THE DEVELOPING CRISIS FACING WILDLIFE SPECIES DUE TO BUSHMEAT CONSUMPTION

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS

OF THE

COMMITTEE ON RESOURCES
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C O N T E N T S

	Page
Hearing held on July 11, 2002	1
Statement of Members:	
Gilchrest, Hon. Wayne T., a Representative in Congress from the State of Maryland	1
Prepared statement of	2
Underwood, Hon. Robert A., a Delegate in Congress from Guam, Prepared statement of	3
Statement of Witnesses:	
Agnagna, Marcellin, Chairman, CITES Bushmeat Working Group	30
Prepared statement of	32
Bakarr, Dr. Mohamed, Senior Technical Director, Center for Applied Biodiversity Science, Conservation International	72
Prepared statement of	75
Burnam, Jeffry M., Deputy Assistant Secretary of State for Environment, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State	3
Prepared statement of	5
Carroll, Dr. Richard W., Director, West and Central Africa and Madagascar Program, World Wildlife Fund	57
Prepared statement of	59
Graham, James A., Project Manager, Central Africa Regional Program for the Environment, U.S. Agency for International Development	18
Prepared statement of	19
Hutchins, Dr. Michael, Director, Department of Conservation and Science, American Zoo and Aquarium Association, and Co-Chairman, Bushmeat Crisis Task Force	38
Prepared statement of	39
Robinson, Dr. John G., Senior Vice President and Director, International Conservation, Wildlife Conservation Society	68
Prepared statement of	70
Stansell, Kenneth, Assistant Director for International Affairs, Fish and Wildlife Service, U.S. Department of the Interior	6
Prepared statement of	8
Additional materials supplied:	
Article "Bushmeat and the Origin of HIV/AIDS" submitted for the record	84
Article "Warfare on gorillas poses threat to survival" submitted for the record	90
Hoyt, Reginald, Senior Vice President, Conservation and Science, Philadelphia Zoo, Statement submitted for the record	93

OVERSIGHT HEARING ON THE DEVELOPING CRISIS FACING WILDLIFE SPECIES DUE TO BUSHMEAT CONSUMPTION

Thursday, July 11, 2002
U.S. House of Representatives
Subcommittee on Fisheries Conservation, Wildlife and Oceans
Committee on Resources
Washington, DC

The Subcommittee met, pursuant to notice, at 11:05 a.m., in room 1324, Longworth House Office Building, Hon. Wayne T. Gilchrest [Chairman of the Subcommittee] presiding.

STATEMENT OF THE HON. WAYNE GILCHREST, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MARYLAND

Mr. GILCHREST. The Subcommittee will come to order.

Good morning, everyone. Thank you all so much for being here. We are looking forward to the testimony this morning for this hearing on the present crisis in the African bush trade problem, which I am sure is similar in nature in many other places around the world. But the present crisis warrants our focused attention and energy.

According to the U.S.-based Bushmeat Crisis Task Force, hunters in Central Africa now kill more than a million metric tons of wildlife each year. The total value of the bushmeat trade has reached the staggering level of more than US$50 million annually and potentially could grow to hundreds of millions of dollars in the next two decades. The trade has been called the "most significant threat to wildlife in Africa today."

Among the animals prominently killed for the trade are forest elephants, gorillas, and chimpanzees. Each of these species is endangered and internationally protected, but unless we take steps, these flagships species could disappear forever. In fact, earlier this month poachers killed two adult female mountain gorillas in Rwanda. This is a tragedy for the species that is already on the brink of extinction.

While no one would suggest that people in Africa should be denied the opportunity to feed their families, the international community must encourage the consumption of alternative sources of protein and the creation of other types of income-generating employment. According to Mr. Peter Walsh of the Wildlife Conserva-

tion Society, "We're not talking about starving villagers needing meat. This is heavily organized commercial poaching where money is the motivation." In reality, a great deal of bushmeat is not even eaten by the indigenous population but by consumers who order it from menus at exotic restaurants in Paris, Tokyo, Taipei, and the United States.

Furthermore, we are just beginning to understand the health implications of eating tainted bushmeat. Wildlife, particularly primates, harbor diseases which can jump between species and cause lethal diseases such as AIDS and Ebola.

Our choices are quite simple. We can sit idly by and allow the crisis to exterminate wildlife species throughout Africa, or we can embrace the philosophy of E. O. Wilson who writes that "Every scrap of biological diversity is priceless, to be learned and cherished, and never to be surrendered." I would choose this approach.

We are here this morning to learn from the witnesses, who we can work with to create a strategy so that we will be prepared in this generation to meet the new "Silent Spring" challenge. We will save every scrap of biodiversity that we can. And we will do it in an ever-increasing, wider team effort with the international community.

[The prepared statement of Mr. Gilchrest follows:]

Statement of The Honorable Wayne T. Gilchrest, Chairman, Subcommittee on Fisheries Conservation, Wildlife and Oceans

Good morning, today, the Subcommittee will conduct an unprecedented oversight hearing on the growing crisis of bushmeat consumption on various wildlife species.

According to the U.S. based Bushmeat Crisis Task Force, hunters in Central Africa now kill more than a million metric tons of wildlife each year. The total value of the bushmeat trade has reached the staggering level of more than $50 million U.S. dollars annually. The trade has been called the "most significant threat to wildlife in Africa today".

Among the animals prominently killed for the trade are forest elephants, gorillas and chimpanzees. Each of these species is endangered and internationally protected but unless steps are taken, these flagship species will disappear forever. In fact, earlier this month, poachers killed two adult female mountain gorillas in Rwanda. This is a horrible tragedy for a species that is already on the brink of extinction.

While no one would suggest that people in Africa should be denied the opportunity to feed their families, the international community must encourage the consumption of alternative sources of protein and the creation of other types of income generating employment. According to Mr. Peter Walsh, of the Wildlife Conservation Society, "We're not talking about starving villagers needing meat. This is heavily organized commercial poaching where money is the motivation". In reality, a great deal of bushmeat is not even eaten by the indigenous population but by consumers who order it from menus at exotic restaurants in Paris, Tokyo, Taipei and in the United States.

Furthermore, we are just beginning to understand the health implications of eating tainted bushmeat. Wildlife, particularly primates, harbor diseases which can jump between species and cause lethal diseases such as AIDS and Ebola. Our choices are quite simple. We can sit idly by and allow this crisis to exterminate wildlife species throughout Africa or we can embrace the philosophy of E. O. Wilson who writes that "every scrap of biological diversity is priceless, to be learned and cherished, and never to be surrendered". I choose this approach because each species is vital to the future survival of the ecosystem of the continent.

While I do not have the answer on how to solve the bushmeat crisis, I am confident that our distinguished witnesses will shed some light and will propose some potential solutions to this vexing problem.

I am now pleased to recognize my friend, the distinguished gentleman from Guam, Congressman Robert Underwood.

Mr. GILCHREST. At this point I ask unanimous consent that the gentleman from Guam, Mr. Underwood's statement be put into the record.

[The prepared statement of Mr. Underwood follows:]

Statement of The Honorable Robert A. Underwood, a Delegate in Congress from Guam

Good morning, Mr. Chairman. Thank you for holding this hearing on the bushmeat crisis in Africa. I look forward to hearing from the experts about what the United States and the international community can do to stop the wanton extermination of Africa's wildlife.

At first glance, this problem is simply appalling. Our closest relatives, the Great Apes, with complex human-like social behavior, are on the brink of extinction. Africa's diverse populations of mammals, reptiles, and invertebrates are being decimated. In one example, a single logging camp of 648 people in the Republic of Congo can harvest 8,251 animals annually, or the equivalent of 124 tons of wild meat.

Experts contend that the motivation for the consumption of bushmeat varies from hunger and poverty to cultural traditions to sport. A growing luxury market in urban centers for bushmeat is another ominous threat.

Regrettably, the problem appears intractable. The only way to find solutions is to ask the experts. And perhaps, our only hope to achieve success may be to engage many types of organizations, including commercial entities or industries operating in remote areas, that have access to both financial resources and local people.

I contend that strong leadership by the United States is necessary on this front. As you know, Mr. Chairman, I have been in support of, and worked closely with you to reauthorize, several international conservation laws. I have also supported increased funding for the Multinational Species Conservation Fund.

We have the opportunity today to learn about a topic that could become one of the world's great environmental tragedies. My hope is that we will be spurred on to take more purposeful action.

Thank you, Mr. Chairman, for creating this forum for discussion. I trust that this hearing is only the first of many discussions in this Committee and in the Congress.

Mr. GILCHREST. And since I am alone up here on the dais and the staff probably don't have any opening statements to make in public, we will start the hearing.

Our first witness is Mr. Jeffry Burnam, Deputy Assistant Secretary for the Environment, Bureau of Oceans and International Environment and Scientific Affairs with the Department of State; Dr. Kenneth Stansell, Assistant Director for International Affairs, U.S. Fish and Wildlife Service, Department of Interior; and Mr. James Graham, Project Manager, Central Africa Regional Program for the Environment, USAID Bureau of Africa.

Good morning, gentlemen. Mr. Burnam, you may begin, sir.

STATEMENT OF JEFFRY BURNAM, DEPUTY ASSISTANT SECRETARY FOR ENVIRONMENT, BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE

Mr. BURNAM. Thank you, Mr. Chairman. I appreciate the opportunity to share with you the Department of State's views on the international aspects of the growing problem of bushmeat consumption, which you highlighted in your opening remarks. With your permission, I would like to submit my full statement for the record and only read portions of it.

Mr. GILCHREST. Without objection, so ordered.

Mr. BURNAM. On a recent trip to the Republic of Congo, I saw firsthand the seriousness of the large-scale bushmeat consumption problem. I had the opportunity to visit a pilot project where a for-

estry concessionaire and a local community were working together to help control poaching in a buffer zone around a reserve. I believe that this pilot project suggests that there are many opportunities in Central Africa to work effectively with logging companies to help control activities that have an adverse impact on forests and wildlife.

As you pointed out, the scale of bushmeat consumption is threatening the survival of species such as elephants, gorillas, and chimpanzees in Africa. While bushmeat provides animal protein and a source of income for many families, the bushmeat trade has recently increased dramatically. Concession logging is an important activity in many of these countries. However, it must be properly managed because concession logging results in construction of roads as well as in the migration of populations into previously undisturbed and remote forest areas. In the pilot project I visited in the Republic of Congo, for example, there were only a few hundred villagers in the area prior to the opening of the logging concession, but now there are four or five thousand employees of the logging concession, so you can imagine the impact those additional people have on bushmeat consumption.

The threat to wildlife from the bushmeat trade is also related to political, social, and economic issues. In the Congo Basin, wildlife harvesting is occurring beyond sustainable levels. The illegal trade in wildlife often goes hand in hand with illegal logging and with lack of respect for the rule of law and good governance.

The Department of State has taken a number of steps to address these concerns. The project which I visited in Congo (Brazzaville) is supported by the Department of State, by the International Tropical Timber Organization, and by the United States Agency for International Development through the CARPE program. Nongovernmental and private partners include the Wildlife Conservation Society, the Columbus Zoo, and the logging concessionaire itself. The pilot project employs local people as "eco-guards." It provides income for communities living on the edge of a national park, and it provides a means to enforce the forestry and wildlife laws.

Two aspects of the project I found particularly interesting were the attempts to develop alternative sources of protein for the local residents, and then, second, employees of the logging company, who are, for the most part, the residents of the area, are penalized if they violate the poaching laws. So you can be fined if you are an employee and you violate the laws against hunting, and there have even been some that have been dismissed. So this buffer zone around the national park is actually very helpful in protecting the national park because it provides an effective way of reducing poaching and other threats to wildlife in the area.

In the CITES convention, a Bushmeat Working Group was set up which the Department of State has supported. We have also supported the work of the Bushmeat Crisis Task Force. And our own, my Bureau of OES has worked with the Bushmeat Crisis Task Force in Central Africa, and CARPE, and there is a workshop in Brazzaville at the end of this month and the beginning of next month which should be very promising because it will review the progress of a number of pilot projects in the area and get people together to focus on an awareness of the issues involved.

State considers commercial harvesting of bushmeat a significant biodiversity issue. We are committed to working with partners, both domestically and internationally, to address the problem. In general, I believe there are four areas we can focus on for international collaboration to address this problem, which, as you point out, is badly in need of focused attention.

First would be education about the bushmeat problem, education in the concept of sustainability. The Columbus Zoo was involved in the education aspect of this particular project;

Working through international organizations and agreements;

Encouraging further pilot programs, and I only mention this particular one because I visited it, but there are other programs. The World Wildlife Fund will testify to pilot programs that are similar in nature;

And, of course, educating those consumers in the fancy restaurants about the impacts of their consumption on the bushmeat trade.

Mr. Chairman, effective solutions to the bushmeat problem require a multifaceted approach. We all share the common goal of preserving biological diversity for future generations. Our ability to do so depends upon devising practical measures to move science and policy toward that end.

Thank you very much for the opportunity to testify, and I would, of course, be pleased to answer any questions that you may have.

[The prepared statement of Mr. Burnam follows:]

Statement of Jeffry Burnam, Deputy Assistant Secretary of State for Environment, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State

Thank you for the opportunity to share the Department of State's views on the international aspects of the growing problem of bushmeat consumption.

On a recent trip to the Republic of Congo, I saw firsthand the seriousness of the large-scale bushmeat consumption problem. I had the opportunity to visit a pilot project where a forestry concessionaire and a local community were working together to help control poaching in a buffer zone around a reserve. I believe that this pilot project suggests that there are many opportunities in Central Africa to work effectively with logging companies to help control activities that have an impact on forests and wildlife.

The scale of bushmeat consumption is threatening the survival of species such as elephants, gorillas and chimpanzees in Africa. While bushmeat provides animal protein and a source of income for many families, the bushmeat trade has recently increased dramatically. Concession logging is an important economic activity in many of these countries. However, it must be properly managed because concession logging results in construction of roads and the migration of population into previously undisturbed and remote forest areas. These factors, combined with the development of social and economic networks to support the bushmeat industry and an increasing demand internationally, have transformed bushmeat harvesting from a subsistence activity into a commercial enterprise.

The United States recognizes the cultural and nutritional needs of many communities who use bushmeat for subsistence. Our concern is that the large-scale, unregulated and illegal trade in bushmeat could lead to extinction of many wildlife species and irreversible impacts on African ecosystems.

The threat to wildlife from the bushmeat trade is intimately related to political, social and economic issues. In the Congo Basin, wildlife harvesting is occurring beyond sustainable levels. The illegal trade in wildlife often goes hand in hand with illegal logging and with lack of respect for the rule of law and good governance.

The Department of State has taken a number of steps to address these concerns. The project which I visited in the Republic of Congo is supported by the Department of State, by the International Tropical Timber Organization (ITTO) and by the United States Agency for International Development through its Central African Regional Program for the Environment (CARPE). Nongovernmental (NGO) and private

partners include the Wildlife Conservation Society (WCS), the Columbus Zoo and the logging concessionaire itself, the Consortium Industrielle Des Bois (C.I.B.) This pilot project employs local people as "eco-guards" to protect against commercial-scale bushmeat hunting. It provides income for communities living on the edge of a national park and a means to enforce the forestry and wildlife laws.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) set up a Bushmeat Working Group to promote awareness of the issue of cross-border trade in bushmeat, which the Department of State supported. The United States has also supported the work of a coordinating NGO, the Bushmeat Crisis Task Force, which works with governments and concerned NGOs to address the bushmeat crisis in Africa. I understand that the Bushmeat Crisis Task Force has recently secured several grants from private foundations and from the U.S. Fish and Wildlife Service to assist six Central African governments in addressing the bushmeat crisis.

