ENDANGERED SPECIES

Endangered Doesn't Have to Lead to Extinct – Advancing Wildlife Health to Save Species

Since 1965, Morris Animal Foundation has invested $24 million in more than 600 wildlife health studies, many of which focus on endangered species. While it is known that these animals face multiple threats such as climate change, poaching and habitat destruction, our Foundation is dedicated to combating lesser-known but equally important challenges. These include emerging diseases, environmental exposures and spillover infections – missing pieces necessary to help solve the conservation puzzle.

ENVIRONMENTAL EXPOSURES

Environmental exposures occur when animals encounter toxic chemicals in their environment, such as through industrial pollution or lead shot used in hunting. These exposures can lead to both serious immediate or delayed health problems in animals, as well as contaminate the habitats they rely on for food and shelter.

SPILLOVER INFECTIONS

Spillovers are phenomena where a virus, or other pathogen, moves from one species to another, one which has little to no previous exposure to the pathogen, and therefore, little immunity. This is a growing problem in wildlife and can devastate animal populations.

EMERGING DISEASES

Emerging diseases are infections that have recently appeared or rapidly increased in a population or geographic area.

MORRIS ANIMAL FOUNDATION RESEARCH PAST AND PRESENT

GORILLAS IN RWANDA

In the mid-1980s, fewer than 300 wild mountain gorillas remained in the world. Along with the serious injuries inflicted by poachers, researcher Dian Fossey believed human illnesses were spilling over into this fragile population. No health program existed to treat these sick and injured gorillas. The situation was dire.

Morris Animal Foundation accepted the challenge and helped establish the Volcanoes Veterinary Clinic in Rwanda, a decade-long project. We funded the construction of the clinic, helped hire and train the first gorilla doctors, and supported development of an animal health management plan.

Today, there are almost 900 mountain gorillas, the only great ape species with an increasing population. The clinic is a shining example of active conservation for a critically endangered species, and a model for other conservation programs. Without Morris Animal Foundation, it would not have been possible.

SAIGA IN ASIA

Saiga is a critically endangered antelope species native to central Asia that is historically believed to have roamed the earth at the same time as woolly mammoths. Unfortunately, without intervention, these unique animals face extinction as they have fallen victim to an epidemic of goat plague. This highly contagious virus, known to scientists as *peste des petits ruminants* (PPR), is typically associated with sheep and goats. It recently emerged in livestock in Mongolia and Kazakhstan before spreading to the saiga population.

In response to two separate outbreaks, Morris Animal Foundation turned to its Betty White Wildlife Rapid Response Fund. The fund provides wildlife researchers emergency monetary aid to respond to unexpected events, such as natural disasters and emerging diseases, which result in the need for immediate animal health research funds.

The aid was used to provide important training to wildlife managers, such as how to document and analyze results in deceased animals and how to monitor and survey other plains and mountain ungulates, including ibex and argali sheep.

RUSSIAN TIGERS

Since 2010, Morris Animal Foundation has joined with veterinarians from around the world to stop canine distemper virus infections in exotic species. The disease is a growing health challenge that is spilling over into different species of animals and placing many of them, such as tigers, at risk.

Morris Animal Foundation-funded researchers recently completed a study examining the threat of the virus in Siberian tigers. Their work on the transmission and perpetuation of the virus in tigers resulted in several recommendations and strategies to limit the spread of infection in large wild cats.

JAVAN RHINOS IN INDONESIA

With fewer than 45 individuals left worldwide, the Javan rhinoceros is thought to be the rarest large mammal on earth. One of their greatest current threats comes from the tabanid fly, which is responsible for transmitting a deadly blood parasite to mammals.

Researchers funded by Morris Animal Foundation are in a race against time to determine the exact role the flies play in disease transmission, their infection rates and how they choose their hosts. If successful in stopping the ongoing transmission of this blood parasite, we may be able to save the Javan rhino in the wild.

RIDGWAY'S HAWKS IN THE DOMINICAN REPUBLIC

With fewer than 400 birds remaining in the wild, the Dominican Republic's Ridgway's hawk is one of the most critically endangered raptors in the world. Numbers are steadily decreasing due to an infestation of botflies; whose larvae act as internal parasites. This seriously reduces the number of fledgling hawks each year.

