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Wildlife Health Cornell

A College of Veterinary Medicine Center of Excellence

Because we need nature, and nature needs us
Summer 2017

Addressing Wildlife Health in a Rapidly Changing World



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Wildlife Health Cornell represents an unprecedented approach to the health challenges wild animals face here in the northeast U.S. and around the world - a comprehensive, science-based response by a team of the world's top wildlife health experts. With an emphasis on the types of interdisciplinary collaboration often required to foster real progress along the science to policy and action continuum, Wildlife Health Cornell has grown out of a palpable sense of genuine urgency regarding the fate of our planet's wildlife, an increasing understanding of our own dependence on the planet's natural systems, and a recognition that it will take a new generation of colleagues to halt and reverse the trends we face.

Cornell University today is very much about impact, about teamwork that capitalizes upon the vast array of disciplinary expertise available across the university, and about engagement. We hope you find this first edition of our e-newsletter useful and thought-provoking.

- Steve Osofsky, DVM

Jay Hyman Professor of Wildlife Health & Health Policy



Sustainable Moose

College of Veterinary Medicine researchers and partners are evaluating the health of moose populations across the New York Adirondacks region. By screening animals for infectious diseases and developing health indicators for evaluation over time, we can assess factors key for ensuring the population's long-term viability.

The Urgency of Planetary Health

Concern has been spreading across scientific disciplines that the pervasive human transformation of Earth's natural systems is an urgent threat to human health, and Cornell's College of Veterinary Medicine is helping to forge a new field to meet unprecedented challenges.



Conservation CSI: Long Island

Cornell scientists and partners have discovered that saxitoxin, a potent neurotoxin from algal blooms, was the cause of a massive die-off of diamondback terrapin turtles and fish. Understanding what's happening in this fragile ecosystem is key to preventing future crises - for wildlife and people.

Students on One Health's Frontiers

Cornell veterinary students are benefiting from international experience that ties coursework in language, culture, and research to hands-on fieldwork. They are able to spend eight weeks in Indonesia,

Uganda, or the Republic of Congo to experience first-hand how the health of wildlife, domestic animals and people - and the health of the environment - are all deeply interconnected.



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Win-Win for African Farmers, Wildlife

Veterinary fencing, having killed hundreds of thousands of southern Africa's wild animals since the 1950's by disrupting their key migratory pathways, is no longer the only option for managing foot and mouth disease in the region.

Citizen Science Brings Schools - of Kids and Fish - Together

Hundreds of students ranging from fourth-graders to high school seniors across New York State are engaging in a hands-on scientific project with Cornell University by collecting water samples and evaluating environmental DNA to monitor the spread of invasive fish species, providing a real-world lesson in ecology and environmental management.



Veterinary Students Extend a Helping Hand to Belize Zoo

College of Veterinary Medicine students have partnered with the Belize Zoo and Tropical Education Center, gaining valuable experiences they will never forget.

\$1.7M Received for Planetary Health

Cornell University's College of Veterinary Medicine was awarded \$1.7 million from The

Rockefeller Foundation to support our pioneering work in Planetary Health.



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To learn more about Wildlife Health Cornell, please contact
Dr. Steve Osofsky at s.osofsky@cornell.edu .

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Cornell University College of Veterinary Medicine

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Of Moose and Men: CVM Researchers gathering key insights on New York State moose populations

🐾 Monday, January 23, 2017 - 9:38am



Image Courtesy of Jeanne Ross, Native Range Capture Services, wildlife veterinarian

Cornell researchers are mugging moose—but don't worry—it's for the moose's benefit. Last week, researchers and New York State Department of Environmental Conservation (NYSDEC) biologists converged in Old Forge, N.Y., to meet with a wildlife helicopter capture crew, *Native Capture*, to catch moose for a multi-year project investigating moose populations and health in the Adirondacks region of New York.

The broad goal of this project is to determine how many moose are in New York, along with factors that may impact the population's viability--such as habitat carrying capacity and diseases.

"Fortunately, moose in New York generally appear healthy, and are not suffering from winter tick infestation as some populations in the Northeast and other states," says Dr. Krysten Schuler, a

wildlife disease ecologist with the Department of Population Medicine and Diagnostic Sciences who has been examining moose health as part of the Cornell Wildlife Health Lab's work with the NYSDEC.

Schuler was also part of last week's "moose mugging" crew. From a helicopter, two "muggers" locate, and then either shoot a net over the moose or use chemicals to immobilize it. They then handle the animals, putting tracking collars on the moose and collecting the samples for the scientists who are on site to process the blood, feces, parasites, and tissues gathered from the animals. Schuler, along with wildlife veterinarians Drs. Jeanne Ross and Nina Schoch, and Cornell wildlife health research aide, Niki Dean, process the samples. The Cornell Wildlife Health Lab screens them for a variety of infectious diseases and health indicators.

So far, in 2017, five female moose have been darted from a helicopter, marked, and collared, including the ones captured last week. They will be monitored along with moose collared in 2015 and 2016. These cow moose are tracked by satellites that download their locations daily. If any of these monitored moose die, their collar sends a special mortality signal so the carcass can be located. To date, over 100 moose carcasses have been examined, and have yielded vital information to wildlife biologists—for example, the major sources of mortality are trauma and parasites—the most problematic ones being the deer brainworm (*Parelaphostrongylus tenuis*) and giant liver fluke (*Fascioloides magna*).