At the Department of State, our Bureau of Oceans and International Environmental and Scientific Affairs (OES) has supported the Bushmeat Crisis Task Force's work in Central Africa in conjunction with the Central African Regional Program for the Environment (CARPE). We are also helping to sponsor a workshop on wildlife management and conservation in timber concessions in Central Africa in August 2002, focusing in particular on raising the awareness of government policy makers and regulators on the relevance of these issues to sustainable forest management.

The Department of State considers commercial harvesting of bushmeat for widespread consumption a significant biodiversity issue and is committed to working with partners domestically and abroad to address the problems associated with it, including in the context of sustainable development. In general, further international collaboration on this issue could include:

Educating governments, forest concessionaires, and local people about the bushmeat problem and empowering them to understand the concept of sustainability in terms of wildlife harvest.

Working through international agreements such as CITES, CBD and ITTO to further efforts to control the illegal commercial bushmeat trade.

Encouraging governments, forest concessionaires, and local communities to take responsibility and put programs in place for maintaining viable and sustainable wildlife populations.

Educating consumers internationally about the impacts of the bushmeat trade on wildlife populations.

Mr. Chairman, effective solutions to the bushmeat problem require a multifaceted approach that addresses the fundamental social, political and economic causes of the problem. We all share the common goal of preserving biological diversity for future generations. Our ability to do so depends upon devising practical measures to move science and policy towards this end.

Thank you very much. I would be happy to answer any questions that you may have.

Mr. GILCHREST. Thank you, Mr. Burnam.

Dr. Stansell?

STATEMENT OF KENNETH STANSELL, ASSISTANT DIRECTOR FOR INTERNATIONAL AFFAIRS, FISH AND WILDLIFE SERVICE, U.S. DEPARTMENT OF THE INTERIOR

Dr. STANSELL. Good morning, Mr. Chairman. I, too, appreciate the opportunity to appear before you today to present the views of the U.S. Fish and Wildlife Service on the growing crisis of illegal bushmeat consumption in Africa. We have provided our written testimony for the record, so today I would like to make a few brief remarks highlighting the causes, current Service activities, and additional measures that we feel may be needed.

The illegal commercial killing of wildlife, particularly threatened and endangered species, is certainly not unique to Africa. However, it is in Central and West Africa that world attention has been focused on the serious threat to the survival of great apes throughout the region. The lives of humans and wildlife in Africa are inti-

mately entwined. Many rural communities must utilize wildlife resources to satisfy their basic needs. Therefore, it is important to make clear a distinction between the legal harvest of wildlife on a sustainable basis and the unsustainable and illegal commercial exploitation that now exists in many parts of Africa.

The underlying factors driving this exploitation include social and political unrest, lack of adequate protected areas for wildlife, inadequate law enforcement, lack of management capacity in range countries, and a staggering increase in demand.

Roads are built for harvesting timber, penetrating previously inaccessible forests. Poachers have the increasing availability of technology: large-caliber automatic weapons and steel snares. The result is a greatly enhanced ability to kill, process, and transport large quantities of bushmeat to meet an ever-increasing demand.

Dozens of species, both common and endangered, are being exploited at unsustainable rates. Long-lived and slow-reproducing species, such as the great apes and elephants, are among the hardest hit. Chimps and gorillas are particularly prized and often command the highest prices in faraway markets. Through our International Affairs Program, the Service actively participates in a number of activities with a wide range of partners, some that you will hear from today. These include other Federal agencies, governments of other countries, and national and international NGO's. Through our leadership role in the Convention on International Trade in Endangered Species, we have supported efforts to bring this issue to a global forum, resulting in the establishment of a working group that very importantly includes the affected range countries to explore ways to address the illegal trade and bring attention to the conditions that foster it.

Also, through our Multinational Species Conservation Funds particularly for African elephants and great apes, the Service is supporting a number of on-the-ground projects. Our focus is two-pronged: helping to foster local community awareness of the need to manage wildlife sustainably for the long run, and working with our counterpart agencies in range countries, helping to build law enforcement capacity and, where appropriate, to support development of effective systems for legal hunting and trade in the near term.

Through the witnesses today, this Committee will hear a great deal about the crisis and what is being currently done. Regrettably, however, much more remains. We should sustain and enhance these ongoing collaborative efforts. They are making a difference. But we also must address more effectively the underlying causes of this crisis, such as the lack of adequate wildlife monitoring and sustainable management, inadequate systems of protected areas, and, importantly, the need for capacity building.

Range states and local communities must be provided the tools to allow for greater enforcement of existing laws and technical assistance to support wildlife conservation that is sustainable, based both on science and the practical realities.

Mr. Chairman, the Service appreciates your interest in this critical problem, and we look forward to working with you to find solutions to this growing crisis. I, too, would be pleased to respond to any questions that you might have. Thank you.

[The prepared statement of Dr. Stansell follows:]

Statement of Kenneth Stansell, Assistant Director for International Affairs, Fish and Wildlife Service, U.S. Department of the Interior

Good morning, Mr. Chairman and Members of the Subcommittee, I am Kenneth Stansell, Assistant Director for International Affairs for the U.S. Fish and Wildlife Service. I appreciate the opportunity to present testimony for the U.S. Fish and Wildlife Service on the issue of illegal bushmeat consumption in Africa. My testimony will provide the Subcommittee with information regarding the causes of the problems, and the Service's role in wildlife conservation in Africa and how it helps reduce the bushmeat trade. I will also suggest additional measures to address the issue.

Background

Humans and wildlife in Africa share a long and intimately entwined relationship. Many rural communities utilize wildlife resources to satisfy nutritional, economic, and cultural needs. Some communities are almost entirely dependent on wildlife for their subsistence. Meat from domestic species, sometimes imported over long distances, is usually more expensive in remote areas. Livestock husbandry is extremely limited in the forest zone, and even when present, domestic animals are usually utilized as a living bank account (i.e. to be bought and sold) rather than as a sustained source of animal protein through consumption. Urban dwellers are reported to maintain a preference for meat from wild animals over available domestic meat such as beef, fish, and poultry, and indulge this preference if it is affordable. The contrast between the consumption of wildlife in urban centers and in rural areas, and between legal and illegal exploitation of wildlife, require careful qualification in the context of this discussion. The Service would like to make clear the distinction between the legal harvesting of wildlife on a sustainable basis and the unsustainable, illegal trade that exists in many parts of Africa on such an enormous scale.

The conservation community refers to the problem under discussion as at the Illegal Commercial Trade in Bushmeat,@ to distinguish it from legal, small-scale hunting for subsistence and use by local populations in the areas of production. Dozens of species, from rodents to elephants, and including numerous endangered and threatened species, are utilized in the bushmeat trade. [A list of such species is attached.] Legally harvested bushmeat forms a major component of many rural household economies and is a vital source of protein, particularly in rural areas in the forest zone, where alternatives are few or expensive. However, the continued legal utilization of bushmeat by local populations is threatened by illegal commercial-scale exploitation.

Outside traders export large quantities of illegally, and legally, taken bushmeat from areas of production using modern technology such as firearms, wire snares, and transport on motor vehicles. Local hunters are often stuck in a cycle of indebtedness to these traders who, along with market sellers, acquire the major share of profits from the bushmeat trade. It is important to note that some cultures, such as the numerous BaAka Pygmy groups indigenous to the Central Africa region, are at risk of extinction as a result of shifting economies and the advent of the commercial bushmeat trade. The underlying factors driving the bushmeat trade lack of adequate protected areas for wildlife, lack of protein and economic alternatives for rural people, lack of law enforcement capacity in regional governments, and increasing demand for bushmeat must be addressed if the current unsustainable and destructive practices are to be effectively managed. This requires an innovative collaborative effort not only by governments and conservation professionals, but also development experts from throughout the global community.

The bushmeat problem is by no means unique to Africa; it is widespread throughout Asia and Latin America as well. However, it is in Central and West Africa that world attention has been focused on the illegal, commercial killing of wildlife for meat and its impacts on both faunal integrity and ecosystem functions. Due to the low productivity of tropical forest ecosystems, the impacts of poaching over a relatively short period are threatening many species with local extinction and some species, such as the Great Apes, with extinction in much of their range.

An important question to consider is, what has changed in Africa to cause such a steep decline in wildlife populations? People have hunted and eaten wildlife throughout known history, but until recently, large areas still contained significant wildlife populations. However, economic, technological, and social conditions have changed in ways that make a once localized phenomenon widespread across the continent.

Over history, it is likely there were periodic local increases and decreases of hunting pressure and wildlife population levels. Recent decades have seen a dramatic increase in human population growth rates in Africa and a corresponding increase in demand for meat. Wildlife populations may now be unable to reproduce sufficiently to keep up with this growing demand. They are being adversely affected by a combination of over harvest and reduced availability of undisturbed habitat.

The introduction of modern cash economies and transport networks to once isolated, traditional communities puts a monetary value and trade mechanism on what had been only locally consumed and shared. This opportunity for earning income in areas where virtually no alternatives exist provides motivation for hunting that exceeds meeting the basic needs of family or community. Studies have clearly shown that in some places where economies are rapidly developing, there is an increase in available income. A increase in the demand for and the consumption of bushmeat usually follows.

Another economic change in some areas of Central Africa that exacerbates the crisis is the collapse of commodity prices on the world market for crops such as cacao. Previously productive plantations now stand idle and overgrown in many places. Even crops such as oil palm nuts are now produced and shipped more efficiently in West Africa or Asia, thereby rendering these economic alternatives unattractive.

Another cause of the problem is the ease of access to wildlife populations. Historically, access to distant tracts of forest was very difficult, and the ability of poachers to kill, process, and transport large quantities of bushmeat was limited. Today, roads penetrate into previously inaccessible forests. In addition, the technology used to kill wildlife has also changed dramatically in recent times.

Underlying these changes in Africa is the political and social backdrop. Recent decades have seen abrupt and unpredictable, as well as chronic civil conflict. With the breakdown of law and the displacement of large numbers of people, hunting for bushmeat increases dramatically. This is well illustrated in recent years in the Democratic Republic of the Congo, formerly Zaire. National parks and protected areas are settled by refugees and rebel soldiers who turn to wildlife for money and sustenance. Enormous commercial operations in the eastern parts of that country even export bushmeat northward to countries that have already exterminated their wildlife.

The effects of the over harvest of wildlife for the commercial bushmeat market may include species extinction over large areas or entire ecosystems. Some species are more vulnerable than others. Long-lived and slow-reproducing species such as elephants and apes are the hardest hit. Elephants are usually the first species to be taken when a new area is opened to bushmeat hunting. Until recently, elephants were poached primarily for ivory, with their meat being a by-product for local consumption or left in the forest. Now, because of the increased demand for bushmeat, and the ease with which it can be transported and sold often across international borders bushmeat commerce may be a greater threat to the remaining elephant herds than ivory trading.

Gorillas, chimpanzees and bonobos are all illegally hunted for bushmeat, and they are particularly sensitive to disturbance. As species populations come under illegal hunting pressure, they often move into the territory of a neighboring population. This may provoke additional stress, including fighting, among individuals from the two groups. Because of the slow reproductive rate, the loss of even a few percent of a population of these species each year over long periods is sufficient to drive species such as the bonobo to local extinction. Chimpanzee and gorillas are prized by some bushmeat consumers and often fetch the highest price on the market. Some hunters specialize in hunting apes with devastating effects on local populations.

Many more endangered or threatened species are also victims of over-exploitation, including numerous species of monkeys and three species of crocodiles. Thousands of dwarf crocodiles are captured each year in some areas and shipped live to markets in urban centers days or weeks away by riverboat. Our Congolese colleagues inform us that dwarf crocodile numbers are plummeting, and they now are absent from much of their range. This carries serious implications for the aquatic ecosystem.

Role of the Fish and Wildlife Service

The Service is an active participant in a variety of conservation activities with a range of partners in the governments of developing countries and with international and national non-governmental organizations. The Service is responsible for the implementation of the African Elephant Conservation Act of 1989 and the African Elephant Conservation Fund (AfECF) created by the Act, as well as the Great Ape Conservation Act of 2000 and Great Ape Conservation Fund (GACF) created by that Act. With authority under these and two additional Multinational Species Conserva-

tion Acts, the Service is forging effective working relationships with range country governments and non-governmental organizations (NGO) active throughout Africa and Asia. Our Division of International Conservation is also a partner in U.S. Agency for International Development (USAID)'s Central African Regional Program for the Environment (CARPE), a collaboration of US-based NGOs and government agencies working for conservation in the Central Africa forest zone. Our experience in working with partners to conserve and manage wildlife and their habitats in Africa continues to grow. Through our involvement on the ground and in developing networks, the Service has gained some valuable but alarming consciousness about serious wildlife conservation issues.

The African Elephant Conservation Act

Central Africa has been a major focus of technical and financial support through AfECF. One project developed and implemented in cooperation with the World Wildlife Fund and the government of the Central African Republic emphasizes conservation of elephants and their habitats in protected areas such as the Dzanga–Ndoki National Park. During the course of this project, an ecoguard force was trained and equipped, and thousands of wire snares and dozens of illegal firearms have been confiscated. Work with local communities has also led to a better understanding, and increased level of cooperation, among villagers and park personnel. The control of illegal bushmeat trade has been greatly improved through this project.

AfECF funds two important bushmeat control projects in the Republic of Congo, both led by the Wildlife Conservation Society and the Congolese Ministry of Water and Forests. One is a seminal project to regulate bushmeat production and trade in a logging concession south of the Nouabalé–Ndoki National Park in northern Congo. In addition to controlling bushmeat poaching and traffic, the project is making significant progress developing a model for the relationship among a logging company, local communities and hunters, and an international conservation NGO to minimize illegal trade in bushmeat. The model will play an important role in the re-examination of policies and regulations relating to logging concessions to address wildlife management and exploitation concerns.

The other project is in the Lac Tele Community Forest Reserve in the northern Congo. Because there are few roads in this remote area, the river network is used to illegally transport large quantities of bushmeat northward to markets in the Central African Republic. The AfECF grant assists the reserves warden and his team from the Ministry of Water and Forests with controlling key points in the river system that traverses the reserve. In addition, the project has a community awareness component that seeks to inform villagers of the need to conserve wildlife for the long-term, rather than merely as a means for immediate reward.

These three examples of joint projects pursued under AfECF demonstrate that there are ways to help build law enforcement capacity among African government agencies, and to support the development of effective legal hunting and trade regulation systems in the near term.

In the longer term, the training and education provided by these projects will yield sustained benefits to conservation efforts. As the ability of the government to analyze and deal with emerging problems increases, more effective conservation will follow.

The Great Ape Conservation Act

The GACF currently supports 18 projects in 15 countries in Africa. An integral component of some of these projects is conservation education and bushmeat awareness programs. These programs inform local communities that the Great Apes are often targeted as bushmeat species, and are particularly hard-hit by poaching. The Cameroon Wildlife Aid Fund, a national NGO with a conservation education program at the Yaounde Zoo, runs a project that educated an urban audience about the bushmeat trade and its impact on apes and other wildlife. This project is particularly valuable because urban audiences have been largely neglected in most countries in Central Africa.

Another important contribution to public awareness of the crisis is a wide-reaching project in partnership with the Bonobo Conservation Initiative (BCI). BCI a small international NGO that is working with the government of the Democratic Republic of Congo, local NGOs, and communities in the area to the north of Salonga National Park. The Salonga area and its surroundings comprise the entire range of the bonobo. Therefore, protection and management of the area is critical to the survival of the species. This BCI program studies bonobo distribution north of Salonga NP and has a major component to exchange information with communities about the threat posed to bonobos by poaching. The BCI also plans a major radio cam-

paign to raise awareness at a national level and has established an excellent working relationship with Congolese governmental agencies.