The Foundation recently funded two studies to address this problem. One follows the flies themselves, such as their lifecycles and the full impact of their parasitism, to design improved control measures. The other study tests a long-acting pesticide, similar to a common flea and tick insecticide, applied to nests prior to egg laying. This work has dramatically increased the number of fledgling hawks, helping to save this species.

LOOKING FORWARD

Historically, major threats to wildlife as perceived by the public constituted preserving habitat and instituting anti-poaching measures. Today, we know wildlife also face complex health challenges brought on by the spillover of disease, climatological pressures that open new markets for vector-borne diseases, global travel that erases geographical isolation and protection, and the interplay on the edges of ecosystems among wild, domestic and human populations.

New threats to endangered species include viral cancers, fungal infections threatening amphibian populations globally, viability of re-establishing populations from small breeding programs, and other difficult-to-solve challenges that require us to be both creative and diligent.

UNDERSTANDING INFERTILITY IN BLACK-FOOTED FERRETS

Black-footed ferrets narrowly avoided extinction in the 1980s when only 18 individual animals were left to repopulate the entire species. Today, the black-footed ferret is making a comeback, but remains at risk of extinction partly due to multiple fertility challenges. This is likely related to the loss of genetic diversity and the possible presence of damaging mutations due to the small number of animals used to re-establish the species.

Researchers are using genomic tools to understand the causes of infertility in endangered black-footed ferrets. Identifying genetic features limiting reproductive function will aid in continued conservation measures to help this species thrive in the wild.

SAVING FROGS FROM DEADLY FUNGAL DISEASE

In the last few decades, more than 90 known frog species have become extinct and hundreds more species are in decline due to chytridiomycosis, a deadly fungal disease rapidly spreading throughout the world. One cause of the disease's high mortality rate is the immunosuppressing substances produced by the fungus, which prevent the frogs from acquiring long-lasting immunity.

Morris Animal Foundation-funded researchers are investigating the potential of a novel gene-silencing technique to interfere with the immunosuppressant activity of the fungus. The findings from this study will be used to discover ways to help boost the immunity of frogs impacted by this deadly disease and may help save further species from extinction.

FACIAL TUMORS IN TASMANIAN DEVILS

Since 1996, devil facial tumor disease (DFTD) has decimated 95 percent of the Tasmanian devil population. The disease is a highly unique form of transmissible cancer that is passed from one devil to another through biting, a common behavior that takes place during feeding and mating. Primary tumors typically develop on the face or inside the mouth, and quickly grow into large tumors that spread to the internal organs.

Morris Animal Foundation has funded a handful of studies to address this issue, but now a new, contagious cancer, devil facial tumor 2 (DFT2), was recently discovered among Tasmanian devils. The disease arose independently from DFTD, in different populations, but both cancers are spread the same way. The new disease causes large and debilitating tumor growths around the face and neck.

Morris Animal Foundation is funding researchers to determine how these unusual tumor cells can spread between individuals without triggering an effective immune response by infected devils. Understanding how DFT2 is evolving and spreading will provide important clues on how to manage this disease and other contagious cancers affecting Tasmanian devils.

SMITHSONIAN PARTNERSHIP

To help address critical health issues, and cultivate the finest wildlife veterinarians of tomorrow, Morris Animal Foundation and the Smithsonian Global Health Program (SGHP) collaborated to establish the Morris Animal Foundation and Dennis and Connie Keller Director of Training at SGHP. The position is responsible for national and international training programs in wildlife veterinary medicine. Morris Animal Foundation has dedicated $700,000 over seven years to fund the position.

The first person to fill this role is Dr. Lindsey Shields, DVM, DACVPM. In addition to her other duties, she supervises four to eight trainees every year, including veterinary students and veterinarians, from countries around the world as well as the United States. Trainees conduct research focused on a wildlife health issue based on the program's priorities and the trainee's background. They work on projects in both Africa and Asia and participate as teachers in workshops and in the individual training of other wildlife researchers during their program.

This partnership leverages the Foundation's funding and the Smithsonian's expertise to multiply our collective impact to save animal lives.

With your support, we can improve the lives of millions of wild animals, especially those facing extinction, around the world.

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