The Cornell Wildlife Health Lab is working with a variety of institutions to determine and assess the New York moose population. These include the NYSDEC, SUNY-Environmental Science and Forestry, New York Cooperative Fish and Wildlife Research Unit, Wildlife Conservation Society, and Biodiversity Research Institute. To learn more about the project, visit: <http://ny-moose.weebly.com/>

A moose that has been temporarily captured for tagging and data collection
Image Courtesy of David Rivers, Native Range Capture Services, capture crew pilot



Image Courtesy of David Rivers, Native Range Capture Services, capture crew pilot

Watch a video of the "moose mugging" helicopter here: <https://youtu.be/Ul16zjbnRY>

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Commentary

A case for Planetary Health/GeoHealth

[Amalia A. Almada](#), [Christopher D. Golden](#), [Steven A. Osofsky](#), [Samuel S. Myers](#)

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This article was corrected on 25 APR 2017. See the end of the full text for details.

Abstract

Concern has been spreading across scientific disciplines that the pervasive human transformation of Earth's natural systems is an urgent threat to human health. The simultaneous emergence of “GeoHealth” and “Planetary Health” signals recognition that developing a new relationship between humanity and our natural systems is becoming an urgent global health priority—if we are to prevent a backsliding from the past century's great public health gains. Achieving meaningful progress will require collaboration across a broad swath of scientific disciplines as well as with policy makers, natural resource managers, members of faith communities, and movement builders around the world in order to build a rigorous evidence base of scientific understanding as the foundation for more robust policy and resource management decisions that incorporate both environmental and human health outcomes.

1 Introduction

What does it really mean to us that 2016 was Earth's warmest year on record [National Oceanic and Atmospheric Administration (NOAA), 2016], that the animals that pollinate plants are disappearing worldwide [Potts et al., 2010], that atmospheric carbon dioxide levels are rising at a record pace [NOAA, 2017], and that we use about half of the planet's livable surface to feed ourselves [Foley et al., 2007]? We are increasingly bombarded by overwhelming facts that are difficult to rationalize and whose scales are incomprehensible within our daily lives. Yet the truth is that these unprecedented changes in our global environment have dramatic and tangible implications for our health and that of our children. Development and innovation in manipulating the environments around us have led to tremendous improvements for human health and livelihoods in much of the world—consider the prevention of widespread food shortages and famine predicted in the 1960s made possible by the “Green Revolution” where the combination of expanding land cultivation, synthetic fertilizers, irrigation, mechanization, and development of high-yielding crop hybrid varieties allowed a dramatic explosion in global food production [Pingali, 2012]. Consider how malaria death rates around the world were reduced by half between 2000 and 2015, declining fastest among children through the intentional removal of mosquito breeding habitats along with the increased use of pesticides and bed nets [WHO and UNICEF, 2015]. And consider how mortality rates due to heat waves, the deadliest type of severe weather event in the United States [NOAA, 2013], have declined with help from technological innovations including air conditioning [Nordio et al., 2015] and improved heat forecasts and warnings.

Whether intentional or unanticipated, humanity's persistent sculpting of the environment, particularly by those in the developed world, has accelerated due to a combination of exponential human population growth and unsustainable consumption patterns and is now having impact at scales that are difficult to overstate. Most measures of human impact on ecological systems show similar patterns of a great acceleration, starting with a gradual rise at the start of the nineteenth century with a very steep rise in impact around 1950 and continuing today [Steffen et al., 2015]. These anthropogenic transformations include placing dams on roughly 60% of the world's rivers [World Commission on Dams, 2000], clearing nearly half of the temperate and tropical forests globally [WWF, 2016], and annually appropriating roughly one half of accessible freshwater for human uses [Pingali, 2012]. In short, we are remaking the fundamental characteristics of our life support systems: our global food production system, the quality of the air we breathe, the water we drink, our exposure to infectious disease, and even the habitability of the places where we live.

Concern has been spreading through the global health community that this pervasive human alteration of Earth's natural systems has become a threat to the health of humanity. There is growing recognition that the scale of these impacts, and their trajectory, are likely to drive the majority of the global burden of disease over the coming century [Whitmee et al., 2015]. The wheels are clearly already in motion, as we are increasingly encountering examples of the aforementioned environmental changes tangibly affecting our health: with consecutive “warmest” years on record, this year there is a devastating possibility of four famines breaking out at once due to drought—in Somalia, South Sudan, Nigeria, and Yemen—endangering more than 20 million lives [Gettleman, 2017]. Looking forward, the worldwide disappearance of the insects, birds, and mammals that pollinate plants and the subsequent loss in yield of essential food crops could cause up to 1.4 million excess deaths annually due to noncommunicable and malnutrition-related diseases inflicted by such dietary changes [Smith et al., 2015]. Other essential staple food crops grown under the elevated carbon dioxide levels anticipated for the middle of this century will have lower levels of protein, zinc, and iron, thereby pushing hundreds of millions of people worldwide into deficiencies of these nutrients, and worsening existing deficiencies among the roughly two billion people already affected [Myers et al., 2014]. In Indonesia, the use of fires to clear land for agriculture in just one year (2015) led to roughly 100,000 excess deaths of Indonesians, Malaysians, and Singaporeans from

cardiorespiratory disease associated with the related air pollution exposures [Marlier et al. , 2015]. These are the types of environmental change-driven mass-scale health impacts that are causing the health and environmental science communities to sound the alarm.