The Service's Division of International Conservation is a CARPE partner and is now in its second year of working with many partners from government agencies, NGOs and academia. Our broad range of partners include U.S. Department of Agriculture/Forest Service, Peace Corps, and the National Aeronautic and Space Administration (NASA); World Wildlife Fund, Wildlife Conservation Society, Conservation International, African Wildlife Foundation, World Resources Institute, and Innovative Resources Management; and, the University of Maryland. The focus of the Service's efforts under USAID's CARPE project is to support the Convention on International Trade in Endangered Species (CITES) Bushmeat Working Group (CBWG). The CBWG was formed in response to an adopted proposal at the Eleventh CITES Conference of the Parties, April 2000. The proposal's mandate is to find ways to address the illegal trade in endangered and threatened species (CITES Appendices I and II) across international borders as bushmeat, and the conditions that foster illegal trade in the countries from which the animals originate.

The CBWG is composed of representatives from six Central African countries including the Central African Republic, the Republic of Congo (Brazzaville), the Democratic Republic of the Congo (Kinshasa), Gabon, Cameroon, and Equatorial Guinea. The national representatives are the heads of the respective wildlife divisions, and each country has an appointed national bushmeat officer. A regional coordinator is planned for Yaounde, Cameroon, who will work with the member countries to develop and execute a series of priority actions to address this trade. In addition, the CBWG Regional Coordinator will work closely with the CITES–Monitoring of Illegally Killed Elephants Coordinator for Central Africa to assure a harmonization of effort regarding monitoring of elephant killing and law enforcement patrols.

The Service is working with the governments of these six range countries, the United Kingdom, and international NGOs such as the Bushmeat Crisis Task Force, to support the CBWG and its work. Current efforts include: national wildlife policy reviews; understanding the nature and details of the production sites, transport routes and means, border crossing points, and other information that can be used to control the illegal trade; a study on the status of various regulatory mechanisms within forestry concessions, how they are designed and work, and how they can be improved; and, ways to improve information exchange and the harmonizing of laws among countries in the Central African sub-region. In addition, the CBWG will be responsible for developing and implementing a region-wide awareness campaign regarding the bushmeat trade, which has been identified as a critically important and effective mechanism for effecting beneficial change in behaviors with regard to wildlife use.

Recommendations

The Service recommends the following to address the bushmeat problem: (1) sustaining collaborative efforts such as the Multinational Species Conservation Acts and CARPE Partnership; (2) Central African wildlife policy review and revision, wildlife monitoring and sustainable management, and strengthening the protected areas system in Central Africa; and (3) licensing and regulation of hunting seasons and wildlife trade should be based on science and practicality.

In Central Africa, as elsewhere on the continent, laws exist to regulate hunting and commercial exploitation of wildlife and other forest products. Certain species cannot be hunted, such as the great apes; and some areas are off limits to hunters, such as national parks and other protected areas. In some countries there are closed hunting seasons, and legal methods of hunting and quotas for some species are limited. In most areas, hunters must be licensed and their firearms registered by the authorities. In other places, hunters may only employ traditional means such as crossbows, spears, or nets made of natural fibers. Although the law regulates the commercialization of wildlife, the means to enforce laws and to regulate hunting and trade in wildlife products is very limited. Enforcement of existing laws is needed to regulate hunting and trade so that it is sustainable over the long term.

The CBWG, in cooperation with the CARPE partnership, will conduct policy review and revision in the coming year. Within existing resources, the Service will examine ways to further support this work with technical advice and to assist the range states, when asked, to develop optimal wildlife policies that are harmonized across the sub-region.

In order for wildlife to be sustainably used for food or recreation, monitoring of populations, including threats, health status, off-take, and habitat condition, must be carried out. The Service supports monitoring elephant populations in this area through the CITES Monitoring of the Illegal Killing of Elephants (MIKE) project. As part of this program, information acquisition, transmission, storage, analysis,

and interpretation is being developed. This approach is an efficient way to monitor certain bushmeat species in key areas. Within existing resources, the Service could be of assistance in building these essential capacities among range states and local communities. Linking this effort and the CBWG mandate would enable a harmonization of efforts and efficient use of limited resources and personnel.

Protected areas form the nucleus of wildlife management in Central Africa, and may play a vital role in a source and sink@ model. This model describes a system that allows protected areas to act as a sources@ of wildlife, that when reaching carrying capacity, could move outward into multi-use forests, where they could be sustainable harvested by local people. This model requires sound scientific information, including wildlife monitoring, socioeconomic information about local conditions and attitudes, and the ability to regulate hunting and trade.

In some respects this situation is not unlike that which faced the United States prior to the institution of scientific wildlife management in the 1920s and 1930s. At that time market hunting and loss of habitat had eliminated or nearly eliminated many species here in the United States. Initiatives taken by American hunters and their organizations led to the Migratory Bird Treaty, creation of State fish and wildlife agencies, the Federal Aid in Wildlife Restoration program, and establishment of National Wildlife Refuges and state wildlife management areas to protect habitat.

With the resulting increase in knowledge of how to manage wildlife, dependable funding and continuing strong support from the hunting community, even once severely depleted species of game animals are now plentiful. Few Americans, even hunters, know that there were fewer than 500,000 white-tailed deer in the entire United States in the 1920s, and that most States east of the Mississippi had no or very limited deer seasons. At that time, hunting of wood ducks was banned, and it was feared they would go extinct. They are now the most common breeding waterfowl in the East.

While the American conservation experience cannot be transplanted wholesale to Africa, we have acquired a tremendous body of knowledge relating both to wildlife management and to fostering a conservation ethic among the hunting community which can serve as models to be adapted to local conditions elsewhere. Equally important, we know from our own experience that these measures can work.

Finally, although anecdotal evidence identifies there is an existing problem concerning importation of bushmeat into the United States, there has yet to be a definitive review of the extent of the problem. It is important to work with partners internationally to identify how bushmeat is entering the United States and to develop training programs for customs agents in the countries of origin to control the export of bushmeat from the source.

Mr. Chairman, the Service appreciates your interest in the critical problem of illegal bushmeat consumption and trade. We look forward to working with you and members of the Committee to seek ways to address this crisis. This concludes my testimony. I will be pleased to respond to any questions you may have.

[Attachments to Mr. Stansell's statement follow:]

Source: Stein, J.T. and BCTF. 2001. Species Affected by the Bushmeat Trade. Bushmeat Crisis Task Force. Silver Spring, Maryland. Available from: [http://www.bushmeat.org/html/SpeciesAffected.htm].

Species Affected by the Bushmeat Trade in Africa†*

Last updated 04 December 2001 by Julie Stein, BCTF Scientific Coordinator

†Source for species in BOLD: CITES DOC 11.44

CE=Critically Endangered, EN=Endangered, DD=Data Deficient, LR=Lower Risk, , VU=Vulnerable, NR=Not Ranked, cd= conservation dependent, lc= least concern, nt= near threatened

FAMILY/*Order*/Common Name	**Scientific name**	**IUCN Red List Status**	**CITES Status**
ARTIODACTYLA			
Bovidae			
African buffalo (E&S)‡	*Syncerus caffer*	LR-cd	Not listed
Bohor reedbuck (E&S)	*Redunca redunca*	LR-cd	Not listed
Bongo antelope (W&C)‡	*Boocercus euryceros*	LR-nt	Appendix III
Bushbuck	*Tragelaphus scriptus*	NR	Not listed
Cape grysbok (S)	*Raphicerus melanotis*	LR-cd	Not listed
Common eland (E&S)	*Tragelaphus (Taurotragus) oryx*	LR-cd	Not listed
Dik-dik (E&S)	*Madoqua spp.*	NR	Not listed
Duiker**	*Cephalophus spp.*	See notes below	See notes below
Forest buffalo (W&C)	*Syncerus caffer nanus*	LR-cd	Not listed
Gemsbok or oryx (E&S)	*Oryx gazella*	LR-cd	Not listed
Grant's gazelle (E&S)	*Gazella granti*	LR-cd	Not listed
Greater kudu (E&S)	*Tragelaphus strepsiceros*	LR-cd	Not listed
Hartebeest (E&S)	*Alcelaphus buselaphus*	LR-cd	Not listed
Impala (E&S)	*Aepyceros melampus*	LR-cd	Not listed
Klipspringer (E&S)	*Oreotragus oreotragus*	LR-cd	Not listed
Lesser kudu (E&S)	*Tragelaphus imberbus*	LR-cd	Not listed
Nyala (E&S)	*Tragelaphus angasii*	LR-cd	Not listed
Oribi (E&S)	*Ourebia ourebi*	LR-cd	Not listed
Puku (E&S)	*Kobus vardoni*	LR-cd	Not listed
Sable antelope (E&S)	*Hippotragus niger*	LR-cd	Not listed
Sharpe's Grysbok	*Raphcierus melanotis*	LR-cd	Not listed
Sitatunga (W&C)	*Tragelaphus spekei*	LR-nt	Appendix III
Southern or common reedbuck (E&S)	*Redunca arundinum*	LR-cd	Not listed
Springbok (E&S)	*Antidorcas marsupialis*	LR-cd	Not listed
Steenbok (E&S)	*Raphicerus campestris*	NR	Not listed
Suni (E&S)	*Neotragus moschatus*	LR-cd	Not listed
Thomson's gazelle (E&S)	*Gazella thomsonii*	LR-cd	Not listed
Waterbuck (E&S)	*Kobus ellipsiprymnus*	LR-cd	Not listed
Topi (E&S)	*Damaliscus lunatus*	LR-cd	Appendix III
Wildebeest (E&S)	*Connochaetes taurinus*	LR-cd	Not listed
Hippopotamidae			

Hippopotamus (E&S)	*Hippopotamus amphibius*	NR	Appendix II
Giraffidae			
Giraffe (E&S)	*Giraffa camelopardalis*	LR-cd	Not listed
Suidae			
Bush pig	*Potamochoerus porcus*	NR	Not listed
Giant forest hog (W&C)	*Hylochoerus meinertzhageni*	NR	Not listed
Warthog (E&S)	*Phacochoerus aethiopicus*	NR	Not listed
Tragulidae			
Water chevrotain	*Hyemoschus aquaticus*	DD	Appendix III
CARNIVORA			
Canidae			
Bat eared fox (E&S)	*Otocyon megalotis*	NR	Not listed
Black backed jackal (E&S)	*Canis mesomelas*	NR	Not listed
Felidae			
Golden cat (W&C)	*Felis aurata*	NR	Appendix II
Leopard (W&C)	*Panthera pardus*	NR	Appendix I
Mellivorinae			
Honey badger or ratel (E&S)	*Mellivora capensis*	NR	Appendix III
Mustelidae			
Congo Clawless Otter	*Aonyx congica*	DD (1999)	Appendix I
Spot-necked otter (W&C)	*Lutra maculicollis*	VU	Appendix II
Viverridae			
African civet	*Civectictis civetta*	NR	Appendix III
Aquatic genet	*Osbornictis piscivora*	DD	Not listed
Crested genet	*Genetta cristata*	EN	Not listed
Johnston's genet	*Genetta johnstoni*	DD	Not listed
Leighton's linsang	*Poiana richardsonii liberiensis*	DD	Not listed
Liberian mongoose	*Liberiictis kuhni*	EN	Not listed
Mongoose	*Crossarchus & Herpestes spp.*	NR	Not listed
Small spotted genet (W&C)	*Genetta servalina*	NR	Not listed
Two spotted palm civet (W&C)	*Nandinia binotata*	NR	Not listed
CORACIIFORMES			
Bucerotidae			
Black-casqued hornbill (W&C)	*Ceratogymna atrata*	NR	Not listed
Black and white casqued hornbill (W&C)	*Bycanistes subclindricus*	NR	Not listed
CUCULIFORMES			
Musophagidae			
Blue plantain-eater (W&C)	*Corythaeola cristata*	NR	Appendix III
FALCONIFORMES			
Accipitridae			
Crowned hawk-eagle (W&C)	*Stephanaoetus coronatus*	NR	Appendix II
GALLIFORMES			

Phasianidae			
Helmeted guinea fowl	*Numida meleagris*	NR	Not listed
HYRACOIDAE			
Procaviidae			
Tree hyrax (W&C)	*Dendrohyrax dorsalis*	NR	Not listed
LAGOMORPHA			
Leporidae			
Scrub hare	*Lepus saxatilis*	NR	Not listed
PERISSODACTYLA			
Equidae			
Zebra (E&S)	*Equus burchelli*	spp. chapmani & crawshayi-DD	Not listed
PHOLIDOTA			
Manidae			
common/tree pangolin (W&C)	*Manis tricuspis Rafinesque*	NR	Appendix II
giant pangolin (W&C)	*Manis gigantea Illiger*	NR	Appendix II
PRIMATES			
Cercopithecidae			
Collared mangabey (W&C)	*Cercocebus torquatus*	LR-nt	Appendix II
Crested mangabey (W&C)	*Cercocebus galeritis*	LR-nt	Appendix II
Drill (W&C)	*Mandrillus leucophaeus*	EN	Appendix I
Greater white nosed monkey (W&C)	*Cercopithecus nictitans*	NR	Appendix II
Gray-cheeked mangabey (W&C)	*Cercocebus albigena*	NR	Appendix II
Cercopithecinae			
Baboon	*Papio cynocephalus*	LR	App. II where listed
crowned guenon (W&C)	*Cercopithecus pogonias*	EN	Appendix I
De Brazza's monkey	*Cercopithecus neglectus*	NR	Appendix II
Diana monkey (W&C)	*Cercopithecus diana*	EN	Not listed
Mandrill (W&C)	*Mandrillus leucophaeus*	VU	Appendix I
Mona monkey (W&C)	*Cercopithicus mona*	NR	Appendix II
Moustached monkey (W&C)	*Cercopithecus cephus*	NR	Appendix II
Owl-faced monkey (W&C)	*Cercopithecus hamlyni*	LR-nt	Appendix II
Preuss's monkey (W&C)	*Cercopithecus preussi*	EN	Appendix II
Red-eared monkey/russet-eared guenon (W&C)	*Cercopithecus erythrotis*	VU	Appendix II
Samango monkey (E&S)	*Cercopithecus mitis*	NR	Appendix II
Sclater's monkey (W&C)	*Cercopithecus sciateri*	NR	Not listed
Sun-tailed monkey (W&C)	*Cercopithecus solatus*	VU	Appendix II
Talapoin (W&C)	*Miopithecus talapoin*	NR	Appendix II
White-nosed monkey (W&C)	*Cercopithecus nictitans*	LR-lc	Appendix II
White-throated monkey (W&C)	*Cercopithecus erythrogaster*	EN	Appendix II
Colobidae			
Black colobus (W&C)	*Colobus satanas*	VU	Appendix II

Eastern black & white colobus (W&C)	*Colobus guereza*	NR	Appendix II
Geoffrey's pied colobus (W&C)	*Colobus vellerosus*	VU	Appendix II
Red colobus (W&C)	*Colobus badius pennanti*	EN	Appendix II
Loridae			
Potto (W&C)	*Perodictus potto*	NR	Appendix II
Pongidae			
Bonobo (W&C)	*Pan paniscus*	EN	Appendix I
Chimpanzee	*Pan troglodytes*	EN	Appendix I
Cross River gorilla (W&C)	*gorilla gorilla ssp. Diehli*	CE	Appendix I
Grauer's or eastern lowland gorilla (W&C)	*Gorilla beringei graueri*	EN	App. I
Mountain gorilla	*gorilla beringei beringei*	CE	App. I
Western lowland gorilla (W&C)	*gorilla gorilla gorilla*	EN	App. I
PROBOSCIDEA			
Elephantidae			
African elephant	*Loxodonta Africana*	EN	App. I or II
RODENTIA			
Hystricidae			
Brush-tailed porcupine	*Artherurus africanus*	NR	Not listed
Muridae			
Giant rat (W&C)	*Cricetomys emini*	NR	Not listed
Pedetidae			
Springhare (E&S)	*Pedetes capensis*	VU	Not listed
Sciuridae			
Ruwenzori sun squirrel (W&C)	*Helioschiurus ruwenzorii*	LR-lc	Not listed
Thryonomyidae			
Greater cane rat (grasscutter)	*Thrionomys swinderianus*	NR	Not listed
STRUTHIONEFORMES			
Struthionidae			
Ostrich (E&S)	*Struthio camelus*	NR	Not listed
SQUAMATA			
Boidae			
Rock python (W&C)	*Python sehae*	NR	Appendix II
Varanidae			
Monitor lizard (W&C)	*Varanus spp.*	NR	Appendix II
TESTUDINES			
Testudinidae			
Forest tortoise (W&C)	*Kynixis erosa Schweigger*	DD	Appendix II

‡‡Note: "(W&C)" refers to species affected by the bushmeat trade in West and Central Africa (Côte d'Ivoire, Ghana, Nigeria, Sierra Leone, CAR, Congo, DRC, Equatorial Guinea, Gabon, Rwanda), "(E&S)" refers to species affected by the bushmeat trade in East and Southern Africa (Kenya, Tanzania, Malawi, Zambia, Zimbabwe, Mozambique, Botswana, Uganda), absence of either notation indicates pan African distribution.

