TESTIMONY
OF
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**Introduction and Overview of the National Zoo's Conservation Programs**

Thank you Chairwoman Bordallo and distinguished members of the Subcommittee for the opportunity to provide testimony to you today. My name is Steven L. Monfort and I am the Acting Director of the Smithsonian Institution's National Zoological Park. The National Zoo, in Washington, D.C., draws nearly 3 million visitors per year, and has over 40,000 member families of Friends of the National Zoo (FONZ). The zoo's website, supported by FONZ, receives more than 20 million visits annually from around the world. The Smithsonian Institution's museums and zoo teach millions of people each year in living classrooms, dedicate millions of dollars annually to education, conservation and scientific research programs and support over 130 conservation and research projects in more than 35 countries.

The Smithsonian Institution's professionals work collaboratively with other Federal and state agencies to help shape national and international wildlife conservation policy. They provide expert comment and input on such issues as migratory species, biological diversity, wildlife trade, endangered species, and species conservation. National Zoo staff also contribute their expertise to programs which advance animal care and welfare, identify emerging diseases, and educate students and the general public. In addition, the National Zoo is a member of the Association of Zoos and Aquariums (AZA) and actively supports their conservation initiatives, including the AZA Species Survival Plan (SSP) program.

All of these activities contribute to the same wildlife conservation goals which underlie H.R. 3086, the Global Wildlife Conservation, Coordination, and Enhancement Act of 2009. In my testimony today, I will summarize the National Zoo's programs, working closely with many partner agencies, non-governmental organizations, academic institutions, and other countries to conserve global wildlife resources. Specifically, I will relate these programs to the efforts underway to enhance the United States' ability to conserve global wildlife and biological diversity.

**Overview of the National Zoo's Conservation and Science Programs**

In its 2008 report to the U.S. Fish and Wildlife Service (USFWS) on expenditures for Fiscal Year 2008 for species listed as endangered or threatened under the Endangered Species Act, the National Zoo documented more than $1.1 million expended for 19 native species and 17 foreign species. These species included, among others, mammals like the Asian Elephant, Scimitar-horned Oryx, and Black-footed Ferret; birds like the California Condor, Micronesian Kingfisher, and Guam Rail; reptiles and amphibians like the Desert Tortoise and Panamanian Golden Frog; and marine Elkhorn Corals.

As an example of one of the stories behind these statistics for one of North America's most critically endangered species, from 1985 to 1987 the last remaining Black-footed Ferrets were removed from the wild in Wyoming for their protection. In 1988, the National Zoo's Conservation and Research Center (CRC), a 3,200-acre facility in Front Royal, Virginia, became the first zoo to receive ferrets, with seven individuals transferred from Wyoming's propagation facility. In the mid-1980s, the Zoo's reproduction team developed artificial insemination and semen cryopreservation techniques to sustain genetic diversity in the population. By 2008, the CRC had 33 ferrets in the SSP breeding program and had produced 533 young, 398 by natural breeding and 135 additional animals by artificial insemination. Two hundred of these CRC-produced animals have been released into the wild, part of the total wild population now estimated at approximately 1,000 individuals. In 2009, another 41 young were born, with 39 surviving. Two females became pregnant and produced young through artificial insemination, including the first successful use of cryopreserved semen, which came from one of the original 1988 founder males.

The programs to conserve these species are undertaken by National Zoo's staff based at the Zoo's 163-acre campus adjacent to Rock Creek Park, at the Zoo's Conservation and Research Center, and at field sites around the globe. Our effectiveness is greatly enhanced through partnerships with biodiversity and conservation scientists, social scientists, and educators across the Smithsonian. This work is guided by the Zoo's ten-year Science Plan, designed to achieve excellence in conservation biology. Conservation biology is a relatively young science that uses an interdisciplinary approach to address the challenges to sustaining biological diversity. By definition, conservation biology is value-driven, based on the premise that the conservation of species diversity, ecological systems, and evolutionary processes are important and benefit both current and future human societies. In recognition of the underlying importance of conservation biology to everything we do, the National Zoo will soon be combining its existing Conservation and Science and Animal Program Directorates as the Smithsonian Conservation Biology Institute. We will keep the Subcommittee informed about the progress of this change as it proceeds over the next few months.