2 The Emergence of the “Planetary Health” and “GeoHealth” Fields

In recognition of these challenges, institutions around the world have started to respond. The Rockefeller Foundation was the first foundation to launch a series of strategic investments to catalyze the field of Planetary Health. By 2014, the Foundation and the medical journal *The Lancet* had formed The Rockefeller Foundation-Lancet Commission on Planetary Health to explore the scientific basis for creating this new transdisciplinary field at the intersection of accelerating global environmental change and human health. The Commission was composed of leading researchers and policy makers from academic, government, multilateral and civil society institutions across eight countries and released its “[Safeguarding Human Health in the Anthropocene Epoch](#)” white paper in mid-2015. With unplanned but powerful convergence, Pope Francis released his “On Care for Our Common Home” encyclical on environment and health around the same time [Francis , 2015]. In the meantime, the Wellcome Trust has developed a large research funding initiative called “Our Planet, Our Health: Responding to a Changing World” to fund pilot projects investigating the connections between environmental change and health; the University of Sydney has recently named its first Professor of Planetary Health, and other universities around the world are rapidly developing curriculum and training opportunities in Planetary Health; the first issue of *The Lancet Planetary Health* has just been released; the Rockefeller Foundation launched a “[Planetary Health Alliance](#)” to build a community of practice in planetary health education, research, and policy; the United Nations Framework Convention on Climate Change has recently announced a Planetary Health track, and the United Nations Environment Program and the World Health Organization have been collaborating on using a Planetary Health lens to address the Sustainable Development Goals.

In parallel, leaders in the ecological, earth, and space sciences including the Ecological Society of America, United States Geological Survey, and the American Geophysical Union have launched complementary initiatives (Earth Stewardship Initiative, Environmental Health Mission Area, GeoHealth Initiative, respectively) to foster scientific investigation of the drivers of environmental change at local-to-global scales and methods to mitigate impacts on human health. In August 2016, in an effort to support research rapidly emerging at the intersection of Earth sciences, ecology, and health sciences, the American Geophysical Union announced the launch of a GeoHealth initiative and journal. With its community's growing appreciation of the deeper insight that Earth and space science provides into health and disease in both people and ecosystems, AGU is investing considerable resources to support compelling research at this intersection.

The call to arms by leading institutions across scientific disciplines and much of civil society reflects a widespread recognition of the need for action-focused, transdisciplinary research at the intersection of human health and environmental change. The simultaneous emergence of “GeoHealth” and “Planetary Health” signals acknowledgement that this need will not be met by just a renewed focus on a topical area but will necessitate a new scientific field that will transcend our traditional approach to research in order to tackle intimidatingly complex problems. This emerging scientific field must be an applied science, and research must be designed in partnership with those decision makers whom we seek to assist, increasing genuine participation and the chances of policy uptake of science-based recommendations. This field aspires to inform policy at every scale from local to global, to provide the basis for natural resource managers to optimize human health and environmental stewardship objectives, and to educate a global public about implications of their decisions on Planetary Health/GeoHealth.

Creating what former Rockefeller Foundation President Judith Rodin described as “Public Health 2.0,” a “new operating system for health and the planet” [Rodin , 2015], will not be easy. Current constraints due to largely canalized research funding streams must be changed and the very intellectual structures of universities must be rethought, dismantling the divides between disciplines and fostering deeply integrated research and policy programs to tackle these complex questions and train the next generation of scientific as well as political leaders. The power unleashed by such a transdisciplinary approach and collaborative community is that we will be better equipped to handle the surprises that emerge as we begin to unravel the tightly interconnected web linking human health to natural systems. And there will, undoubtedly, be such surprises. For example, a recent study investigating the underlying factors causing an increase in preeclampsia and hypertension in pregnant women in coastal communities in Bangladesh observed higher disease risk in those women drinking high salinity groundwater [Khan et al. , 2014] caused, in part, by the intrusion of salt water with sea level rise. The dynamic and unanticipated health challenges posed by environmental change are not just intellectual curiosities, but a matter of life and livelihood. The hardest-hit countries tend to be the poorest and are often not the primary drivers of environmental change but nonetheless are burdened by the downstream consequences of the consumption patterns of developed countries. These inequities are not confined to the developing world—vulnerable communities exist in many developed countries—or to those of us on Earth today; the sheer immorality of the intergenerational inequities that implicitly accompany today's mismanagement of the planet's natural systems is clear.