From: Stein, J.T. and BCTF. 2001. Species Affected by the Bushmeat Trade. Bushmeat Crisis Task Force. Silver Spring, Maryland.

BCTF welcomes your questions and comments on this draft document: info@bushmeat.org

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****Additional Information on status and range of duikers**

Adapted from: Eves, H. E. 2000. Duikers: A Primary Target for Africa's Bushmeat Trade. Animal Keepers' Forum 27(11): 479-505.

Common Name	*Scientific Name*	*Countries of Origin*	*IUCN Red List Status*	*CITES Status*
Bay duiker	*Cephalophus dorsalis*	Guinea-Bissau to DRC, N. Angola	LR-nt	App. II
Black duiker	*C. niger*	Guinea to SW Nigeria	LR-nt	Not listed

Black-fronted duiker	*C. nigrifrons*	S. Cameroon to W. Kenya & N. Angola	LR-nt	Not listed
Blue duiker	*C. monticola*	SE Nigeria to Kenya to South Africa	Lr-lc	App. II
Common or gray duiker	*Sylvicapra grimmia*	across Sub-Saharan Africa	NR	Not listed
Harvey's red duiker	*Cephalophus harveyi*	discontinuously from S. Somalia, E. Kenya, E. & S. Tanzania	LR-cd	Not listed
Jentink's duiker	*C. jentinki*	Liberia, Cote d'Ivoire, Sierra Leone	VU	App. I
Ogilby's duiker	*C. ogilbyi*	Sierra Leone to Gabon, Bioko Island	LR-nt	App. II
Peter's duiker	*C. callipygus*	Cameroon, Gabon, Congo	LR-nt	Not listed
White-bellied duiker	*C. leucogaster*	S. Cameroon to DRC	LR-nt	Not listed
Yellow-backed duiker	*C. sylvicultor*	Gambia to Kenya, N. Angola & Zambia	LR-nt	App. II
Zebra duiker	*C. zebra*	W. Sierra Leone to C. Côte d'Ivoire	VU	App. II

Mr. GILCHREST. Thank you very much, Dr. Stansell.

Mr. Graham?

STATEMENT OF JAMES A. GRAHAM, PROJECT MANAGER, CENTRAL AFRICA REGIONAL PROGRAM FOR THE ENVIRONMENT, U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. GRAHAM. Good morning, Mr. Chairman. I would like to thank you for inviting me to testify. If I could, I would like to have my written testimony submitted for the record and instead provide a brief summary of my statement.

Mr. GILCHREST. Without objection.

Mr. GRAHAM. Thank you.

As the project manager for USAID's Central Africa Regional Program for the Environment, I am quite familiar with the problem of commercial-scale bushmeat hunting in Sub-Saharan Africa. Among the rural population in the Congo River Basin, until recently, people made money growing and selling rice, cotton, cacao, coffee, and peanuts. With farming unprofitable and off-farm jobs difficult to come by, many rural people with access to the forest have resorted to commercial hunting and trading of bushmeat. The move toward bushmeat has occurred because high returns can be realized from a relatively small investment. Wildlife is a free good which is harvested when other alternatives to earn money are limited. Bushmeat is relatively inexpensive because hunters do not pay costs of producing wildlife, as do farmers who raise livestock.

Moreover, logging companies have opened up once-isolated forests, providing hunters with easy access to abundant wildlife and traders with cheap transportation, which in turn reduces bushmeat production costs and increases supply to urban markets. Rampant availability of firearms as a spinoff from political insecurity in the region has made harvesting bushmeat easy.

Though habitat loss is often cited as the primary cause of wildlife extinction, over the next 5 to 10 years commercial bushmeat hunting will constitute the most immediate threat to wildlife conservation in Central Africa. At current levels of exploitation, this will result in the progressive depletion and local extinction of most species of apes and other primates, large antelope, and elephant from hunted forests.

Moreover, hunting indirectly impacts the forest by: first, threatening the survival of forest carnivores that rely on bushmeat species as prey; and, two, significantly reducing the number of seed-dispersing animals, thus changing tree species regeneration rates and forest structure and composition. The direct and indirect impacts of this unsustainable hunting will have both immediate and long-term adverse impacts on the structure and function of the forest.

For example, while rates of deforestation in the region are currently low, it is estimated by CARPE that forest cover may decline by between 29 and 46 percent by the year 2050. The transmission of disease from animals to humans is also well documented. Bushmeat consumption may place people in increased jeopardy of contracting and transmitting animal-derived diseases or other emerging pathogens.

USAID's CARPE program has supported preliminary initiatives in several areas to blunt the trend toward increased bushmeat consumption. CARPE partners, among whom you will hear from WWF, WCS, CI, and the Fish and Wildlife Service already, have recently worked to help CARPE in creating CITES, the Convention on International Trade in Endangered Species, Bushmeat Working Group, which attempts to exchange information on bushmeat activities among the Congo Basin states.

USAID is also directly supporting gorilla conservation activities that include several efforts to ensure that primates are not hunted for bushmeat in locations in Central Africa. In addition, USAID conducts a number of health and nutrition programs in the Congo River Basin that have the effect of combating the spread of diseases stemming from practices such as the consumption of bushmeat.

In conclusion, I would note that the bushmeat crisis is only a symptom of a much greater problem of the lack of sustained development in the Congo Basin. The solution to the bushmeat crisis will only be achieved by fully involving Africans in undertaking essential broad development actions, thus raising their overall standard of living to allow them to secure the alternative sources of protein.

Thank you, Mr. Chairman. I would be happy to answer any questions.

[The prepared statement of Mr. Graham follows:]

Statement of James A. Graham, Project Manager, Central Africa Regional Program for the Environment, U.S. Agency for International Development

Mr. Chairman and distinguished members of the Committee, I would like to thank you for inviting me to testify about the environmental problems confronting the Congo River Basin in light of the growing trend of bushmeat consumption in the region. As the project manager for the U.S. Agency for International Development's (USAID) Central Africa Regional Program for the Environment (CARPE), I am quite familiar with the problem of bushmeat consumption in sub–Saharan Africa.

While wildlife has been hunted for food throughout the history of human existence, only in the last several years has bushmeat become commercialized [What does this mean, "become monetized"? Can we say this more clearly?], and consequently, an important source of income in Central Africa. Among the rural population in this region, until recently, people made money growing and selling rice, cotton, cacao, coffee, and peanuts. Over the past 20 years, however, livelihoods have suffered as commodity prices have plummeted and increasingly poor road systems

have made it more difficult and costly to transport goods to market. With farming unprofitable and off-farm jobs difficult to come by, many rural people with access to the forest have resorted to the commercial hunting and trading of bushmeat.

The move toward bushmeat has occurred because high returns can be realized from a relatively small investment. Firearms, which have become abundant as a result of assorted civil conflicts, and other items, such as snares, are readily available for use in the hunting of game for bushmeat. Furthermore, wildlife is a free good. Increasing urban populations have fueled the demand for bushmeat and while these populations have grown, their buying power has declined with the weakening regional economy. Families that were once able to afford beef, chicken, and pork now have shifted to typically less expensive wildlife as their primary source of protein. Bushmeat is relatively inexpensive because hunters do not pay the costs of producing wildlife, as do farmers who raise livestock. Moreover, logging companies have opened up once-isolated forests, providing hunters with easy access to abundant wildlife and traders with cheap transportation, which in turn reduces bushmeat production costs and increases supply to urban markets.

Though habitat loss is often cited as the primary cause of wildlife extinction, over the next 5 10 years, commercial bushmeat hunting constitutes the most immediate threat to wildlife conservation in Central Africa. The scale of commercial hunting required to supply large, rapidly growing urban populations with meat is now exceeding levels that can be tolerated by most large-bodied, slow-reproducing forest animals. At current levels of exploitation, this will result in the progressive depletion and local extinction of most species of apes and other primates, large antelope, and elephant from hunted forests. Only small, rapidly reproducing animals such as rodents and the smallest of antelope are likely to survive the pressure from commercial hunters.

Moreover, hunting indirectly impacts the forest by (1) threatening the survival of forest carnivores such as leopards, golden cats, crowned eagles, and snakes that rely on bushmeat species as prey; and (2) significantly reducing the number of seed dispersing animals, thus changing tree species regeneration rates and forest structure and composition. The direct and indirect impacts of this unsustainable hunting will likely have both immediate and long-term adverse impacts on the structure and function of the forest. For example, while the rates of deforestation in the region are currently low, it is estimated by CARPE that forest cover may decline by between twenty-nine and forty six percent by 2050. In addition, bushmeat consumption may place people in increased jeopardy of contracting and transmitting animal-derived (epizootic) diseases or other emerging pathogens. For instance, by eating a partially cooked chimpanzee a bushmeat consumer could contract a fatal disease such as Ebola. This transmission of disease from animals to humans is well documented, with brucellosis and toxoplasmosis serving as two additional examples.

Today, bushmeat continues to be an economically important food and trade item for as many as 30 million poor rural and urban people in the Congo Basin. In Central Africa, over 1 million metric tons of bushmeat are consumed each year the equivalent of almost 4 million cattle. A hunter can make the equivalent of $300 $1,000 per year more than the average household income for the region. This income figure is also comparable to the salaries paid to park officials, leaving them susceptible to graft. Traders, transporters, market sellers and restaurateurs also benefit from the commercial trade in bushmeat, and in combating this problem, the USG must acknowledge that all of these incomes would decline if laws against the trade were strictly enforced. As demand for bushmeat increases, more people will be encouraged to become involved in the trade, increasing the pressure on wildlife populations, threatening the survival of rare species, and jeopardizing access of future families to the nutritional and income benefits from non-endangered wildlife.

Rising demand for bushmeat, lack of income-generating options for rural and urban communities, the absence of affordable and acceptable substitutes, the opening up of "frontier" forests by logging and mining companies, the complicity of government lawmakers and law enforcers, and the fact that almost anyone can go hunting anywhere without restriction are the most important factors driving commercial hunting and working against wildlife conservation. On top of all of this there is an emerging link between what is becoming known as "illegal logging" and the bushmeat trade. While "illegality" is at times a somewhat murky concept in the Congo Basin—in that the enforcement of many laws often serves more as an inducement to pay bribes than to benefit the state—much logging is done outside strict application of the laws. Bushmeat (including the meat of endangered species) is gathered as "value added" to logging activity. Increased attention devoted to "illegal logging" may in time, however, have a dampening effect on the worst excesses of the bushmeat trade.

International awareness and support for control of the bushmeat trade was virtually non-existent until the late 1990s, and it is urgent that concerned individuals and conservation groups work with an expanded group of government personnel and other key decision makers to convince them of the significance of the bushmeat crisis. They also must cultivate the political will to ensure that adequate financial resources and professional capacity are provided to address the problem. Nongovernmental organizations (NGOs), governments, and industry are awakening to the challenge, and are currently seeking ways to address the bushmeat crisis at the local, national, and international level. Their pilot initiatives include working with logging companies to reduce or halt the flow of bushmeat from concessions and to minimize employee reliance on bushmeat as a source of food and supplementary income; convincing donors to increase their long-term support for protected area management; piloting projects to provide consumers with affordable and palatable alternatives to bushmeat; encouraging governments to develop legislation and law enforcement capacity appropriate to the local context; and facilitating collaboration among the numerous organizations and agencies working in the region.

USAID's CARPE program has supported preliminary initiatives in several of these areas. CARPE partners have recently worked to create the Convention on International Trade in Endangered Species (CITES) Bushmeat Working Group (CBWG), which attempts to exchange information on bushmeat activities among the Congo Basin states. The CBWG is composed of representatives from a half dozen Central African countries. The national representatives are the heads of the respective wildlife divisions of the individual countries and each nation has appointed a national bushmeat officer. The organization plans to set up a regional coordinator in Cameroon who will work with the member countries to develop and execute a series of actions to limit the bushmeat trade. Current efforts include: national wildlife policy reviews; improving local understanding of the details of production sites, transport routes, and border crossing points; a study of the status of various regulatory mechanisms within forestry concessions; and ways to improve information exchange and the harmonization of laws among the countries. The CBWG will also be responsible for developing and implementing a region-wide awareness campaign regarding the bushmeat trade. USAID is also directly supporting gorilla conservation activities that include efforts to ensure that these primates are not hunted for bushmeat in three locations in Central Africa. We are doing this by providing our U.S. private voluntary organization partners with $1.5 million in each of the two past fiscal years.

USAID also conducts a number of health and nutrition programs in the Congo River Basin that have the effect of combating the spread of diseases stemming from practices such as the consumption of bushmeat. As I mentioned earlier in my testimony, wildlife, particularly wild primates, harbor viruses that can be transmitted between species. For example, outbreaks of diarrhea have been associated with the consumption of bushmeat. USAID supports a wide range of health and nutrition programs in the Congo River Basin aimed at reducing the morbidity and mortality of infectious diseases. These programs include diarrheal disease control, prevention of tuberculosis, polio eradication and routine immunization, integrated disease surveillance and epidemic preparedness and response.

In conclusion, I would note that the bushmeat crisis is only a symptom of the much greater problem of the lack of sustained development in the Congo Basin. With burgeoning populations, deteriorating terms of trade for most primary products, insecurity, and dilapidated infrastructure, much of the Congo Basin has a lower standard of living than at independence more than 40 years ago. The "solution" to the bushmeat crisis will only be achieved by fully involving Africans in undertaking essential broad development actions, thus raising their overall standard of living to allow them to secure the alternative sources of protein.

Thank you. I would happy to answer your questions.

Mr. GILCHREST. Thank you, Mr. Graham.

A couple of months ago, I was in Africa and we went to visit it, some for a couple of days, some for just a few hours, I believe close to 13 countries. And the statement by a petite German nun in an AIDS clinic in Ethiopia, Addis Ababa, she was a dentist in Germany and gave that up to find a much more satisfying way to find meaning in life, so she went to an AIDS clinic for children in Ethiopia. She said "Africa goes through three cycles, and three cycles

only: drought, war, and disease. And each one of those has their own devastating ramifications and causes."

So we are engaged in a very, very difficult enterprise that, unless we get the cooperation from vast numbers of people, including governments and nonprofits and the people who are looking to find some type of work, some type of food, some type of dignity, and those that invest in opportunities in Africa, which would be the miners, the loggers, essentially foreign governments, I guess we are going to have a tough road to hoe—not impossible but we just want to be as important a part of that strategy as humanly possible.

Mr. Burnam, can you tell us about how many pilot projects there are in this arena dealing with the bushmeat problem?

Mr. BURNAM. No, I don't have an exact number. I think the witness from the World Wildlife Fund might be able to fill you in on their activities. This particular project has been going on for about 3 years, and it is sort of widely regarded as a potential model for the region. I know across the border in Cameroon and the Central African Republic, there are also eco-guards and there is cooperation between the eco-guards in this trinational area. But my impression is the pilot projects are just sort of getting off the ground.