Under the new Smithsonian Conservation Biology Institute, our conservation, science, and animal management programs will be organized into six centers:

- the Center for Conservation Education and Sustainability, which helps protect global biodiversity by teaching conservation principles and practices;
- the Center for Conservation and Evolutionary Genetics, which specializes in genetic management of wild and captive populations, non-invasive DNA, ancient DNA, systematics, disease diagnosis, genetic services to the zoo community, and application of genetics to animal behavior and ecology;
- the Center for Species Survival, which conducts research in reproductive physiology, endocrinology, cryobiology, embryo biology, animal behavior, wildlife toxicology, and assisted reproduction;
- the Conservation Ecology Center, which focuses on recovering and sustaining at-risk wildlife species and their supporting ecosystems in key terrestrial and marine regions throughout the globe;
- the Smithsonian Migratory Bird Center, which studies Neotropical migratory songbirds and wetland birds, the role of disease in bird population declines, and the environmental challenges facing urban and suburban birds;
- and the Center for Wildlife Health and Wellbeing, which studies the environmental, medical, nutritional, and behavioral requirements of wild and captive animals.

In this testimony I will give examples of some of the programs undertaken by these centers and summarize how they relate to the specific areas outlined by the Subcommitee.

**1) The importance of providing technical assistance, building capacity, and coordinating with range states as part of strategic global wildlife conservation.**

The National Zoo is dedicated to furthering the education of current and future conservation professionals, including undergraduate and graduate students, scientists, resource managers, educators, industry representatives and staff of government and non-government organizations. For more than three decades, Smithsonian staff and research associates have offered specialized training courses, in the United States and at over 20 international locations, on global conservation topics. More than 5,000 professional conservationists from over 85 countries have taken part in these courses. These training courses are principally organized and conducted by the Zoo’s Center for Conservation Education and Sustainability, although Zoo staff from other centers also provide assistance in their particular areas of expertise.

Many of the participants from the Zoo's training programs now hold influential positions at government agencies, universities, and non-governmental organizations in their home countries. These conservation leaders have credited the Zoo’s capacity building efforts with contributing to many conservation accomplishments. These include, among others, the establishment of protected areas, development of public awareness and education campaigns, creation of organizational strategic plans, implementation of biodiversity monitoring plans, establishment of partnerships between the public and private sectors, acquisition of new technology, and completion of conservation research projects.

The need for training and capacity building continues to increase, as the world faces an unprecedented loss of biodiversity and multiple conservation challenges. Expanding human populations have led to fragmentation of habitats and greater levels of human-wildlife conflicts. The demand for any source of income in poorer communities, and for luxury goods in wealthier ones, has led to increased poaching of live animals, skins, feathers, teeth, claws, and bones. Subsistence hunting and growing networks of commercial poaching for meat have swept through Africa and now threaten both predator and prey species in Asia. The spread of invasive species has resulted in widespread habitat deterioration, and climate change poses an ever-growing threat to entire landscapes and ecosystems.

**Global Tiger Initiative and the Tiger Conservation and Development Network**

No species has been more affected by these trends than the Tiger, which has plummeted in the past century in its 13 Asian range countries from over 100,000 animals in the wild to less than 3,500 today, with the number still declining precipitously. The National Zoo has been involved with tiger conservation since the start of the Smithsonian-Nepal Tiger Ecology Project in 1973, and has chaired the Save the Tiger Fund Council since its inception in 1995, led by its Conservation Ecology Center. The Save the Tiger Fund is a partnership between the National Fish and Wildlife Foundation and the ExxonMobil Corporation which has guided the investment of about $1 million a year in conservation projects across Asia. In so doing, it has helped to create synergistic efforts among a variety of conservation organizations working to save Tigers in Asia. These projects have been undertaken in close coordination with the USFWS Rhinoceros and Tiger Conservation Fund, the World Bank, and a number of non-governmental organizations and academic institutions involved with Tiger conservation in range countries.

Building on this long history of Tiger conservation, in order to address the new crisis, in June, 2008, the Smithsonian joined with the World Bank Group, the Global Environmental Facility, the International Tiger Coalition, and a number of other partner organizations to launch the Global Tiger Initiative (GTI). The GTI has initiated a series of Tiger conservation actions designed to culminate in a “Year of the Tiger Summit” in Asia in 2010.

Furthermore, emphasizing the key role of capacity building as part of the GTI, in June, 2009, the Smithsonian and the World Bank announced the formation of a Tiger Conservation and Development Network. The Network will train senior conservation leaders and policy-makers as well as field rangers, foresters, and other habitat managers in the latest cutting-edge practices in biodiversity management, with a specific focus on preserving and increasing wild Tiger populations. The National Zoo’s Conservation and Research Center will serve as one of the initial launch-pads for the development of the Network. Over the next year, the World Bank will dedicate more than $1 million toward these training efforts, and the Smithsonian and World Bank will work to expand the alliance to include other members and raise additional financing.