3 Where We Are Going

The proposition that human disruption of Earth's natural systems represents a threat to human health is not a new idea [see Hippocrates , 400 Before Common Era]. Pioneers in the fields of conservation medicine, One Health, and EcoHealth have articulated versions of this concept and constructed an impressive edifice of understanding about the human health impacts of climate change, biodiversity loss, land use change, nutrient enrichment, urbanization, and many other ongoing anthropogenic environmental changes. What may be different about the emergence of Planetary Health and GeoHealth is that the scale of human disruption of Earth's natural systems has reached a level where it threatens to drive the majority of the global burden of disease. Mainstream scientific communities are embracing the Planetary Health/GeoHealth framework out of recognition that it is becoming an urgent global health priority to develop a new relationship between humanity and our natural systems—if we are to prevent a backsliding from the past century's great public health gains.

Achieving meaningful progress along this new trajectory will require collaboration across a broad swath of scientific disciplines as well as with policy makers, natural resource managers, members of faith communities, and movement builders around the world. Only through forging this collaboration can we build a rigorous evidence base of scientific understanding as the foundation for more robust policy and resource management decisions that incorporate both important environmental and human health outcomes. Cultivating a new relationship between humanity and our natural systems ultimately requires collective behavioral change to minimize our demands on environmental resources, and this may well depend on a genuine societal epiphany: a healthy environment is the foundation for human health, for sustainable development, and for a future we would all like to see.

Erratum

In the originally published version of this paper authors Christopher D. Golden and Samuel S. Myers should have had Department of Environmental Health, Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA, added to their affiliations. Also, author Steven A. Osofsky should have had

Planetary Health Alliance, Cornell University, Ithaca, New York, USA, Department of Population Medicine and Diagnostic Sciences, Cornell University College of Veterinary Medicine, Ithaca, New York, USA added to his affiliations. These errors have since been corrected and this version may be considered the authoritative record.

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Conservation CSI: Cornell researchers solve mystery of mass turtle die-off

🐾 Monday, March 6, 2017 - 4:46pm

In April 2015, hundreds of diamondback terrapin turtles and tens of thousands of fish were found dead on a beach near Flanders Bay, Long Island. This threatened species has already experienced steep population declines around Long Island, and the unprecedented die-off had potential to impact the survival of the terrapin population in the area. Through collaboration with the New York State Department of Environmental Conservation (NYSDEC) biologists and a local wildlife rehabilitator, Cornell's Wildlife Health Program (WHP) researchers determined that saxitoxin, a potent neurotoxin from algal blooms, was behind the die-off; their discovery was published in the April 2017 issue of the journal *Toxicon*.



Turtles in trouble

Diamondback terrapins are the only turtle species that live in coastal salt marshes, and already face serious challenges. The species is listed as threatened or a “species of concern” in multiple states, and populations are declining—in Jamaica Bay, Long Island, one of the largest known populations has declined by 60% in recent years. That made the mass die-off all the more concerning for scientists. “A turtle die-off of this scale is a significant concern,” says Dr. Elizabeth Bunting, WHP director and senior extension associate with the Cornell University College of Veterinary Medicine. “The first step to preventing it from happening again is to pinpoint the cause.”

An unusual suspect

At the same time the terrapins were turning up dead, the NYSDEC closed the shellfish beds around the bay due to an algal bloom which was producing a potent neurotoxin known as saxitoxin—at levels that were the highest ever recorded in the area. Shellfish concentrate the toxin and are a human health concern if consumed, in turn creating an economic impact on commercial and recreational shellfish harvesting in temperate coastal water systems. “This algal bloom was a red flag,” says NYSDEC Biologist Kevin Hynes. “We immediately wondered if it was also the cause of the turtle deaths.”

Karen Testa, a rehabilitator at Turtle Rescue of the Hamptons, Inc., collected and submitted over 25 terrapins for examination to the WHP and the NYSDEC. The terrapins were examined by WHP staff including pathologist Dr. Rob Ossiboff and Hynes. Others were necropsied on Long Island by the Riverhead Foundation and Dr. Chris Gobler's lab at SUNY Stonybrook. No turtles had any physical evidence of disease or trauma. The animals were also tested for

ranavirus, a common cause of mortality events, but results were negative—which added to the case that saxitoxin was to blame. However, because a saxitoxin-caused mortality in a temperate turtle species had never happened before, the scientists had to ensure the evidence was indisputable. “We had to show with a high degree of certainty that the toxin was present in the animals’ tissue, and that the animals were exposed from eating the local shellfish,” says Hynes.

Case closed

The WHP and Goble’s lab tested for saxitoxin in the terrapin tissue, while also collecting and identifying the turtle’s gut contents in order to identify the species of shellfish found in the affected turtles. The results confirmed the scientists’ suspicions—the saxitoxin was present in the turtles’ tissues, as well as the corresponding local mussel species in the stomach contents. “Although more information regarding the effect of saxitoxin on reptiles is still needed, we concluded that saxitoxin was the likely cause of the deaths of hundreds of diamondback terrapins in Flanders Bay, Long Island,” says Bunting. “The impact on this fragile and declining population from this event may threaten the survival of the species in this area.”