Mr. GILCHREST. So this particular pilot project that you went to—

Mr. BURNAM. Yes.

Mr. GILCHREST. —there are eco-guards there as well?

Mr. BURNAM. There are 39 eco-guards.

Mr. GILCHREST. How are they paid?

Mr. BURNAM. They are paid partly by the logging concession and also by the NGO's who are funded also by CARPE.

Mr. GILCHREST. What is the logging concession? Is that locally owned? Is that foreign owned?

Mr. BURNAM. No, it is actually a Swiss holding company. It is one of the major logging companies in the area. Most of the logging companies are—

Mr. GILCHREST. When you say one of the largest logging companies in the area, does that go beyond the Congo?

Mr. BURNAM. I'm not sure exactly what their holdings are. There are a number of major French and European logging companies that work—

Mr. GILCHREST. But they are fairly substantial?

Mr. BURNAM. Oh, yes. There are also sort of fly by-night logging companies.

Mr. GILCHREST. They are the fly by-night logging company?

Mr. BURNAM. There are some, yes.

Mr. GILCHREST. Oh, there are some.

Mr. BURNAM. Yes. One of the problems is if a responsible company increases costs by 3 or 4 percent, can they compete with the fly by-night ones? And that is a problem. But I do think that having the concession there with the eco-guards and the controls they place on the wildlife harvesting is very important. It is encouraging, and I think more projects like this need to be started up.

Mr. GILCHREST. What are the other sources of protein? I guess if the eco-guards are fairly well paid and there is a bit of an infrastructure there for employment for the loggers, but we don't want people to eat the bushmeat, and agriculture is not working very

well or has disappeared, do they have a plan right now for sources of food for the people in this region?

Mr. BURNAM. Well, the plan really ensures that the local residents have adequate supplies of bushmeat. I mean, you don't need to cut them off entirely. There are hunting laws. They hunt in certain zones in certain seasons, just the way you would in the U.S.

Mr. GILCHREST. Who enforces that?

Mr. BURNAM. The eco-guards and the logging company. And some of them—some of the people turn in their firearms outside hunting season so they won't be caught, they won't be tempted. So it is really—there are a lot of controls. The alternative sources of protein, vegetable gardens, they are trying to work, as you would know, more effectively on the poultry farms, which are a problem in Africa because of viruses, but they are trying to work on poultry farms. They are bringing in beef in small quantities. I was told anecdotally that the price of bushmeat on the market has doubled, which is a sign that, you know, the controls of bushmeat can raise the price. A lot of it is price. The bushmeat, as Mr. Graham pointed out, is pretty cheap. It is pretty cheap to harvest, and it is pretty cheap on the market. And so if you have got the price of chicken and the price of beef—they even have a snail project going on. You get those things to—

Mr. GILCHREST. Peanuts, do peanuts grow there?

Mr. BURNAM. Pardon me?

Mr. GILCHREST. Peanuts?

Mr. BURNAM. Peanuts, I don't know.

Mr. GILCHREST. That wouldn't work there.

Mr. BURNAM. I am not sure. But they—a lot of it is price and education, and the people of the area, they love the wildlife. They really don't want to see—they don't want to lose their wildlife. So there is a lot of support for the program from the people in the area, once they are educated as to the nature of the problem. So I think it is a very promising concept.

Mr. GILCHREST. Mr. Graham, are you familiar with the pilot project that Mr. Burnam is talking about?

Mr. GRAHAM. Yes, I am familiar with it because it is with one of our CARPE partners that it is being implemented.

Mr. GILCHREST. Who is the partner?

Mr. GRAHAM. I believe it is WCS in this particular area, if it is the same project. This is a project that has basically brought—it was a very innovative project on the part of WCS, Wildlife Conservation Society of New York, bringing together what I would like to characterize as a reformed lumber baron who had his difficulties in court, et cetera, in Europe and has basically come around a long way to being antagonistic to national parks and to game preservation to now being very cooperative. And I think the WCS deserves—

Mr. GILCHREST. How did that happen?

Mr. GRAHAM. I think WCS deserves high credit for inducing him to be a cooperator.

Also, the Government of Congo has cooperated a great deal with the evolution of this project, as has a small eco-tourism organization called Safari International. The four of them got together and have basically created a large area in North Congo which can serve

the multiple requirements that are necessary for the game to continue to exist. It is, as Mr. Burnam has pointed out, it is possible to continue to harvest a very moderate amount of bushmeat for the local needs. The biggest issue is what happens when that bushmeat starts to go into the urban areas where the demand is high, the price is high, and the production just skyrockets.

Mr. GILCHREST. When you say bushmeat—I understand that we still hunt deer here. They trap fox, possum, et cetera, all over the country. And it makes sense to allow local people to continue to harvest moderate amounts of bushmeat for consumption. Would you include gorillas in that bushmeat?

Mr. GRAHAM. No, sir. I believe that in most—the range of the various different kinds of gorillas, the four major divisions within the gorilla community, there is only one where it isn't severely endangered, and that is in the area of western lowland. But even in that area, it is by no means a situation where it would be the kind of thing that you could go out and have your—like a deer hunt. There should not be an open season on gorillas under any circumstances.

Mr. GILCHREST. In reading and preparing for the hearing today, it seemed that there was at least somewhere some evidence—and I mentioned it in the opening statement—about restaurants in various parts of the country that serve exotic meals and in some cases maybe even gorilla meat.

What is done in those countries—Europe, Japan, or the United States—as far as enforcement is concerned in dealing with these international agreements to not deal in endangered species? Are you aware of any restaurant—or any effort to pursue the restaurants?

Mr. GRAHAM. No, sir, I am not aware of any; in this country I am not familiar. I have seen menus in Africa that include a number of animals that I don't choose to eat and I am not sure I would want to digest. But the issue that you bring up I would defer to Dr. Stansell because it really falls under the CITES; transportation of gorillas in any way, whether they are dead, in a diplomatic bag or whatever, is strictly against CITES. And I would defer—

Mr. GILCHREST. Dr. Stansell, can you tell us what the Fish and Wildlife Service is doing in that area?

Dr. STANSELL. Yes, Mr. Chairman, thank you. As I said in my testimony, there are literally dozens of species that are utilized for bushmeat. Some of those are fairly common throughout the continent. Some of those are very rare and very limited. Through the Convention on International Trade in Endangered Species, we have identified those species that are particularly threatened or endangered as a result of international trade, which include species like gorillas, elephants, and some of the crocodile species. There is a complete commercial ban on the trade in their meat for any reason. And the U.S. Fish and Wildlife Service aggressively enforces those kinds of imports into the United States.

I would say the Convention, however, is made up of 158 parties now, and the strength of that Convention is based on the ability of those individual parties to do the enforcement. You could very well see species that are technically listed on the Convention appear in a situation like in a restaurant, but hopefully not here in

the United States. In fact, we have made a few cases in the United States on certain species that were illegally imported. So I think it is a problem and it is outside the United States. I think there are—

Mr. GILCHREST. Has there ever been a restaurant cited or fined or closed down because they have served gorilla meat or some other type of endangered species?

Dr. STANSELL. Not in the United States, and I don't know about other countries and their enforcement. We have much stricter domestic measures under the Endangered Species Act that also cover a number of these species.

Mr. GILCHREST. Is there any way to know whether the trade in bushmeat, especially to restaurants in foreign countries, is widespread, is a small part of the bushmeat trade problem?

Dr. STANSELL. I believe that it is a growing part of the bushmeat problem, even if it affects species that are fairly common and not gorillas. It feeds the demand and the desire for others to have access to those kinds of species. So I think that this is an example of how the process is growing now that we are actually seeing these kinds of products showing up in developed countries and in international markets far beyond the borders of Africa.

We see this phenomenon in—not only Africa, but particularly Southeast Asia, where a number of turtle species are going into the food market. Our concern is that this is growing, and perhaps bushmeat in Latin America may be the next focal point. So it is leading the demand.

Mr. GILCHREST. As we move to try to find solutions to this problem and create a strategy, the United States, I guess, works with various elements in the international community. How does State, Fish and Wildlife, and USAID collaborate in this arena?

Dr. STANSELL. I can certainly start to answer your question. Fish and Wildlife Service has, through at least the two grant programs that are directly related to conservation of elephants and great apes, we are able to provide actual—

Mr. GILCHREST. Well, actually what I meant was do the three of you or your representatives collaborate on the U.S. end as you engage the international community? Mr. Burnam, Dr. Stansell, and Mr. Graham, do you three or your representatives discuss this issue in both the particulars and the big picture, maybe as far as you have a region in the Congo or you are dealing with Liberia or Sierra Leone or Guinea or some other place, in your strategy do you include the medical community for the problems of disease? Do you include the Department of Agriculture to create an agricultural corridor or an agricultural zone to tap the kinds of potentials that could be a food source? Do you collaborate with the enforcers, the eco-guards, you know, the full range—the nonprofits that are out there? Is there a fairly coordinated, united front from the U.S. perspective?

Mr. BURNAM. Well, Mr. Chairman, forest law enforcement has been a major diplomatic initiative of the U.S. Department of State. In fact, President Bush has offered to help developing nations combat illegal logging. And as we began to look at that issue, we realized that the illegal trade in wildlife is intimately related to illegal logging because of the connection I tried to bring out in my testi-

mony. So we have been studying the issue on an interagency basis. Jim and I were in the Congo for a planning meeting on forest law enforcement. That is what we were there for. But as soon as you take up the issue of forest law enforcement, you realize logging is both sort of a problem and a solution. It is a problem because it opens up the roads, but it also offers the opportunity to do some of the things that the CARPE program and WCS and others have been working on.

So there is a good deal of attention in the Administration to this problem, which has been heightened by your hearing, and—

Mr. GILCHREST. Did you say "tension" in the Administration or "attention"?

Mr. BURNAM. I am sorry. Attention to it.

Mr. GILCHREST. Attention.

[Laughter.]

Mr. BURNAM. Oh, there is no tension in this area. I am glad you corrected the record.

Mr. GILCHREST. When we look at this issue—and I don't want to broaden it beyond the scope of the hearing, necessarily. But we are looking at an area of the world where there is difficulty because of the banking system. The economic infrastructure, in some cases, is totally absent. The cultural differences of private property versus no concept of private property, the investment potential, there is just a myriad of issues out there that make it very difficult to make a connection where there is very steady progress.

When I go to my district, people are always saying, "What are you doing to bring us jobs?" Well, you know, they say that to every Member of Congress. But there are some aspects of economic growth in this country that are pretty standard and almost taken for granted. But if you move into an arena where you are working in West Africa and Central Africa, in much of Africa, it seems that you are starting at the very beginning. Each decade we start at the very beginning to try to develop something that will take hold.

As you work with these governments—and I would assume probably there is a great deal being done. And I guess to bring the point home, when I was in Addis and in Mozambique and a number of other countries, and we sat down with members of parliament or the prime minister, there was an overwhelming sense of trials and the difficulties that lie ahead in stabilizing governments and countries where what we take for granted is absent almost in its entirety.

So would State, would USAID, and the myriad of programs that you have throughout the continent, as you move through with these reborn logging folks and local people and create in some way a sense of a stable government based in the early stages on the rule of law, equal opportunity, representative democracy, the concept of private property, those kinds of things?

Mr. BURNAM. I think you have focused very eloquently on the factors that need to be addressed. You know, the Administration believes that sustainable development has three pillars: the environmental, the economic, and the social. And you really have to—all those three pillars have to be strong if you are going to have sustainable development. You cannot have—you cannot just draw a line on a map and create a park and say, OK, we have protected

biodiversity. You have got to have the economic and the social component. As you pointed out, you have to provide a better livelihood for the people and a better income for the people.

Some of the forests in Central Africa are still relatively untouched. The resources that are there, many people within the Congo Basin themselves are unaware of. There are waterfalls that were discovered last June. There is a vast area here of untouched moist forest, but riddled with logging concessions at the moment. And so the question is—

Mr. GILCHREST. Where did the logging concessions come from?

Mr. BURNAM. From the government. The government will—this are national—

Mr. GILCHREST. And this is a source of revenue for the government?

Mr. BURNAM. The government, in some cases, yes, it is viewed as a source of revenue, although the concessions are often simply given out with the expectation that the economic development, which—

Mr. GILCHREST. Is there any criteria that the government uses to issue these concessions?

Mr. BURNAM. Yes, there are.

Mr. GILCHREST. Such as conservation—

Mr. BURNAM. Yes, and most of the governments have within the past few years revised or are in the process of revising their forestry laws.

I guess the point I am trying to make, in the Congo we are kind of—we are at the fork in the road, and the question is which way do we go. Do we move toward a system of sustainable forestry with controls on wildlife harvesting? Or do we keep going down the road of basically, you know, unregulated activity? So I think it is a very—and the game isn't over yet. There are a lot of opportunities to build on what the CARPE program has already done. And so I think it is a place where we should be focusing our attention and where the kind of focused effort that you are calling for is, in fact, needed.

Mr. GILCHREST. Do you have any recommendations for the Congress in this regard?

Mr. BURNAM. Well, we will come back here with recommendations if we develop some.

Mr. GILCHREST. Dr. Stansell? Mr. Graham?

Mr. GRAHAM. I didn't have recommendations for the Congress. I just wanted to underline the partnership among the three of us, our institutions. I would bring to your attention a book that the CARPE project has put down lessons learned over the last 5 years, and I believe that this supports what Mr. Burnam has indicated, that we are at a fork in the road. We have learned a lot about the kinds of issues that are taking place in the Congo Basin, broadly put, and also in detail on the bushmeat crisis. And I believe that the partnership, the three institutions that are sitting here are collaborating formally and informally to try to address these. And I just wish for you to realize that this is a process that is going ahead.

Mr. GILCHREST. Thank you very much.

Dr. Stansell?

Dr. STANSELL. Yes, thank you, Mr. Chairman. I would only add that this is an extensive problem, as you have indicated, that really gets at the heart of the social structure on the continent.

That said, I would hope that we didn't lose sight of the fact that there is an awful lot that we are doing, there is an awful lot that we can continue to do, while we are trying to sort out all of the bigger issues, the bigger social issues that underlie this crisis. So I would just ask that we continue to support, to the extent that we can, the collaborative efforts that we have got going. We have participated in a dozen or so projects through our various grant programs that really have provided—

Mr. GILCHREST. How much money is in the grant programs?

Dr. STANSELL. Right now we have $1 million in our elephant grant program, $1 million in our great apes program, and—

Mr. GILCHREST. These grants go to—

Dr. STANSELL. These grants go to on-the-ground projects, either through participating nongovernmental organizations or working directly with the African governments. And they really do bring—it is a small focus, but they bring a focus to the kinds of solutions that we have talked about today. A perfect example is through CARPE we have collaborated in providing additional funds for game guards, some very specific things that can be done today to achieve a solution to those problems.

Mr. GILCHREST. Would you say a country like Liberia is lost or is there anybody working in Liberia right now? Can that country and its wildlife be saved?

Dr. STANSELL. I don't know specifically about activities in Liberia, but I do know enough about the country to know that the answer is yes. Habitat is still there. If you look back at the turn of the century in the United States and count the number of wild turkeys or white-tail deer or wood ducks, with all the market-based hunting that was going on at that point in time. So I do believe that we still have time, but it is running out, and the kinds of activities that we can move forward are going to be critical.

Mr. GILCHREST. Is USAID in Liberia right now? Are they back in Liberia? Anybody in Liberia?

Mr. GRAHAM. I believe that USAID still has a presence associated with Liberia. I am not sure whether it is in Monrovia or in a separate city serving the interests of trying to keep a presence in Liberia. Exactly what it is doing in regard to the environment, I am sorry, Mr. Chairman, I am not privy. I just simply don't know.

Mr. GILCHREST. Sierra Leone?