**Smithsonian-Mason Partnership**

In addition, the National Zoo and George Mason University have also recognized the need for new partnerships to invest in the next generation of conservationists, wildlife practitioners, decision makers, and educators. The Zoo and George Mason have joined forces to develop a comprehensive academic program for undergraduates, graduates, and conservationists, also based at the Zoo's Conservation and Research Center. Multidisciplinary faculty from the Zoo and George Mason have launched the Smithsonian-Mason Conservation Education Program that will provide academic opportunities for up to 50 undergraduate and 10 graduate students per semester, and accommodate an additional 60 participants in the professional training and certificate programs. By leveraging the Smithsonian's internationally recognized researchers and collections with George Mason's ability to produce entrepreneurial education programs, we will together be able to produce conservation practitioners who can effectively address the very serious questions of the loss of global biodiversity facing our nation and our world.

Until the new facility is constructed, the Zoo and George Mason will continue with pilot Smithsonian-Mason Semesters for 15 undergraduates at a time, using the existing CRC Training Center. These students pursue an innovative conservation studies curriculum that emphasizes experiential learning and combines biology, environmental monitoring, public policy, human-wildlife conflict resolution, and environmental economics. The most recent pilot program was completed successfully in May of this year, with students now going on to conservation internships, preparations for graduate school, or permanent positions in the conservation field.

**2) The feasibility and implications of increased coordination between Federal, State, and non-governmental organizations and entities involved in wildlife conservation.**

It is clear to us in the National Zoo that we will never have enough resources to accomplish all of our global biodiversity conservation objectives alone, and we believe this applies equally to other conservation organizations and agencies. Partnerships, cooperation, and coordination of conservation efforts are essential to achieving these goals. I would like to highlight two of these partnerships – the Conservation Centers for Species Survival and our new Amphibian Conservation Project, each of which is led by scientists from the Zoo's Center for Species Survival.

**Conservation Centers for Species Survival**

The Conservation Centers for Species Survival (C2S2) is a consortium formed in 2005 of five conservation organizations which together control more than 25,000 acres, which is more than 70% of all of the land area managed by U.S. zoological institutions for endangered species research and recovery. C2S2 includes the National Zoo's Conservation and Research Center in Front Royal, Virginia; Fossil Rim Wildlife Center in Glen Rose, Texas; San Diego Zoo's Wild Animal Park in Escondido, California;

White Oak Conservation Center in Yulee, Florida; and The Wilds in Cumberland, Ohio. Over the past four years, C2S2 institutions have leveraged their unique resources, including vast space for large-scale conservation programs; flexible, innovative, and scientifically-focused approaches to conservation; and a well-established history of working together on a variety of conservation projects for globally threatened species. Special emphasis has been given to species which have been determined to be a priority for cooperative efforts by the USFWS and State wildlife agencies.

In May of 2009, the National Zoo's CRC hosted the annual meeting of the C2S2 group. Attending this meeting were not only representatives of the five member institutions, but senior leadership from the Association of Zoos and Aquariums; the USFWS Endangered Species, International Affairs, and External Affairs programs; the U.S. Geological Survey's Patuxent Wildlife Research Center; the National Fish and Wildlife Foundation's Bird Conservation Program; and the World Wildlife Fund's Asia Program.

Presentations and discussions during the meeting emphasized development of cooperative efforts for a wide variety of endangered mammals, birds, and reptiles. Fossil Rim Wildlif Center presented a report on its participation, with other C2S2 members, the USFWS and the Arizona Game and Fish Department in a meeting earlier this year at the Buenos Aries National Wildlife Refuge regarding international efforts to save the Masked Bobwhite Quail, a unique desert subspecies shared with Mexico. The San Diego Zoo, with active support from other C2S2 institutions, reported on its progress in taking over management of the USFWS Desert Tortoise Conservation Center in Nevada, at the request of the USFWS and the Bureau of Land Management. The CRC and the USGS Patuxent Wildlife Research Center reported on cooperative efforts, in conjunction with other C2S2 institutions, to enhance the scientific knowledge base for captive breeding and reintroduction into the wild of Whooping Cranes, as part of the International Whooping Crane Recovery Program and Whooping Crane Eastern Partnership. Other endangered species highlighted during the meeting included, among others, the C2S2 Cheetah Cooperative Management Program; Saiga and newly discovered Saola antelopes from Asia; Sahelo-Saharan antelopes and red-necked ostrich from North Africa; rhinos and other hoofed mammals from Africa and Asia; North American bats; and Attwater's Prairie Chickens in Texas.