TO SEE THE CONCEPT OF ONE HEALTH IN ACTION IS REMARKABLE. IN ORDER TO HELP ENDANGERED SPECIES, IT REALLY DOES TAKE A VILLAGE, AND MY EXPERIENCE WITH BOYS AND GIRLS HAS GALVANIZED MY DESIRES TO WORK IN THIS FIELD!
-NACOLE LUTZ, DVM, MS

THIS SUMMER, MARICARMELA GARCIA '16 DELIVERED A CHAMPIONSHIP WORKING AT THE JUAN GONZALEZ INSTITUTE'S CHIROPYANCA CHIROPYANCA REHABILITATION CENTER IN THE REPUBLIC OF CONGO AS PART OF A LEARNED CONSERVATION MEDICINE PROGRAM (CCMP) COLLABORATION, THE ANIMAL SCIENCES MAJOR HELPED CARE FOR 'YAKA, A SEVERELY MALNOURISHED FEMALE. "AFTER A WHILE, YAKA BECAME VERY ATTACHED TO ME," GARCIA RECALLS. "SHE WOULD GRAB MY TOE, GIVE ME HER SPECIAL CHIMP GREETING, AND SOMETIMES TAKE NAPS ON MY LAP. IT WAS A TERRIFIC EXPERIENCE THAT I WILL NEVER FORGET."

THANKS TO THE GOAL OF A SEVERELY MALNOURISHED FEMALE AND HER DEDICATED CAREGIVERS WHO HELPED HER RECOVER AND RETURN TO THE WILD, GARCIA HAS A NEW GOAL: TO BE A VETERINARY MEDICINE MAJOR AND WORK IN THE FIELD OF WILDLIFE CONSERVATION.

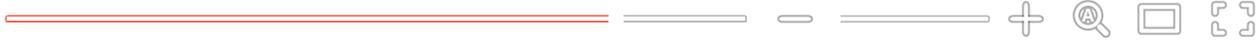
THE COLLEGE OF VETERINARY MEDICINE IS THE LEADER IN THE FIELD OF WILDLIFE CONSERVATION AND RESEARCH. THROUGH THE LEARNED CONSERVATION MEDICINE PROGRAM (CCMP), WE OFFER A SEVERAL OPPORTUNITIES FOR STUDENTS TO GAIN EXPERIENCE IN THE FIELD OF WILDLIFE CONSERVATION AND RESEARCH.

WORKING EARLY AND LEARNING FROM THE BEST IN THE FIELD IS AN ESSENTIAL PART OF THE CCMP EXPERIENCE. THIS SUMMER, GARCIA WAS ABLE TO WORK WITH AN EXPERT IN THE FIELD OF WILDLIFE CONSERVATION AND RESEARCH, DR. JUAN GONZALEZ, WHO HAS BEEN WORKING IN THE FIELD OF WILDLIFE CONSERVATION AND RESEARCH FOR OVER 20 YEARS.

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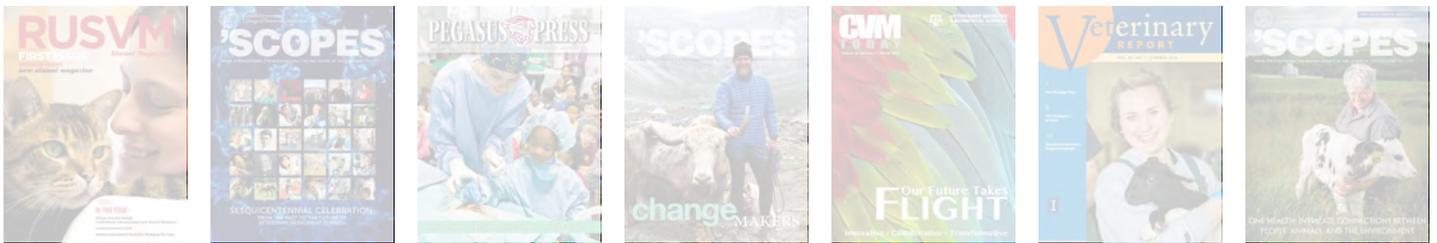


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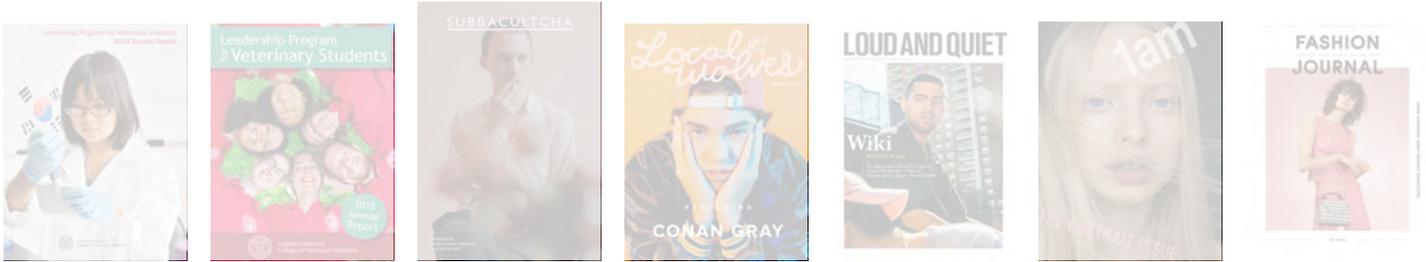


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'Win-win' for wildlife, African farmers stems from partnership

By Krishna Ramanujan | December 13, 2016

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M. Atkinson/AHEAD

The KAZA Transfrontier Conservation Area is home to close to half of elephants remaining on Earth.