Mr. GRAHAM. The same would be true in Sierra Leone. I do know that USAID has activities that are associated with Sierra Leone, but, again, I believe it is being managed out of another city.

Mr. GILCHREST. I see. So you get some brave souls to go in there. So your sense of the crisis is it is truly solvable, it can get better? Is there some hope that the world's great species will survive through this century?

Mr. BURNAM. Oh, yes. I think we are at a fork in the road, as I said. You know, there are a lot more elephants in Africa than we thought. When they first went into Gabon to survey the forests there in the 1980's, they thought there were only 5,000 elephants in Africa. Well, there are about 100,000 elephants in Gabon. These

areas are—I was at one clearing where I saw 87 elephants in one clearing. I mean, this Congo has enormous natural resources that are there, and the whole question is: Are the governments and the NGO's and the other countries other than the United States, such as Germany and France and Great Britain, are we going—the European Union has some programs in the area. Are we going to really focus our efforts now and try to build on what has been done in the past 5 years? That is really the issue.

Mr. GILCHREST. The last question. I know there is just a myriad of things to do and ways to approach this and dollars that need to be spent and so on and so forth. Would you say—with all the things that need to be done, what is the most difficult problem in an ongoing solution? Is it competent, stable governments?

Mr. BURNAM. From my perspective, I think I would just cite one factor as—I think competent, stable governments, respect for the rule of law, are the heart of the problem. But, you know, simply sending out eco-guards to catch poachers isn't by itself going to do the trick. So I think the political and the economic and the social aspects have to be addressed in an integrated manner.

Mr. GILCHREST. Very good.

Dr. STANSELL. I think I would only add to that that, of course, you have to have stability, at least to a degree, within the governments, but I think that the longer-term issue is developing a long-term land-use strategy and forest development strategy that would address many of these kinds of issues, and then moving forward in a collective global approach to try to get that kind of strategy implemented on a country-by-country basis where the stability would allow it. We are talking about a vast area that has geopolitical boundaries that are just that. We can almost pick and choose in those areas where it is stable enough to work. So if we could collectively move forward, I would think that would probably be the most important thing that we could do to achieve this.

Mr. GRAHAM. I would like to simply make a complementary addition to the previous two speakers, but also to add that one of the real resources in Africa are the people. And the level of human resources there varies from very, very, very sound, professional, accomplished individuals to people who really are out in the bush, literally and figuratively. And we need to invest in those people.

One of the great things that is harming the investment in those people, of course, is the diseases that are taking so many of them away. But the human resource capacity building is an extremely important complement to what the previous speakers have already indicated.

Thank you, sir.

Mr. GILCHREST. Thank you very much. Gentlemen, this has been very helpful and inspiring. We would like to stay engaged with each of you as the process moves along over the coming decades.

Mr. Burnam, Dr. Stansell, and Mr. Graham, thank you very much, gentlemen.

Mr. BURNAM. Thank you, Mr. Chairman.

Dr. STANSELL. Thank you.

Mr. GRAHAM. Thank you.

Mr. GILCHREST. Our next panel will be: Mr. Marcellin Agnagna, Chairman, CITES Bushmeat Working Group; Dr. Michael

Hutchins, Director of the Department of Conservation and Science, American Zoo and Aquarium Association, and Co-Chairman, Bushmeat Crisis Task Force; Dr. Richard Carroll, Endangered Species West and Central Africa Programs, World Wildlife Fund; Dr. John Robinson, Vice President and Director of Wildlife Conservation Society; Dr. Mohamed Bakarr, Senior Technical Director, Center for Applied Biodiversity Science at Conservation International.

I think there are more seats, if everybody wants to sit down.

I want to thank the witnesses for traveling here now this afternoon. We look forward to engaging you in your testimony, and, Mr. Agnagna, you may begin, sir.

STATEMENT OF MARCELLIN AGNAGNA, CHAIRMAN, CITES BUSHMEAT WORKING GROUP

Mr. AGNAGNA. Thank you, Mr. Chairman, for the opportunity to speak to this Committee concerning a very important challenge facing all Central Africans—the bushmeat crisis. But first I would like you to excuse me because of my English. I usually speak French, but I am going to try to express myself in English.

Mr. GILCHREST. If it becomes difficult, you can speak French. Someone will interpret. But you are doing just fine, sir.

Mr. AGNAGNA. Thank you. I was going to say that the massive African equatorial forest is the second largest humid tropical forest in the world after the Amazon, both in size and its biological wealth. It is an unequaled refuge for a number of species of fauna and flora, some of which remain to be discovered, while others are threatened with disappearance.

This immense natural resource heritage continues to be the principal source of meeting the vital needs of the peoples of the Central African forest. The subsistence needs of yesterday have yielded to an improper lucrative exploitation of natural resources beyond reasonable limits and, most notably, the commerce of bushmeat.

The situation is complicated and enhanced by the armed conflicts and logging activity in the region and the accompanying proliferation of weapons that are now used for poaching. Networks of well-equipped and well-organized poachers empty the forests using Kalashnikov rifles to feed the urban centers, penalizing the village populations that essentially depend on bushmeat for their survival. Suddenly there is a food security problem at the village level, and it is necessary that the new management strategies take into account traditional and long-forgotten knowledge.

The use of natural resources was essentially for subsistence. Vital activities such as hunting, fishing, and cutting large trees in the forest were well regulated and often subjected to rituals.

Species such as the leopard, bongo antelope, Nile crocodile, elephant, and the hippopotamus, to name a few, were revered by most of the tribes in Central Africa, and often were animals totemic or emblematic in the Bantu culture.

Although prized by most of the Africans, bushmeat is a commodity that was not consumed daily It constituted an exceptional meal and was often reserved for special occasions. Even after the advent of firearms at independence, the tradition always was respected. Every weapon that entered the forest was only authorized

to take a quota established by the chief. Bushmeat was not marketed but was consumed only inside the hunting territory.

Unfortunately, this effective type of management, adapted to the African context, was rejected under the pretense of modernity or economic development.

The economies of most countries of the region are supported either by oil or forest exploration. Logging constitutes the first or the second source of income to most of the countries of the region.

Logging plays a very important role in growth of the illegal bushmeat trade and constitutes a serious threat to wildlife. The present situation is catastrophic in all the countries of Central Africa. At the start, it was simply a matter of small quantities for family usage, but this new type of city dwellers whose purchasing power was growing with employment found in the city began passing larger orders. The existing market and the increased requests provoked an unprecedented explosion of commerce of wild products, bushmeat in particular. It was more or less in the same manner that bushmeat found its place in the exotic restaurants of Western cities, such as Paris, London, Brussels, New York, and Washington.

Some important efforts are underway in the region at the political level to mitigate the crisis, including establishment of consultative frameworks. The CEFDHAC, the COMIFAC, and the success of the Yaounde Declaration are illustrations of regional political will.

One action which is taking place is the CITES Bushmeat Working Group. Approved by the CITES Secretariat in April 2000, this group has developed a five-point action plan and has secured the basic funds to operate a central office with support from National Bushmeat Officers. The five priority actions are: to review policy and legislation in the region with reference to bushmeat and establish a harmonization of this legislation for the region; create a regionwide public awareness campaign regarding the impacts of the illegal, commercial bushmeat trade and impacts on cultural heritage; develop a bushmeat trade monitoring system in conjunction with the CITES/MIKE; establish a regional approach to wildlife management and bushmeat control in logging concessions; and provide training and capacity building to bushmeat officers, ministry personnel, and law enforcement agents regarding the bushmeat trade.

It is important to note that the approach taken by this group is not to forbid the consumption of bushmeat for those who actually need it but, rather, to increase strategies of sustainable use while developing alternative protein and income sources for local populations.

To attain this objective, there are needs for more time and resources than the CITES Bushmeat Working Group alone has available. The international community is being summoned, and the Central African countries need international support to fight against this scourge that not only is decimating the wildlife habitat but is also a dangerous threat to the wildlife of the forest people—threat to the life of the forest people, notably the Pygmies.

And to finish, I would say that the bushmeat trade kills the wildlife, but is also killing the village.

Thank you very much.

[The prepared statement of Mr. Agnagna follows:]

Statement of Marcellin Agnagna, Chair, CITES Bushmeat Working Group

The massive African equatorial forest, whose inhabitants are of Bantu Pygmy origin, dominates the Central Africa region. This humid tropical forest contains portions of six countries: Cameroon, Gabon, Equatorial Guinea, the Republic of Congo, the Central African Republic, and the Democratic Republic of the Congo. This forest is the second largest humid tropical forest in the world after the Amazon, both in size and its biological wealth. Various expeditions, scientific and other, conducted in the region during the last decade, made apparent the immensity of the biological, ecological and cultural potential of this forest of Central Africa. It is an unequaled refuge for a number of species of fauna and flora, some of which remain to be discovered, while others are threatened with disappearance. In Democratic Republic of the Congo, for example, more than 4,009 species of mammals, 1,086 species of birds, and 1,060 species of fishes have been identified. In the Republic of Congo (Brazzaville), 45 species of reptiles, more than 450 species of mammals, and 600 species have been identified.

This immense natural resource heritage continues to be the principal source of meeting the vital needs of the peoples of the Central African forest. With no pastoral tradition, generations of forest dwellers through myths, beliefs and customs, established sacred rules of management of the resources that are essential to their survival. The rational or sustainable management notion, therefore, is not a new concept for these peoples, who already by tradition were involved in the management and monitoring of such vital activities as fishing, hunting and gathering (i.e. mushrooms, caterpillars, and wild fruit). Nevertheless today, all these sacred rules are trampled under foot, on the pretense of modernism and economic development. The subsistence needs of yesterday have yielded to an improper lucrative exploitation of natural resources beyond reasonable limits and most notably, the commerce of bushmeat.

In Central Africa, the bushmeat trade is currently one of the sources of income for many of the inhabitants of forested areas. The development of logging has brought relatively large amounts of money to formerly isolated areas and human populations that were once exempt of excessive consumption habits. Poachers and game traders now use logging roads and other transportation means to bring illegally captured meat to market in the cities. The thousands of workers and their families, employed by the forestry companies, constitute a potential market for bushmeat, especially as logging companies usually prefer to ignore their employees' protein needs. This situation is complicated and enhanced by the armed conflicts of the region and the accompanying proliferation of weapons that are now used for poaching.

The commerce of bushmeat is suddenly the principal income source for a good number of the inhabitants in areas that still hold wildlife. The conditions that favor the development of this activity are numerous, among which are unemployment, poverty, growing demand for the meat of wild animals (and thus, the existence of the market), demographic growth, development of logging on a large scale and ignorance, among others.

The bushmeat trade takes on enormous proportions throughout all Central Africa. In all the markets of the large urban centers such as Libreville, Yaoundé, Bata, Bangui, Kinshasa, Brazzaville, Pointe Noire, Malabo, or Douala, bushmeat is openly and consistently sold, whatever the season, despite its illegality. The quantities are disturbing and sufficiently illustrate the problem. In Pointe Noire, second largest city and economical capital of the Congo, a study carried out in 1996 (PROGECAP) estimated that 150,000 metric tons of bushmeat is consumed annually. It is certain that the current rate is now double. Libreville, capital of Gabon, receives daily shipments of bushmeat by railway. About 1,200 metric tons of bushmeat flows into the markets of Libreville daily. Bangui consumes about 120,000 metric tons of bushmeat yearly; Bata, second largest city of Equatorial Guinea, daily offers a gruesome spectacle in its central market where transport vehicles bring piles of the whole animal carcasses of all species. All the species are impacted and some are threatened with extinction, notably the large animals such as duikers, gorillas, chimpanzees, and elephants.

Everywhere in Central Africa, the bushmeat trade has become a true scourge that threatens the survival of several wildlife species and is of greatest conservation concern. The scarcity of game around some forest towns forces the inhabitants to leave. Networks of well equipped and well organized poachers empty the forests using Kalashnikov rifles to feed the urban centers, penalizing the village populations that essentially depend on bushmeat for their survival. Suddenly there is a food security

problem at the village level, necessitating the use of more costly hunting methods that most villagers cannot afford. Some villagers are obliged to constantly roam in search of a better life in urban areas or forestry concessions. Although illegal in most countries of the region, the bushmeat trade is expanding, with the governments lacking the capacity to enforce the laws. The international community is being summoned. The Central African countries need international support to fight against this scourge that not only is decimating their wildlife heritage, but is also dangerous threat to the life of the forest peoples, notably the Pygmies. The bushmeat trade kills the wildlife and the village.

The problem is complex, and the solutions cannot be found solely in classic conservation approaches. It is necessary, therefore, that new management strategies take into account traditional and long-forgotten knowledge; a return to traditional management seems inevitable. The participative management concept could be improved while taking into account the traditional values of forest peoples.

Important efforts are underway in the region at the political level, including the establishment of consultative frameworks. The CEFDHAC (Conference on the Ecosystems of Dense and Humid Forests of Central Africa), COMIFAC (the Conference of the Ministers in charge of the Forests of Central Africa), and the success of the Yaoundé Declaration are illustrations of regional political will. Nevertheless, the governments of the countries of this region do not have the means to deal with this scourge. International support would be most welcome.

This political will is now augmented by the CITES Bushmeat Working Group [Appendix A] (CITES BWG), set up by Decision 11.166 of the Conference of the Parties to CITES in Nairobi Kenya in April 2000. The CITES BWG brings together all the Directors of the Central African Region, and their support staff, who are in charge of wildlife management and protected areas. Since its inception, this group has met several times with assistance of the international community, notably the Government of the United Kingdom, the United States, thought the U.S. Fish and Wildlife Service (USFWS), and the Bushmeat Crisis Task Force (BCTF). An action plan was developed and is being executed with funding of $135,000, obtained by the BCTF from the John D. and Catherine T. MacArthur Foundation. This financing, along with support from USAID's Central Africa Regional Program for the Environment (CARPE), is being used to execute the action plan and also permits the installation of a Regional Coordinator based in Yaoundé, Cameroon.

The BCTF closely collaborates with the CITES BWG and is helping to find additional funds from international sources, as it is now an international problem. It is not unusual to find African bushmeat in the restaurants of certain capitals such as London, Brussels, New York, and Washington. Well organized distribution networks allow the feeding of far-flung international markets The airlines that link Africa to the West play a very important role in this traffic. Just some months ago, I flew on an Air France flight from Brazzaville to Paris. To my surprise, I saw some passengers hurrying to embark with their accompanied luggage: suitcases full of bushmeat and of smoked freshwater fish, within the full view and knowledge of the customs officers that gladly helped to close the suitcases after their "inspection." The practice takes place in almost all the airports of Central Africa. The domestic airlines that connect large urban centers to the internal cities carry large quantities of bushmeat, as do other means of transport such as trains and boats. This situation is serious and demands the special attention of the international community.

TRADITIONAL MANAGEMENT OF NATURAL RESOURCES.

To make a shift from classic conservation theory, we want here to focus on traditional management of the natural resources. In fact before and during the colonial period, the people of Africa had established natural resource management systems based on the respect of mythological beliefs. Every activity linked to the use of natural resources followed precise rules. It was not anarchical, but instead disciplined and respectful of established order. The system worked well, it did not need law enforcement agents to assure respect for the rules because they were inviolable. Mankind treated nature with care because we were conscious that our survival depended on it. The use of natural resources was essentially for subsistence. Vital activities such as hunting, fishing, and cutting large trees in the forest were well regulated and often subjected to rituals.

Traditional Hunting and Fishing: Traditional hunting was practiced for a long time for subsistence and was subject to rules that varied from one ethnic group to another. With the Bantu-speaking peoples of Central Africa, for example, every clan or ethnic group had a territory or well delimited zone used for hunting. Access and hunting could not take place without the authorization of the traditional chief. A quota system existed by species and included some forbidden prey species. The be-

lief was that spirits protected certain forbidden species, the taboos and other myths created beliefs surrounding them were inviolable barriers.

