Health in Conservation:
One World, One Health™
Over the last few decades, it has become increasingly evident that our own health and the health of wild and domestic animals are all inextricably linked. Conservation often bridges these links with scientific data, improved planning, and collective solutions. In our interconnected world, a single pathogen can wipe out our last populations of an endangered species and, in turn, threaten the stability of local human populations. In some instances there are diseases that are devastating to both human and wildlife populations. Each human outbreak of the deadly Ebola virus has been traced back to a human-animal interaction. Beyond the human casualties of Ebola epidemics, scientists estimate that significant numbers of the world’s gorillas and chimps have died from the disease.

WCS, more than any other zoological or conservation organization, has been the pioneer in promoting wildlife health as critical to saving wildlife and wild places. As the only major conservation organization with a dedicated staff of veterinarians, WCS is committed to advancing the development of veterinary science professionals working in wildlife conservation around the world. Building on more than 100 years of hands-on veterinary work, disease surveillance, and groundbreaking scientific research, WCS remains dedicated to ensuring the health of wildlife species around the globe and in our zoological parks in New York City.

In our rapidly changing world, there is an urgent need to simultaneously address the health of people and animals, recognizing that diseases pose challenges to both conservation of the planet’s biodiversity and efforts to improve the quality of human life. WCS is at the forefront of this One World, One Health™ interdisciplinary approach. We develop and implement solutions that achieve long-term conservation success and create a healthier world. By engaging partners across conservation, public health, agriculture, and beyond, we provide critical information that influences policy and action.
WILDLIFE: THEIR HEALTH IS OUR HEALTH

Great Apes

The great apes of Africa and Asia are our closest living relatives, and sadly they are in decline worldwide. Though ecotourism has undoubtedly helped save species like the mountain gorilla from extinction, it has also brought people visiting and working with gorillas into close enough contact to pass on infections—likely ones to which apes have no natural immunity. A respiratory virus, for example—however mild in a tourist—could prove devastating to a wild population of gorillas exposed to it for the first time. Managing the human/great ape health interface is critical to the survival of great apes, and WCS veterinarians are on the front lines of developing preventative measures and training park rangers, communities, and field researchers to combat this threat.

Great apes are highly susceptible to infectious diseases such as Ebola. By improving our understanding of the Ebola virus’ lifecycle, we can develop ways to prevent the disease from spreading among their threatened populations.

Tigers

Due to habitat loss, tigers no longer live in large, continuous ranges. Their terrains are now all too often limited to small, fragmented areas usually bordered by human communities and farms, increasing contact between these big cats, people, and domestic animals. As a result, tigers and other wild species are now more vulnerable to infectious disease. The loss of more than half the Siberian tigers within the core protected area of Russia’s Sikhote-Alin Biosphere Reserve in 2010 due to an outbreak of canine distemper virus is a case in point. In a groundbreaking study, WCS health experts, together with Russian partners, were the first to confirm the presence of the disease in tigers, and are now investigating how the virus behaves and is transmitted. Our work is focused on protecting Russian Far East tigers from future disease outbreaks, including the possibility of developing an oral vaccine.

Reptiles and Amphibians

In some circumstances, it is necessary for WCS and partners to breed or raise a species in captivity and release animals to restore at-risk wild populations. It is essential that released animals are healthy so that foreign pathogens are not inadvertently introduced into wild populations. WCS husbandry, management, and veterinary staff experts have supported the breeding, hatching, raising, and safe release of many species, including healthy Burmese star tortoises in Myanmar, Southern River terrapins in Cambodia, and Grand Cayman iguanas in the Caribbean. These efforts have successfully grown wild populations. For example, Grand Cayman iguanas have increased from less than 20 to over 900 animals in the wild over the past 12 years, and a recent release of 21 Southern River terrapins tripled the wild population of this species in Cambodia.
Finding Room for Both Wildlife and Livestock

In today’s world of shrinking natural habitats and climate change, transboundary conservation is becoming ever more important to entrapped wildlife populations. A five-nation conservation area in southern Africa (called KAZA) spans an extensive series of parks and reserves, and is home to the largest remaining population of elephants in the world (250,000). Southern Africa’s economy benefits increasingly from tourists who travel from around the world to view elephants and other iconic wildlife within this vast area. But local wildlife has suffered devastating effects due to a major artificial feature of the landscape that has disrupted key migration paths and blocked access to seasonally important water and grazing. Miles and miles of disease-control fencing were erected by governments starting in the late 1950s to separate domestic livestock and large wild mammals out of fear of the commercial ramifications for the beef trade of foot and mouth disease, a virus that wild African buffalo can carry. These vast fences have disrupted the migration paths of species such as wildebeest and red hartebeest, resulting in steep declines. In the Kalahari system in western Botswana, wildebeest numbers plummeted from 315,000 to 16,000, and hartebeest from 293,000 to 45,000 in just over two decades.

While effective conservation requires dedicated action at the local level, conserving wildlife within KAZA—on the verge of becoming the largest land area dedicated to conservation on the planet—requires effort on a different scale. WCS is the only truly boundaryless conservation organization with the animal health policy expertise needed to work with regional governmental and international trade bodies to facilitate adoption of alternative, non-fence-based practices (related to how cattle and beef processing are managed) for effectively mitigating the risk of foot and mouth disease. This groundbreaking work has the potential to diminish reliance on fences across southern Africa and reestablish historic migration routes.

“The success or failure of transboundary initiatives like KAZA has significant implications for the world’s largest population of elephants, which numbers approximately 250,000. Whether we’re looking at a complex international land-use matrix like KAZA, or a small national park surrounded by human-dominated activities, challenges at the wildlife-livestock-human health and livelihoods interface simply merit more attention than the conservation or development communities have given them to date.”