Namibian farmer Robin Lyonga was hoping to sell his cattle to an accredited slaughterhouse that exported meat for a good price. He planned to sell off part of his herd to help his brother get training for a better-paying career.

But then another herder's cow many miles away developed foot-and-mouth disease, forcing the slaughterhouse to shut down. Lyonga's animals were quarantined, and all cows in the area were declared ineligible for sale.

Such issues arise from international policies for managing animal diseases that go back more than half a century and emphasize the geographic origin of livestock to try to prevent trade of meat infected with foot-and-mouth disease.

The viral foot-and-mouth disease – which doesn't infect people but can sicken livestock and is a concern when it comes to meat trade – is spread largely via contact between livestock and African buffalo, natural hosts of the virus that don't get ill from it. To limit such contact, thousands of miles of fencing have been built through southern African wildlife areas since the late 1950s, often with subsidies from international donors. These fences cut off the natural migration routes of wild animals and have led to the deaths of millions of them over the last 70 years.

Now, international animal health and wildlife conservation officials, brought together by a professor from the College of Veterinary Medicine, have worked to develop a new approach that focuses on safe guidelines for meat processing

to ensure the disease-free status of products, and reducing the need for fences.

“Today, wildlife is increasingly an engine for the region’s economic growth,” said Steve Osofsky, D.V.M. ’89, the Jay Hyman Professor of Wildlife Health and Health Policy, who prior to joining Cornell in July has been working on wildlife policy issues in southern Africa for more than 20 years.

“Unlike during the colonial era, when wildlife was seen to have little value, nature-based tourism today contributes as much or more to the gross domestic product of many southern African nations as agriculture, forestry and fisheries combined,” Osofsky said.

In the last decade, Angola, Botswana, Namibia, Zambia and Zimbabwe established the 500,000-square-kilometer Kavango Zambezi Transfrontier Conservation Area, or KAZA TFCA, centered around the wildlife-rich Zambezi-Okavango-Chobe-Victoria Falls region. The KAZA TFCA is home to about 250,000 elephants, the majority of the world’s remaining elephant population.

In November the KAZA TFCA, in partnership with the Food and Agriculture Organization of the United Nations and Cornell, hosted a major regional forum in Zimbabwe to move toward implementing the new approach, called commodity-based trade.

“The door is open to a truly win-win opportunity both for livestock farmers and for tourism and related industries involved with transfrontier conservation areas,” Osofsky said.

Cattle that have been managed in accordance with an official foot-and-mouth disease control policy and then quarantined before slaughter may be considered safe for trade, provided that the meat (in the case of products not undergoing further value-added processing) is deboned, deglanded, properly aged (so the pH drops accordingly) and chilled before export.

“If livestock agriculture is no longer solely dependent on veterinary fencing, then KAZA’s vision for the restoration of major movement corridors for the region’s spectacular wildlife indeed has a chance of being realized,” he added.

STORY CONTACTS

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CVM's Hanley-Cassidy and Casey turn to schools across New York to keep invasive species at bay

🐾 Friday, February 24, 2017 - 12:23pm



Brooklyn students collect water samples to test for the presence of invasive species

Invasive aquatic species like round goby, Asian carp, and sea lamprey are a growing problem in New York State. Their presence impacts water quality, food supply, recreation and tourism, as well as human and animal health. Early detection is a critical first step in monitoring a species' spread and managing responses.

Scientists at Cornell University's College of Veterinary Medicine have devised genetic tests that can detect the environmental DNA (eDNA) of invasive species in a waterway before they become established there. But there are more than 7,600 freshwater lakes and ponds and over 70,000 miles of rivers and streams in New York State, all of them potential conduits for the unwelcome species. How can the Cornell team watch them all for signs of a potential invasion?

The answer: teams of young citizen scientists from schools located near a lake, river, or creek, who gather water samples to send to Cornell for analysis.

Dr. Donna Cassidy-Hanley, a senior research associate at the Cornell Veterinary College, had already worked with teachers across New York state to provide hands-on resources for teaching basic science. Teaming up with Cornell Professor James Casey, who developed the genetic tests, Cassidy-Hanley went back to those teachers with a new proposal: Engage your students in a hands-on research project with Cornell scientists that introduces them to invasive species, ecology, environmental management, and bio-informatics, and that has important real world impact.

The response has been amazing. “We had hoped to get five or six teachers involved in the pilot program,” says Hanley-Cassidy. “We currently have 60 teachers across the state.” Students at schools from New York City to small rural upstate towns have joined in the effort to monitor the spread of invasive fish, contributing critical data and learning about science firsthand.

Cornell sends participating classes free kits containing everything needed to collect water samples. Sample collection starts in the spring as soon as the ice melts and continues until the waters freeze in the fall. Cornell shares detailed test results with teachers and students as soon as the analyses are complete, providing a platform for further learning and discussion. Some classes travel to Cornell to see the laboratory where their samples are tested.