Respect for tradition was severe. Species such as the leopard, bongo antelope, Nile crocodile, elephant, and the hippopotamus, to name a few, were revered by most of the tribes in Central Africa, and often were animals totemic or emblematic in the Bantu culture. Also, big game hunts were only practiced for special occasions. Killing an elephant, for example, took place with an agreement between neighboring villages or clans. With the tribe of the "Kouyous" in the north of the Republic of the Congo (Brazzaville), one organized a festival of folk dances and demonstrations of strength during a week before the elephant hunting party. The hunters were chosen among the elite of the town and then were prepared. For a full week they received spiritual blessings that protected them against the forces of the evil. Only after all these formalities did the hunters enter the forest to confront an elephant. The clan chiefs accompanied them at the end of the hunt to give them some final blessings. Every hunter carried with him a full measure of provisions and protection of amulets (talismans) and three to four previously-prepared and blessed spears of mystical strength. It was then that hunters began the long march tracking elephants. A large bull elephant "Kamba" was sought. Once the tracks were found, he was followed to the end. The endowed hunters were able to make themselves invisible "Indzombi" and approached the beast and finally pierced him in vital areas with their well sharpened spears, before disappearing into the forest and again reappearing in a place that was identified in advance. After reappearing, they returned to the assault by following the blood tracks and killing the animal if it has withstood the first attack. This process could repeat itself as much as necessary.

The parties hunting small game were organized in forms of a collective between the inhabitants of a village or of neighbors, who used nets, traditional weapons such as spears, lances, harpoons, and hunting dogs. The meat was distributed freely among the inhabitants of the town, with every family receiving its share, however small is was.

Although prized by most of the Africans, bushmeat is a commodity that was not consumed daily. It constituted an exceptional meal and was often reserved for special occasions (family gatherings, initiation ceremonies, festivals of traditional dances, etc.). Twenty years ago, this was practiced in most villages of the region. Even after advent of firearms at Independence, the tradition always was respected. The names of the possessors of firearms was known in every town. The use of these weapons was verified and monitored. Every weapon that entered the forest was only authorized to take a quota established by the chief. The arm owner could only sell the part that was surplus to his need. Bushmeat was not marketed but was consumed only inside the hunting territory.

I remember during my youth in northern Congo, that my grandfather, with the name of notable Agnagna, was customary chief of the region of "Loko" in the area of Owando (Fort Rousset). The notable Agnagna was a powerful and respected traditional chief that embodied the life of the inhabitants of Loko. It was he who gave the order to hunt, and it was to him that all hunters had to present the rewards of the hunt before any meat was eaten. He received the right hind leg and the trophy (horns, skins or head). The trophies were collected and kept in a sacred place where access was uniquely reserved to the initiated. A fire was lit there in permanence for the conservation of the trophies. The trophies were exposed during period ceremonies and served to inventory the number of game hunted during a given period. It was also a customary heritage and symbol of strength.

The largest collection of trophies that I saw in my youth belonged to a big chief of the tribe of the "Kouyous" by the name of "Etoumbakoundou". He lived in a village called Kouyougandza situated downstream of the city of Owando (former Fort Rousset) on the river Kouyou. This collection included pieces of very big value of which the dimensions were almost always records: antelope horns, leopard skins and those of other animals, hippo teeth, cranes and cane cats, feathers of rare bird, and elephant tusks. The notable Etoumbakoundou uniformly received visits from white settlers (colonial administrators) and a few tourists. The visitors' interest in the trophies led them to take one or more before leaving. I remember in 1963, when one of the last colonial administrators, whose name escapes me, the Commander of the Prefecture of Likouala–Mossaka, visited Kouyougandza. He left with a gigantic pair of elephant tusks. Six men were necessary to lift each tusk, whose weight may have reached 120 kilograms. The boat used by the Commander could not bear the weight of the tusks, and some passengers had to be left out and later transported on a second trip.

I was greatly disappointed to note that at the time of my passage to Kouyougandza in 1986, that all of the trophies had disappeared after the death of the Chief Etoumbakoundou in 1974. An entire culture had disappeared.

Fishing in freshwater was also seasonal. For example, the draining of ponds for fish followed a ritual. During the dry season of 1965, I witnessed the draining of a pond called "Etsibi" in the zone of "Loko" under the authority of the notable Agnagna. In fact, the Etsibi Pond had a diameter of approximately 50 meters, and it articulated with the Kouyou River through a small canal that dried in dry season. "Etsibi" was forbidden to visit in period of the high waters. In it lived a large Nile crocodile that only the Chief Agnagna could observe.

Baskets were used to drain the pond, and men, women, and children of the villages surrounding "Ossambou" camped around Etsibi during the event. Before the draining of the pond, a ritual was conducted in which Chief Agnagna struck the surface of the water with a stick and ordered the gigantic crocodile to leave. One could see this 6-meter long monster leave the pond and head toward the Kouyou River using the canal. After this, the spectacle began. The quantity of fish collected was enormous. The fish was smoked to conserve it for future needs. This is an example of the manner used by one tribe to manage their natural heritage. The efficiency of this traditional form of management was clearly established.

Unfortunately this effective type of management, adapted to the African context, was rejected under the pretense of modernity or economic development. Now modern conservation laws have shown their limits and cannot alone solve the problem of the management of natural resources in Central Africa. The customary knowledge that has been long forgotten merits revival.

CURRENT SITUATION

The problem of managing forest resources in Central Africa gives rise today to several questions. The economies of most countries of the region are supported either by oil or forest exploitation. Logging constitutes the first or second source of income to most of the countries of the region. For example, in Gabon, where oil reserves are being exhausted, the plan is to then exploit the forest resources for wood. The policy is to develop a logging industry, which is considered a means of development. Nevertheless, questions can be posed about the effect this policy will have upon gross national product and on local human populations who are dependent on the forest.

In Central Africa almost all the logging companies are foreign owned. They cut and sell the wood on the international market while paying derisory taxes to the national government. Wood is given up almost free of charge, while logging companies do not conduct reforestation procedures. The logging methods are devastating. Some speak of selective cutting that consists of exploiting only the largest trees with the highest commercial value. In the northern Congo for example, the most sought-after species is of the genus Entandophragma (Sipo and Sapeli). It is not unusual to see a road of several kilometers cut for a single sapeli tree. In the process, dozens of other trees may be destroyed. The damage to the flora and fauna are huge. As for the village communities, they seem to enjoy a short-lived well being as long as there are desirable trees to cut. After that, they are left alone in a state of abject poverty.

We can include some other negative effects of logging. The prospection teams and other workers essentially nourish themselves with bushmeat. The forest roads and the wood transport vehicles carry all sorts of forest products including elephant ivory, animal skins and bushmeat. The logging work sites are transformed into immense cities wherein thousands of people reside. Merchants of all kinds spring up because of the workers' salaries. Basic goods are sold in small shops. But behind the counters, merchants disregard the law and traffic in wildlife products such as ivory and leopard skins.

In Pokola, northern Congo, for example, in a worksite created by the logging company CIB (Industrial Congolese Wood), the bushmeat trade is very well developed. Despite the strong local demand, large quantities of bushmeat are transported out of the country, notably to the neighboring Cameroon. Professional poachers install themselves alongside the forest roads and quietly operate with the complicity of the drivers of logging vehicles, who bring the illegal bushmeat to distant markets. All the species are slaughtered without restriction, the large game is preferred as it yields more profit. Even the species once protected by local taboos and beliefs such as the Bongo antelope, are poached. In the Pokola bushmeat market, one can daily find meat of almost all species of forest animals. The taboo myth was shattered with the intermingling of cultures among people who arrived in the area to work for the loggers.

Logging plays a very important role in growth of the illegal bushmeat trade and constitutes a serious threat to wildlife. The forest roads open for removal of logs are used by the poachers to reach game-rich areas that were previously inaccessible. In northern Congo near the border with the Central African Republic in the zone

Enyele, where the logging company called ITBL operates, large camps of Central African poachers are installed in permanent camps. They illegally hunt and traffic bushmeat to feed the markets of Mbaiki and Bangui in the Central African Republic. It should be noted that the CAR once had forests rich in wildlife, but it has apparently been destroyed by the bushmeat trade. Central African hunters now focus on Congo as a source of game.

Former soldiers of the army of former Zairean President Mobutu Sese Seko have hidden arms in the villages downstream of Bangui and of Nzongo (in the DRC). These stocks of munitions and arms are now used for poaching. These ex-soldiers have become professional poachers and operate on well organized circuits, and in certain cases, supported by the Central African Waters and Forests agents. Elephant poaching is very common in this zone, and their meat is sold in the CAR or elsewhere. The Central African Waters and Forests agents extract an unofficial tax that varies between 1,000 to 2,000 French CFA ($2 to 3$ US) on every 50 kg bag of elephant meat that is then freely sold in the markets of Bangui, despite the elephant's protected legal status.

The present situation is catastrophic in all the countries of the Central African region. Tons of bushmeat are sold daily on the markets of the big urban centers. In Bata, Equatorial Guinea for example, the daily bushmeat market contains hundreds of baboons piled up for sale. It is estimated that residents of neighboring Libreville, Gabon consume more than 350,000 metric tons of bushmeat each year.

In witnessing this, one wonders if the Central African countries have game laws. In fact, some of them have very good laws on paper, although other countries need considerable revisions. However, none of them effectively regulate the commerce of bushmeat, and it is sold openly under the eyes of the authorities whose job it is to control the illegal trade.

WHY THE FOREST INHABITANTS OF CENTRAL AFRICA CONSUME BUSHMEAT

As previously noted, the climatic and ecological conditions of the humid tropical forest are hostile to raising cattle, and native people are obligated to rely on protein from the forests and rivers. Over several generations, myths, traditions, and a cultural preference for bushmeat grew among the inhabitants of the forest. These days, almost every family has some chickens. But poultry is used for the reception of special guests or saved for special ceremonies. Families prefer eating bushmeat.

Therefore, there is a problem caused by people's food preference. Bushmeat often is considered as of better quality by its consumers, and this seems justified if one considers the low fat content of game meat. Still, the recent epidemics of Ebola or HIV/AIDS may originate from the contact between humans and hunted animals. This situation raises many questions: When did the bushmeat problem first appear? Was it not the appearance of modernization? Did not the ancestors live in harmony with nature? What does one say to the pygmies who have always lived in the forest? Did they know of the problems of HIV and other pathologies of the modern world? And what of the forest, wasn't it a holy place before the penetration of machines and other arsenals used to exploit her resources? Will bushmeat have to be forbidden for consumption? What alternatives are there for the people of the forest to eat? The answers to these questions will edify the approach to developing solutions to the bushmeat problem.

The peoples of the forest always kept their food habits even when they migrated far from their region of origin. Most of the urban centers of the region are populated by rural migrants who have not abandoned their habits. Even in the city they have a tendency to keep their original food preferences such as bushmeat in the forest zone, and grasshoppers, caterpillars and other in savannah zones). Suddenly illegal dealings in forest products began developing (bushmeat, fruit and wild vegetables, palm wine etc.) from the country towards the city. At the start it was simply a matter of small quantities for family usage, but this new type of city-dwellers whose purchasing power was growing with employment found in the city began passing larger orders. The existing market and the increased requests provoked an unprecedented explosion of commerce of wild products, bushmeat in particular. It was more or less in the same manner that bushmeat found its place in the exotic restaurants of western cities.

THE SOLUTIONS

The bushmeat crisis in Central Africa is a daily preoccupation regarding management and conservation of the forest resources in the region. All the actors, at the political level, administrative, scientific and private became aware of the seriousness of the problem and are working hard to look for solutions which will minimize impacts. In all the regional forums treating biodiversity conservation questions

bushmeat is always central to the discussion. As was expressed, political will to find solutions to the management problems of the forest resources is evident in the region. Some encouraging regional initiatives include CEFDHAC, the COMIFAC and the reformation of OCFSA (Organization for the Conservation of the Wildlife in Africa). Nevertheless this political will is far from realizing its financial and equipment needs. The recommendations and other suggestions for solutions resulting from these discussions have barely begun to be implemented.

One action which is taking place as was mentioned previously is the CITES Bushmeat Working Group. Approved by the CITES Secretariat in April 2000 this group has developed a five point action plan and has secured the basic funds to operate a central office with support from National Bushmeat Officers. The five priority actions of this group, represented by the directors of wildlife and protected areas from all Central Africa are: to review policy and legislation in the region with reference to bushmeat and establish a harmonization of this legislation for the region; create a region-wide public awareness campaign regarding the impacts of the illegal, commercial bushmeat trade and impacts on cultural heritage; develop a bushmeat trade monitoring system in conjunction with the CITES/MIKE (Monitoring Illegal Killing of Elephants); establish a regional approach to wildlife management and bushmeat control in logging concessions; and provide training and capacity building to bushmeat officers, ministry personnel, and law enforcement agents regarding the bushmeat trade. Base funding for this initiative has been secured and a reauthorization of the group will be submitted at the next Conference of the Parties in Santiago, Chile, November 2002.

It is important to note that the approach taken by this group is not to forbid the consumption of bushmeat for those who actually need it but rather to increase strategies of sustainable use while developing alternate protein and income sources for local populations. It will be important to eliminate the commercial aspect of this trade and its impacts on wildlife populations.

To attain this objective, there are needs for more time and resources than the CITES Bushmeat Working Group alone has available; the international community is called upon to collaborate with African nations to address this crisis. The current dimension of the bushmeat crisis surpasses the regional context and is indeed continental, the solutions to the problem cannot be found without a collaborative effort of the international community.

APPENDIX A: CITES BUSHMEAT WORKING GROUP SUMMARY INFORMATION

The CITES Bushmeat Working Group was recommended in Document 11.44 and approved [Decision 11.166*] in Nairobi, Kenya in April 2000 at the 11th Conference of the Parties (COP) for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The Working Group includes Cameroon, Central African Republic, Democratic Republic of Congo, Republic of Congo (Brazzaville), Equatorial Guinea and Gabon and incorporates these countries as the case study region for underpinning the scope of work and possible solutions for the bushmeat crisis. It also includes a wider range of dissemination group countries, including: Benin, Côte d'Ivoire, Ghana, Republic of Guinea (Conakry), Kenya, Liberia, Mali, Niger, Sierra Leone, Togo, Zambia.

The primary objectives of the CITES BWG are to:

- Set the scope of problems relating to bringing national and cross-border bushmeat issues into the context of a sustainable and legal process;
- Work on identifying solutions that address the scope of problems;
- Facilitating the implementation process in achieving the solutions.

The CITES BWG held its first meeting in Douala, Cameroon in January 2001 where they set forth a scope of work and identified priority actions for the group. The U.S. Fish and Wildlife Service supported a meeting of the members of the core working group along with representatives from dissemination group and donor countries during a special session of the BCTF Collaborative Action Planning Meeting in May 2001 where opportunities for collaboration between BCTF and the CITES BWG were identified.

The CITES BWG held a second formal meeting in Cameroon in July 2001 where they established a framework for their priority actions, which formed the basis of a joint BCTF CITES BWG funding proposal approved by the John D. and Catherine T. MacArthur Foundation. With support from a USAID grant, the BCTF will again be providing an opportunity for the CITES BWG members to meet at the Ecole de Faune de Garoua [Garoua Wildlife College] in March 2002 during the bushmeat curriculum development workshop co-organized by the college and BCTF. During this meeting the CITES BWG will set forth the framework for a three-year implementation plan for the joint proposal funded by the MacArthur Foundation to include

planning for: policy and legislation review, training for bushmeat monitoring and database development, review of wildlife management authority structures, public awareness campaigns in Central Africa, and developing wildlife management guidelines within logging concessions. As a result of the funding from the MacArthur Foundation bushmeat officers in each of the six core countries and a regional coordinator will be supported for the next three years. Matching funds to fulfill the CITES BWG efforts are being supplied by the U.S. Fish and Wildlife Service through a grant from CARPE [Central African Regional Programme for the Environment, USAID] and the UK Wildlife Management Authority.

