiana*) Farmed for International Trade, 2003.
- Removing Obstacles to Health Development, Chapter 10, Diseases Continue to Catch the World Off Guard, World Health Organization, 1999.
- West Nile Fever: Lessons from the 2002 Season, S.M. Gordon and C.M. Isada, Department of Infectious Disease, The Cleveland Clinic, 2003.
- First Reported Prairie Dog-to-Human Tularemia Transmission, Texas 2002, S.B. Ashia et. al., Mar. 2004.

Articles

- Endangered Species: Traded to Death, A Wagener, Earth Trends, World Resources Institute, Aug. 2001.
- Pocket Pets, B.K. Mackay, Animal Issues, Vol. 32, No 1, Spring 2001
- Attendees at Atlanta Disease Conference Urge Closer Surveillance of Animals, The Miami Herald, Mar. 3, 2004.
- Endangered Creatures for Sale – Illegal Animal Trade Reaps Billions Yearly, C. Seabrook, US Fish & Wildlife Service, Southeast Region Law Enforcement News, Dec. 21, 2003.
- Keeping the Bugs Out – Leading-edge Lab in Winnipeg Tracks Infectious Diseases, Health Canada website, Nov. 2000.
- Wildlife Markets and Disease Transmission: The Problem is, Pigs and other Animals do Fly, www.sciencedaily.com, July 2003.
- Getting out into the Field and Forest, The Lancet Infectious Diseases, Vol. 4, No. 3, Mar. 2004.
- Animal Diseases ‘threaten humans’, BBC News website, Jan 13, 2004.
- The Pet Offensive, T. Williams, Audubon magazine, The Audubon Society, Dec. 2003.
- Profile: Spread of Infectious Diseases among humans, domesticated and wildlife, transcript of National Public Radio’s Morning Edition, Jan. 21, 2000.
- Emerging Epidemics – We have no one but ourselves to blame for the rise of new killer diseases, book review (Six Modern Plagues: And How We are Causing Them by Mark Jerome Walters), Nature, Vol. 428, Mar. 4, 2004.
- The Problem of Exotic Pets, New York Times editorial, July 13, 2003.
- Wake-up call: New infectious diseases in wild animals threaten both biodiversity, human health, P. Williams, Columns Campus News, University of Georgia, Feb. 14, 2000.
- Bio Invasion: No longer hindered by time and distance, disease can strike and species, anywhere, Business Week special report, Sept 11, 2000.
- Biological Hazards Ahead, D. Lodge, New York Times op-ed, June 19, 2003.
- Exotic and Endangered, H. Chew, Malaysia Star, Jan. 28, 2003.
- Singapore’s Growing Illegal Trade, CNN.com, Nov. 3, 2003.
- Animal Trade Thrives Amid Crackdown, The Jakarta Post, Mar. 5, 2004.

Wild Markets: International Trade in Wildlife is on the Rise, World Resources Institute, WRI Features, Vol. 1, No. 5, June 30, 2003.

International Trade in Reptiles Booms, Dispatches, Traffic Network, www.traffic.org, Sept. 1998.

Prairies Dogs Safe, Pet Shop Says, The Record, Kitchener Ont., June 14, 2003.

Canada is Animal Smugglers' Haven, Maya Bevin and Keith Martin MP, Times Colonist, Victoria, BC, June 1, 2001.

Tularemia Outbreak Identified in Pet Prairie Dogs, Journal of the American Veterinary Medical Association, Oct. 1, 2002.

Diseases from Animals – Why Now?, D DeNoon, WebMD article, www.my.webmd.com, July 8, 2003.

Surveying Wildlife, J Ginsburg, The Scientist, Vol. 18, Issue 7, 28, April 12, 2004.