Casey is impressed with the quality of the samples. “I was surprised at how well the program works,” he says. “Round goby have been identified at 38 separate sites across the state, including two sites in areas where round goby had not previously been found.” The program is supported in part by a USDA HATCH grant, which covers activities in New York state. Word is spreading and teachers from other states are expressing interest in the possibility of similar program,

The feedback from teachers and students is very encouraging. Student interest is high, even among students with little past interest in science, and extracurricular groups like ecology clubs have become involved. “Activities like this can have a game changing influence on attitudes and interests,” Cassidy-Hanley says. “Seeing firsthand how invasives can affect fishing and boating, as well as the environment and the economy, helps students understand that science has a real impact on daily life.”

Maps that show participants and test results across the state can be seen by visiting <https://tetrahymenaasset.vet.cornell.edu/invasive-fish-program/edna-testing-results/>. The map on that page is not interactive, but the four species-specific links above it connect to maps that are.

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CVM team cares for native species at Belize Zoo

🐾 Monday, March 20, 2017 - 9:57am



Students at the Cornell University College of Veterinary Medicine can get an idea of what it's like to care for wild animals, thanks to a partnership between the college and the Belize Zoo and Tropical Education Center in Central America. By working with clinicians in the zoo's animal hospital, the students also contribute to efforts to save some species from extinction.

The Belize Zoo focuses exclusively on native species, exhibiting 170 animals representing 45 species, many of them at risk of extinction. The zoo doesn't capture wildlife for its collection. Instead, animals arrive as orphans or rescues, or are treated at the zoo's hospital for illnesses or injuries that preclude releasing them back into the wild.

The zoo also takes in "problem jaguars" that threaten or prey on domestic animals. In addition to providing veterinary care, the zoo emphasizes conservation and public education. The goal is to encourage Belizeans to take pride in their native species, so they will want to protect them and the habitats that sustain them.

Cornell's partnership with the zoo began in 2011, when wildlife medicine professor George Kollias began taking students to Belize as part of a zoological medicine course.

"The Belize Zoo offers wonderful opportunities for veterinary students," says Kollias. "Exposure to wildlife native to Central America provides a clinical experience they could not acquire anywhere else. It also helps to ensure the health and well-being of some of the most endangered animals on our planet."

"Working with Cornell Vet School has provided the Belize Zoo with invaluable opportunities," says zoo founder Sharon Matola, citing "quality vet attention for our special zoo animals and superb training opportunities for our animal management staff."

Kollias and professor Santiago Peralta took the partnership to the next level in 2016, when they received a two-year grant from the John T. and Jane A. Wiederhold Foundation. The grant supports a project comprising four trips to the zoo for a week of hands-on clinical experience and instructional activities. The Belize Zoo provides housing, all meals, local transportation and an opportunity to work with and learn from a dedicated and hard-working Belizean staff.

Each team consists of faculty members; residents training to specialize in zoological medicine, dentistry and oral surgery, or anesthesiology; veterinary students; and a member of the veterinary technical staff. Peralta specializes in veterinary dentistry and oral surgery.

Some zoo animals "have diseases and conditions that are known to cause pain and discomfort," says Peralta. "The prevalence of those conditions may be high. Some have severe dental and maxillofacial injuries. The zoo staff is critical for identifying the animals that require our specialized care." An animal who is in pain may have difficulty eating or may not eat at all. "We're really impacting the animal's welfare and gaining a lot of additional knowledge," he says.

"Zoo animals get a lot of the same diseases as domestic animals," says Kollias. "Because management practices have improved at zoos in general, animals are living longer in captivity. This aging population results in more geriatric problems such as dental issues, musculoskeletal problems such as osteoarthritis, kidney disease, liver disease and cancer. Many zoo animals now live much longer in captivity than they would have in the wild." Jaguars in the wild may live to be 13 to 15 years old, but the Belize Zoo had one that lived to be 24.

One major difference between wildlife and domestic animals is the much higher level of stress wild animals experience in a visit from the veterinarian. "Unless animals are conditioned or trained, physical exams or blood collection may be difficult or require general anesthesia, and if they are newly acquired from the wild there is no medical history," Kollias added. "The work is challenging and we've had great successes. For us and for our students, it's inspiring and fulfilling."

Cornell DVM student William Fugina went to Belize this winter and is ready to go back. "I had a spectacular experience that was truly life changing," he says. "I have never been more proud and excited to become a veterinarian than after witnessing the collaboration of such brilliant minds in treating these animals."

"I hope to return to the Belize Zoo someday with more skills to help promote the amazing ongoing mission," says classmate Zack Dvornicky-Raymond. "I definitely want to find ways throughout my career to do similar trips to other conservation institutions around the globe."