**Smithsonian's Amphibian Conservation Program**

The world's amphibians are vanishing at an alarming rate. The International Union for the Conservation of Nature (IUCN) has judged that 42 percent of the world's 6,000 frog species are declining rapidly and at least 2,000 species are in danger of extinction. Since 1980, 122 amphibian species are thought to have gone extinct, compared to just five bird species and no mammals over the same period. This is an unprecedented rate of species loss and deserves an unprecedented conservation response. However, only a few years ago the amphibian research community collectively included just a handful of full-time conservationists in the world working to mitigate threats. This is clearly a dearth of capacity when compared to the thousands of full-time conservation workers focused on fish, reptiles, birds, and mammals.

The Smithsonian decided that it had a responsibility to help deal with this emerging problem, and it now employs two full-time amphibian conservationists, working at the National Zoo and the Smithsonian Tropical Research Institute in Panama, respectively. However, these two fulltime amphibian conservationists could not be expected to succeed without partnerships with other institutions. Thus the Zoo and Tropical Research Institute developed the Panama Amphibian Rescue and Conservation Project, a partnership with Africam Safari Park in Mexico, Cheyenne Mountain Zoo in Colorado, the Defenders of Wildlife, Zoo New England, and the Houston Zoo, with the goal of building capacity in Panama to respond to the global amphibian crisis.

The project will construct a facility to house captive populations of amphibians that are facing extinction due to a devastating, invasive amphibian pathogen, the Chytrid fungus (*Batrachochytrium dendrobatidis*), which was first demonstrated to be an agent of frog death by scientists from the Zoo in 1999. This fungus has now spread through all the mountainous regions of Central America except eastern Panama. In addition, we are collaborating with other scientists to develop a novel method to control the disease. We hope that this research may eventually allow us to reintroduce species which are extinct in the wild, such as Panamanian Golden Frogs or Wyoming Toads here in the United States, back into native habitats currently affected by the disease.

In addition to this project, Smithsonian scientists are making important contributions to amphibian conservation through their work on Appalachian salamanders, amphibian conservation breeding programs, taxonomy, monitoring, ecotoxicology, disease monitoring and public education. The Zoo has recently developed a new amphibian exhibit that is focused on educating visitors about declining amphibians and our work to mitigate amphibian extinctions.

**3) The ways in which the United States may improve the effectiveness and efficiency of global wildlife conservation.**

There are a host of activities which U. S. institutions can undertake to improve the effectiveness and efficiency of global wildlife conservation. Two areas which I would like to discuss today include the role of U.S. consumers in encouraging bird-friendly, shade-grown coffee, and the use of new scientific techniques for genetic analysis to support wildlife conservation decisions.

**Effect of Consumers on the Market for Bird Friendly Coffee**

American consumers and the choices they make can have a profoundly positive impact on wildlife habitat throughout the world. One of the premier examples of this is the marketing of third-party certified shade-grown coffee, which has been pioneered and championed by the Smithsonian Institution’s Bird Friendly Coffee program. Tropical deforestation loss has been one of the leading causes of the global loss of biodiversity and the decline in migratory birds. Countries in Latin America and the Caribbean, where over 150 species of North American birds spend the winter, count on exporting

agricultural products for foreign exchange, and millions of families depend on this income. There are clear limits to the amount of tropical lands that can be set aside in parks, so the conservation of biodiversity must also take place on privately owned and managed lands.

Coffee, one of the most important tropical crops, has been traditionally grown under a diverse shade canopy, providing many of the same ecological services as native forest. However, recent decades have brought a push towards modernizing coffee production by removing the shade canopy and adding many chemical inputs. These “sun” coffee farms are an ecological desert, whereas shade coffee farms are a refuge for biological diversity and our migratory songbirds.

Consumer demand for shade-grown coffee can help protect migratory birds and tropical biodiversity if coffee is clearly labeled and promoted in the marketplace. Since 1998, the Smithsonian Migratory Bird Center at the National Zoo has promoted “Bird Friendly®” coffee, an independently (third-party) certified shade grown coffee that is based on ecological criteria generated from peer-reviewed scientific research in coffee growing regions. All Bird Friendly® coffee is certified organic and is additionally inspected for a number of ecological variables related to the quality of the shade canopy. The coffee is certified Bird Friendly® by any of 14 USDA-approved organic inspection agencies at a marginal cost to coffee producers. Since 2001, our Migratory Bird Center has trained dozens of organic inspectors in the technical aspects of assessing shade coffee criteria.