—DR. STEVEN A. OSOFSKY, WCS EXECUTIVE DIRECTOR OF WILDLIFE HEALTH & HEALTH POLICY
Bushmeat Consumption and Micronutrient Deficiencies

From the oceans to the upper atmosphere, we are gaining an ever greater understanding of the impacts of human activities on the natural world. Far less understood are the effects these changes to the natural world have (and will have) on humankind itself. Throughout Africa—where WCS has long worked to conserve fascinating wildlife—local people rely upon bushmeat for protein and micronutrients. But many poor rural communities are losing access to bushmeat due to overharvesting. In Madagascar, our scientists and partners have shown that without wild meat, children in particular are deficient in nutrients that are essential to proper physical and mental development.

WCS and public health sector partners are spearheading work to aid rural communities in accessing alternative nutrient-rich foods, while at the same time protecting wildlife. This is critical work: undernutrition is believed to be the underlying cause in one-third of deaths in children under age five, particularly in sub-Saharan Africa and south Asia. By helping families and communities understand the links between access to wildlife and nutrition for women and children, our efforts are demonstrating how more sustainable management of wildlife can yield significant public health benefits. Armed with this knowledge, local communities are incentivized to protect their natural resources rather than permit unsustainable extraction for short-term commercial purposes. At the same time, alternative sources of nutrition like village poultry development are also helping displace pressure away from local wildlife.

Global Wildlife Trade

Illegal wildlife trafficking is increasingly recognized as a threat not only to biodiversity conservation, but also to public health. Evidence is mounting that diseases emerging from wildlife trade can have exorbitant public health and economic consequences. The 2003 SARS outbreak that infected over 8,000 people worldwide and caused billions of dollars of economic damage has been linked to human contact with a species of civet sold in Chinese wildlife markets. The illegal trafficking of wildlife is a multibillion-dollar industry and the immense profitability of this illicit activity has hindered decades of conservation-focused advocacy work.

However, the negative public health and costly economic impacts of emerging diseases represent a compelling argument for governments to enforce existing laws and create new ones as needed to halt this destructive practice. Working with a wide range of partners, WCS health scientists are collecting data on diseases emerging from the global wildlife trade. This vital information is needed to better characterize public health threats and help leverage political will to turn the tide against this ecologically devastating industry.

A civet in a cramped illegal wildlife market. Civets and other trafficked species suffer many ill effects and can transmit diseases that threaten the health of humans and animals worldwide.
Since our founding in 1895, WCS has harnessed our veterinary expertise to save wildlife and wild places around the globe. From intensively caring for animals at our New York City zoos and aquarium, to aiding rural communities with livestock health, to monitoring the health status of elusive gorillas in the wild, WCS veterinarians and epidemiologists collectively represent an unparalleled constellation of resources in the field of wild and domestic animal health. Our unique contributions include cutting-edge diagnostics, our Wildlife Health Center, and training programs for the next generation of conservationists.
Wildlife Health Center

The Wildlife Health Center on WCS’s Bronx Zoo campus is a renowned teaching and research hospital, implementing the latest medical and surgical diagnostic technologies and treatments. It is headquarters to our health professionals who provide care to over 1,000 species and conduct the diagnostic testing and training that informs our global health work. This 30,000-square-foot medical and research facility includes a state-of-the-art surgery suite, necropsy room, as well as clinical, histology, and molecular laboratories.

Our custom-built mobile molecular diagnostics laboratory is deployed around the globe to analyze samples in the field in near real-time. This mobile lab has been instrumental in tracking the spread of chytrid fungus, which is decimating amphibians throughout the world. The critical information we collect informs amphibian protection plans. In Myanmar, the mobile lab has allowed WCS to screen captive turtles for key pathogens to help determine their suitability for reintroduction into the wild. We are also working on expanding our mobile diagnostic capacity to detect diseases like canine distemper in tigers. In short, mobile diagnostic technology allows WCS scientists to obtain lab results while still in the field, thus informing management decisions more quickly than ever.

Training the Next Generation

For over 70 years, training the next generation of zoological and wildlife health professionals has been a hallmark of WCS’s health program. Recently, WCS helped train veterinary students in Cambodia and Peru, supporting them as they conducted their thesis research. Closer to home, U.S. and Canadian veterinary and veterinary technician students train at the Wildlife Health Center as part of their academic course work. Collaboration with health colleagues in the Russian Far East combines mentorship in the field with training at the Wildlife Health Center in New York. Together, our clinical and pathology residency training programs equip graduate veterinarians with the skill sets needed to assume leadership roles in zoos, aquariums, and conservation organizations.

Cutting-edge Diagnostics

We cannot begin to address health threats until problems are accurately identified. WCS’s pathologists who specialize in wildlife diagnostics fill this need. Our Bronx Zoo-based pathologists analyze biological samples from our New York City zoos and aquarium as well as samples collected from wildlife around the world.

When a tragic mass stranding of melon-headed whales occurred in Madagascar in 2008, our pathologists were deployed to conduct necropsies. Their research helped identify the cause as sonar mapping by an oil and gas survey vessel, and those findings are now changing the international practices that the extractive industry has to follow to protect marine life.

“The diverse clinical and policy experience of WCS’s wildlife health experts not only assures the best possible care for the animals in our parks and protection in the landscapes and seascapes where we work, but also makes them a sought-after resource worldwide.”

—DR. CRISTIÁN SAMPER, WCS PRESIDENT AND CEO
WCS’s health program develops innovative approaches to wildlife management, identifies and prevents new and emerging diseases, decreases conflict between wildlife and livestock, and builds new partnerships for conservation. 

Join us to conserve species and places under threat while safeguarding human communities around the globe.