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\$1.7M grant from Rockefeller Foundation paves way for Planetary Health at Cornell

🐾 Wednesday, May 10, 2017 - 11:57am



Photo: Mark Atkinson

ITHACA, N.Y. – The Cornell University College of Veterinary Medicine (CVM) is excited to announce \$1.7 million in grant funding from The Rockefeller Foundation for work in support of the [Planetary Health Alliance](#), a consortium developed with Harvard University’s T. H. Chan School of Public Health. Planetary Health is a field born out of the urgent need to improve our understanding of the public health impacts of human-caused environmental change, so as to be able to inform land- and ocean-use planning, environmental conservation, and public health policy. The Planetary Health Alliance (PHA) emphasizes using sound science to fuel policy and action in order to secure a future for the health of human civilization and the state of the natural systems upon which it depends.

CVM has a suite of research, policy, outreach and educational programs underway focused on how human health, wildlife health, domestic animal health, and the health of the environment are all inextricably linked. For example, [CVM is working closely with southern African partners](#) to address diseases impacting the 200,000 square mile Kavango Zambezi Transfrontier Conservation Area (also known as “KAZA”), the largest land mass dedicated to wildlife conservation as linked to sustainable development in Africa if not the world. A collaborative effort among Angola, Botswana, Namibia, Zambia and Zimbabwe, the area is home to spectacular wildlife, including approximately

250,000 elephants, likely more than half of all of the elephants left in Africa. Addressing disease issues of importance to the international trade of beef from local cattle is critical here in order for wildlife and livestock to finally be able to peacefully coexist. The Rockefeller Foundation is supporting CVM's efforts to ensure the poorest livestock farmers living closest to wildlife are no longer excluded from global beef markets, and veterinary cordon fencing, which has devastated wildlife for decades by blocking key migration routes, is no longer the only option for managing foot and mouth disease in southern Africa.

"If livestock agriculture is no longer solely dependent on veterinary fencing to deal with foot and mouth disease, then KAZA's vision for the restoration of major movement corridors for the region's spectacular wildlife indeed has a chance of being realized," said Steve Osofsky, the Jay Hyman Professor of Wildlife Health & Health Policy at CVM, who leads the work. "In addition, by producing meat in a way that solves the foot and mouth virus problem, livestock farmers previously excluded from accessing markets may for the first time be able to find traction in the wider regional economy, and beyond. This can only help families move out of poverty and improve prospects for healthier lives and sustainable livelihoods."

CVM is looking at a range of other Planetary Health case studies to document how science can best serve the needs of policy makers around the world. For example, Rockefeller Foundation-supported research led by PHA partners at Harvard and Columbia universities on the connections between the emissions generated by the intentional burning of lowland forests to clear land for palm oil production in Indonesia and downwind population health impacts has facilitated an important opportunity to help protect both Indonesia's remaining forest and public health at the same time. CVM and PHA have also been engaging the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) to discuss the benefits of a Planetary Health approach and how our understanding of the critical range of relationships between the state of natural ecosystems and human health can inform the implementation of the Sustainable Development Goals.

Cornell University is also taking advantage of lessons learned from this very applied work to inform the world's first degree-granting program focused on Planetary Health. Cornell's new Master of Public Health (MPH) program will have its inaugural class starting in September, with an initial focus on sustainable food systems and on how better stewardship of the world's remaining ecosystems can potentially be a cost-effective "upstream" approach to protecting public health.

"For more than 100 years, The Rockefeller Foundation has been committed to human health and well-being, and to supporting the institutions and leading thinkers who are driving progress," said Michael Myers, Managing Director for Health at The Rockefeller Foundation. "Today, we can't think of human health without considering the health of our planet. Cornell's College of Veterinary Medicine and the Planetary Health Alliance are at the forefront of building the new and very applied field of Planetary Health. We are pleased to support their work."

Cornell University College of Veterinary Medicine is a global leader, with a mission to advance veterinary medicine at the interface of discovery and application. We promote research at the molecular, cellular, organismal, and population levels to better inform the practice of medicine, public health, and policy. We are dedicated to excellence in research, educational programs and professional service. We seek to advance understanding of both animal and human health, foster open collaboration across disciplines and institutional boundaries, and integrate discovery with application. To learn more, please visit <https://www2.vet.cornell.edu>.

The Planetary Health Alliance, based at Harvard's T. H. Chan School of Public Health, is a consortium of universities, NGOs and other partners with a shared mission—supporting the growth of a rigorous, policy-focused, transdisciplinary field of applied research aimed at understanding and addressing the human health implications

of accelerating anthropogenic change in the structure and function of Earth's natural systems. To learn more, please visit <http://planetaryhealthalliance.org/>.

For more than 100 years, The Rockefeller Foundation's mission has been to promote the well-being of humanity throughout the world. Today, The Rockefeller Foundation pursues this mission through dual goals: advancing inclusive economies that expand opportunities for more broadly shared prosperity, and building resilience by helping people, communities and institutions prepare for, withstand, and emerge stronger from acute shocks and chronic stresses. To achieve these goals, The Rockefeller Foundation works at the intersection of four focus areas—advance health, revalue ecosystems, secure livelihoods, and transform cities—to address the root causes of emerging challenges and create systemic change. Together with partners and grantees, The Rockefeller Foundation strives to catalyze and scale transformative innovations, create unlikely partnerships that span sectors, and take risks others cannot—or will not. To learn more, please visit www.rockefellerfoundation.org.

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