The Smithsonian Bird Friendly Coffee seal is the most rigorous scientifically-based environmental certification of a tropical agricultural product, with many specialty coffee sector leaders calling it the “gold standard” in shade certification. The verifying paperwork can be traced from coffee plant to cup. Presently, 35 farms produce Bird Friendly® coffee in 11 countries, which is then channeled through 15 importers that supply about 45 to 50 retailers throughout the United States, Canada, Japan, and parts of Europe. While the total amount of Bird Friendly® coffee sold is still a relatively small portion of the coffee market, the underlying concept of promoting shade grown coffee has had enormous impact on the coffee industry, coffee growing countries, and the multi-lateral and bilateral agencies that work with farm families throughout the tropics. The “Coffee” link at the following website provides up-to-date information on the progress of the Bird Friendly® coffee movement: www.si.edu/smbc.

**Role of Conservation Genetics in Species Conservation**

The National Zoo’s Center for Conservation and Evolutionary Genetics has been at the forefront of research in the rapidly expanding field of conservation genetics. Our scientists were the first to analyze and document the loss of fitness caused by inbreeding in captive zoo animals, and took the lead in developing solutions such as software for genetic management. This involved developing methods of non-invasive genotyping (from scat, hair or other shed items) to identify species and individuals, and to estimate kinship and population sizes of animals in natural populations. We pioneered the application of ancient DNA protocols to issues of conservation importance, as well as to

unraveling the evolutionary histories of extinct and endangered species. Application of these molecular genetics methods has helped us diagnose and study the dynamics of emerging pathogens responsible for devastating wildlife diseases.

Use of these techniques can have profound effects on the conservation of many endangered species. For example, analyses of DNA from non-invasive samples (that is, dung) from African and Asian Elephants can identify individuals and document population sizes, movements, relatedness, and sex. In Gabon, we measured movements of elephants in response to human activities and stress, and showed that males somehow avoided mating with related females in Kenya's Amboseli National Park. Similarly, we have used DNA from scat to monitor survival, recruitment and inbreeding in African Wild Dogs reintroduced to their former range in South Africa. These highly endangered canids number fewer than 5,000, living in fragmented remains of their originally vast sub-Saharan range, and it is critical to monitor the success of reintroduction programs.

In Hawaii, we have been involved in a long-term study of Hawaiian birds threatened by introduced avian malaria. Use of DNA methods has identified the origins of the malaria parasite and its invasive mosquito vector and ancient DNA has determined when they likely arrived in Hawaii. Study of the genetics of the host has helped us learn how and why some native bird species have become more tolerant of the malaria than others. In the endangered Hawaiian Petrel, the amount of genetic variation that has been lost has been determined by comparing current levels of variation to variation in ancient DNA sequences obtained from subfossil bones. We are estimating the prehistoric (before human impacts) Petrel population size for use in models that predict changes in marine nutrients deposited by the Petrels in the nutrient poor ecosystems of Hawaii.

DNA fingerprinting methods have enabled us to assess the efficacy of translocation procedures for threatened Desert Tortoises in the Mojave Desert, enabling us to assess the recruitment of both male and female translocated tortoises into their new population. DNA analysis of blood parasites found in Pandas and related carnivores in North American zoos has allowed us to determine their taxonomy and origins, and to develop methods to accurately quantify the level of parasitism. Obtaining DNA sequences (barcodes) from museum specimens of Ivory-billed Woodpeckers from North America and Cuba has shown that the Cuban birds are very distinct from the North American birds. They may be a distinct species, and also provided sequences useful for comparison to items found by field biologists that may provide evidence of the existence of this "ghost bird".

**4) Conclusion -- The Global Wildlife Conservation, Coordination, and Enhancement Act of 2009.**

In summary, the Smithsonian Institution and the National Zoo support the overall conservation goals of the Global Wildlife Conservation, Coordination, and Enhancement Act of 2009. We believe that the kinds of activities being undertaken by the Smithsonian's National Zoo and its many partners that I have documented in this testimony are fully compatible with these goals. In addition, we are prepared to work cooperatively with the Subcommittee in any way that would be helpful to advancing these common objectives. The National Zoo will continue to enhance our ongoing partnerships with the USFWS, other Federal and State agencies, the Association of Zoos and Aquariums, our partners in the Conservation Centers for Species Survival as well as many other AZA member institutions, non-governmental organizations, and range countries in support of the conservation of global biodiversity.

Thank you for the opportunity to testify today on these critical conservation issues. I look forward to answering any questions you may have.