The CITES BWG has made excellent progress toward developing regular communication among wildlife and protected area directors from the six core countries of the Central Africa region. Having secured funding for priority activities they will be able to develop databases regarding trade in bushmeat, harmonize legislation related to wildlife exploitation and trade, collate information for a regional perspective on bushmeat trade, and raise awareness among the general public in Africa regarding the consumption and exploitation of wildlife. These steps will culminate in a set of recommended solutions that can be 'willingly implemented by range states'.

Decision 11.166 Available from: [http://www.cites.org/eng/decis/11/166.shtml]

Mr. GILCHREST. Thank you, sir.

Dr. Hutchins?

STATEMENT OF MICHAEL HUTCHINS, DIRECTOR/WILLIAM CONWAY CHAIR, DEPARTMENT OF CONSERVATION AND SCIENCE, AMERICAN ZOO AND AQUARIUM ASSOCIATION, AND CO-CHAIRMAN, BUSHMEAT CRISIS TASK FORCE

Mr. HUTCHINS. Yes, thank you, Mr. Chairman, for the opportunity to testify today on the bushmeat crisis in Africa. I am here today representing the Bushmeat Crisis Task Force, or BCTF. BCTF is a coalition of 34 U.S.-based nongovernmental organizations and hundreds of individual experts all committed to resolving the bushmeat crisis. While Africans have hunted and consumed wildlife for millennia, it is only recently that hunting and trading of wildlife has exploded into a multimillion-dollar industry. Millions of tons of animals are being killed and consumed annually, including gorillas, chimpanzees, and elephants. This unsustainable commerce has the potential to empty African landscapes of wildlife in less than a generation.

The African bushmeat crisis is symptomatic of much deeper socioeconomic problems that are affecting the entire continent. The complex causes of the bushmeat crisis, some of which you have heard about today, are interrelated and include growing human populations, widespread poverty, social and political instability, lack of economic or protein alternatives, lack of law enforcement capacity, modernized hunting technologies, and new transportation systems that facilitate the movement of bushmeat from rural areas into urban markets.

The effects of the bushmeat trade will certainly be catastrophic for both people and wildlife. First, the commercial bushmeat trade removes this important resource from the communities that are most dependent upon it. Second, unsustainable hunting risks the irreversible extinction of species across Africa. And, third, the loss of keystone species could alter the structure and function of African ecological systems.

Finally, as, again, you have heard before, butchering and eating wildlife, particularly great apes and other primates, increases the risk that people may contract and spread deadly diseases such as

Ebola. And bushmeat has also been implicated in the emergence of HIV/AIDS.

BCTF recently hosted a meeting of African conservation experts to identify priority solutions, and as a result, we are focusing our collective attention on the following actions: building local capacity to enforce existing wildlife laws; securing long-term funding to maintain a system of well-managed parks and reserves; increasing public awareness of the problem, both in Africa and the United States; regulating hunting and transportation of bushmeat used for commercial purposes; improving agricultural production and consumer access to bushmeat substitutes; building local capacity by training wildlife managers, law enforcement officers, and forestry personnel.

BCTF members are working actively on all these solutions, but we recognize that the scale of the problem is so large that it cannot be effectively addressed without increased government involvement. We, therefore, make the following specific recommendations to the Subcommittee:

First, recognize that unsustainable hunting for bushmeat is the most immediate threat to African wildlife today and that it threatens the livelihood of rural Africans, driving them further into poverty.

Second, identify a Congressional Bushmeat Caucus to collaborate with NGO's and African governments on actions to address the bushmeat crisis.

Third, expand U.S. efforts to improve natural resource management in Africa and, more specifically, help to develop an effective system of protected areas.

And, last, expand U.S. support for sustainable economic development in Africa, including agricultural development.

The bushmeat crisis is a wake-up call to longstanding problems across the continent. We hope that this hearing will put into motion a collaborative global effort to address the significant threat to human welfare and biological diversity. Time is of the essence, however, as our options for intervention will become more limited with every passing year.

Thank you for your interest and attention.

[The prepared statement of Mr. Hutchins follows:]

Statement of Dr. Michael Hutchins, Director/William Conway Chair, Department of Conservation and Science, American Zoo and Aquarium Association, and Co–Chair, Bushmeat Crisis Task Force

Thank you Mr. Chairman and members of the Subcommittee for providing us an opportunity to testify this morning on a looming biodiversity conservation and human welfare crisis in Africa the illegal, commercial exploitation of wild animals for food, commonly referred to as the bushmeat crisis.

My name is Dr. Michael Hutchins, Director/William Conway Chair, Department of Conservation and Science at the American Zoo and Aquarium Association or AZA. I also serve as Co–Chair of the Bushmeat Crisis Task Force Steering Committee.

Established in 1999, BCTF represents over 30 US-based institutions and hundreds of professionals from around the globe, all of whom are committed to working with our partners in Africa, Europe and the U.S. to address the bushmeat crisis.

On behalf of BCTF we would like to commend the Subcommittee and specifically Chairman Gilchrest for the leadership you have shown in identifying the bushmeat crisis as a priority for consideration by the 107th United States Congress.

Increasing demand and the commercialization of bushmeat hunting has eradicated almost all large mammals from unprotected areas in West Africa and threatens to do the same over the next 20 years in Central Africa. East and Southern

Africa are also currently experiencing dramatic increases in illegal, commercial hunting and the data are just beginning to emerge regarding its impacts.

The causes of the current African bushmeat crisis are many including: widespread poverty; increasing consumer demand for meat; development of roads by extractive industries, such as logging, mining and petroleum which have opened up areas that were previously inaccessible; increasing human populations; lack of economic or protein alternatives; social and political instability; lack of capacity to enforce existing laws; and modernization of hunting technologies (guns and wire snares). Due to the complexities associated with the bushmeat trade, any solutions will require a global partnership for long-term success to be achieved.

The problem is really one of scale. To provide a sense of the enormous impact of the bushmeat trade, Central Africans eat approximately the same amount of meat as many Europeans and North Americans, yet over 60% of this comes from indigenous wildlife. In fact, over 1 million metric tons of antelope, primates, elephants and rodents the equivalent of 4 million cattle are killed each year to supply Central African families with what is either their primary source of protein, or a desired luxury. Consumption of bushmeat by large, growing, urban populations, that often view eating bushmeat as a way to reconnect with their cultural traditions is one of many factors fueling the commercial wildlife trade.

Although there is a significant bushmeat trade in Asia and Latin America, BCTF has focused its attention on Africa where the problem is most acute. We are particularly concerned about the Central African rainforests as their productivity is dramatically lower than the savanna ecosystems of East Africa and, as a result, the impacts of even limited commercial hunting are more severe. Except in isolated regions, commercial hunting of large, slow-growing wildlife species such as elephants, gorillas, and chimpanzees already exceeds their replacement rates. Forests are rapidly being emptied of animal life.

Why are we concerned about the bushmeat crisis?

Economics: The bushmeat crisis is not simply a wildlife crisis. Rather, it is a symptom of much deeper socio-economic problems that must be addressed immediately for global security, health, socio-cultural, economic and environmental reasons. Economics is one of the primary driving forces of the bushmeat trade. Much of the African continent lives in a dire state of poverty. The commercial bushmeat trade has emerged as a response to meet the basic needs for food and income resulting from such poverty.

Logging, mining, petroleum and other large-scale extractive industries have facilitated the bushmeat crisis by providing a means to transport meat from the forest to large cities via newly constructed roads. In addition, many companies do not provide food for their employees who often become dependent on bushmeat for their protein needs. For example, BCTF member, the Wildlife Conservation Society, is working with a logging company and the Government of the Republic of Congo to prevent illegal bushmeat hunting inside the logging concession.

The primary source of foreign currency in many African countries is wildlife tourism. Loss of charismatic species could result in less tourism.

Human Health: Consumption of bushmeat also has critical public health implications. Butchering and eating wildlife, particularly apes and other primates, increases the risk that people may contract deadly diseases such as Ebola, and has been suggested as one of the potential vectors for the emergence of HIV/AIDS.

Furthermore, if people cannot meet their basic nutritional needs, they are likely to become more susceptible to disease because of their depressed immune systems. There are numerous communities throughout Africa that are truly dependent on wildlife as a protein source. The commercial bushmeat trade removes this important resource from the communities most dependent upon it.

Ecological/Conservation: Unsustainable hunting risks the irreversible extinction of species unique to Africa and the irreversible loss of value they confer to communities and to the world. These species include bonobos, chimpanzees, gorillas and forest dwelling elephants. Loss of key species could result in irreversible ecological change that could affect the entire forest ecosystem. For example, loss of fruit eaters will alter the seed dispersal patterns of up to 80% of the region's tree species. This could change forest composition and potentially alter rates of carbon sequestration. Loss of grazers could have an equivalent impact on savannah ecosystem structure and function.

Cultural: Certain human communities are at risk of extinction. One example is the Pygmy populations of Central Africa that are losing their traditional hunting and gathering lifestyle. The loss of wildlife from their forest home threatens the very basis of their culture.

What is the BCTF doing to address this crisis?

Collaboration among diverse groups is the primary way to mobilize expertise and resources towards solving the bushmeat crisis. The Bushmeat Crisis Task Force was formed as a result of a growing awareness among conservation professionals working in Africa regarding the dramatic impacts of the illegal, commercial bushmeat trade. BCTF's objectives are to: a) work with the general members of the BCTF to focus attention on the bushmeat crisis in Africa; b) establish an information database and mechanisms for information sharing regarding the bushmeat issue; c) facilitate engagement of African partners and stakeholders in addressing the bushmeat issue; and d) promoting collaborative decision-making, fund-raising and actions among the members and associates of the BCTF.

BCTF recently hosted a meeting of the world's leading experts on the bushmeat issue to identify the priority solutions for the immediate and longer term. They are: policy development, sustainable financing of conservation activities, development of effective protected areas, increasing public awareness, facilitating public-private partnerships, development of economic and protein alternatives, organization of market seller and hunter associations and professional training. BCTF is actively working with its members to assure action is taking place in all these areas.

Policy Development: Appropriate policy development for the long-term, including legislating and enforcing environmental standards is likely to be the most effective way of ensuring that business practices do not have unnecessary detrimental environmental impacts. BCTF has made dramatic progress in policy development in its first two and a half years of operation. First, we have supported the formation and implementation of the CITES Bushmeat Working Group that consists of the heads of the Central African nations' wildlife departments. Second, we prepared the draft IUCN Resolution on Bushmeat that was adopted with modifications. Third, we have supported recent efforts at the Convention on Biological Diversity to enable the formation of a Bushmeat Liaison Group.

Sustainable Financing of Conservation Activities: Securing long-term funding to maintain a network of well-managed parks and resources is essential if we are to protect plants and animals representative of the region's unique biological heritage for future generations. BCTF has been involved in discussions with other organizations exploring mechanisms to fund a sustainable system of protected areas in Africa. BCTF has also assisted its members in seeking grants to implement on-the-ground actions to address the bushmeat issue and also encouraged partnerships between and collective action by members.

Development of Effective Protected Areas: Protected areas are critical because they are the only locations on the planet where biodiversity conservation is valued more than economics, and wildlife can be safe from the hunter's gun and the trapper's snare. As an organization BCTF has emphasized the need for long-term support of African protected areas. Many BCTF members such as World Wildlife Fund, Conservation International and the Wildlife Conservation Society have been extremely active in assisting African nations in the development of national parks and equivalent reserves.

Increasing Public Awareness: Awareness campaigns across Africa are essential in the short term. Several efforts have begun to emerge which link cultural heritage with the information regarding the dramatic losses of wildlife. These efforts are reporting dramatic and immediate impacts with bushmeat sellers choosing to switch to alternative forms of meat. In the US, we are developing educational outreach materials to be used by BCTF supporting members and partners in educating the American public. We are also developing a longer-term effort to support public awareness campaigns across Africa with our many partners on the ground.

We have established a Web site (www.bushmeat.org) and a global information network of experts, compiled detailed databases of bushmeat publications and projects, and provided connections among bushmeat working groups around the globe. We work closely with international NGOs, African governments and our colleagues in numerous U.S. government agencies. We provide resources and contacts to international media for bushmeat related stories including major media sources.

Facilitating Public-private Partnership: Public-private partnerships enable improved regulation of the logging industry. Partnerships have the potential to generate significant conservation payoffs at relatively low cost. Innovative pilot projects are beginning to realize significant conservation payoffs from the greening of private sector business practices. BCTF and its members, particularly the Wildlife Conservation Society (WCS), have stressed the importance of working closely with extractive industries to develop effective wildlife management strategies in concessions. In addition, WCS has encouraged logging companies to enforce existing wildlife laws in areas under their control.

Development of Economic and Protein Alternatives: Revitalizing agricultural production through strategic transportation planning and domestic agricultural research and extension will increase food production and consumer access to substitutes for bushmeat. Alternatives would also provide income-generating options to farmers turned hunters. BCTF has collected information on current efforts to provide economic and protein alternatives.

Organization of Market Seller and Hunter Associations: Development of market seller and hunter associations could be a component of a highly effective bushmeat trade control system. Bushmeat sellers, mostly women, represent potential partners in controlling the amount and types of animals (non-endangered species) sold. BCTF has collected information on the importance of such associations to the bushmeat trade but has made little progress to date on this issue.

Professional Training: With Africa's three regional wildlife colleges and support from USAID and the World Wildlife Fund US, we are currently organizing and conducting a series of workshops intended to develop bushmeat curriculum to be used in training wildlife and protected area managers.

In summary, the BCTF model is showing promise as a new opportunity for addressing critical wildlife conservation issues. The very existence of BCTF has encouraged organizations and governments to view the bushmeat issue in a different light. With the full support of the U.S. government and international partners, we believe it is possible to effectively address the bushmeat crisis.

Recommendations

BCTF makes the following recommendations for U.S. government involvement in seeking solutions to the bushmeat crisis:

1. Recognize that uncontrolled hunting and consumption of wildlife is the most immediate threat to tropical forest biodiversity and that it increases the risk of deadly viral disease outbreaks, and further compromises the livelihood of poor rural families in Africa;
2. Identify a Congressional Bushmeat Caucus to collaborate with NGOs and affected governments on specific mechanisms to address the bushmeat crisis;
3. Encourage Congress to support efforts to improve African natural resource management and develop a system of effective protected areas; and
4. Support Administration efforts to encourage alliances to promote sustainable economic development in Africa through better governance, improved agricultural practices, enhanced public health, and open trade.

We applaud the efforts of Chairman Gilchrest and members of the Subcommittee to raise the profile of this issue, and we are hopeful that this hearing will put in motion a collaborative global effort to address this complex threat to biodiversity conservation and human health.

Included for your reference are fact sheets BCTF has developed on various specific issues related to the bushmeat crisis:

Bushmeat and International Collaboration
Species Affected by the Bushmeat Trade in Africa
Bushmeat and Economic Development
The Role of the Logging Industry
Coltan Mining in the Democratic Republic of Congo and Its Impact on Illegal Bushmeat Hunting
Bushmeat and Global Human Health
Bushmeat and Ecology
Culture and Bushmeat

BCTF Steering Committee 2002-2003

Michael Hutchins, AZA, Co-Chair
David Wilkie, WCS, Co-Chair
Christine Wolf, FFA, Vice-Chair
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Russ Mittermeier, CI
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Kristen Lukas, Cleveland Metroparks Zoo
Anne Warner, Oakland Zoo
Kenneth Cameron, Cincinnati Zoo and Botanical Garden,
Brian A. Rutledge
Tony Mokombo, WWF
Dieter Steklis, DFGFI
Rebecca Hardin, Harvard University,
Tony Rose, Biosynergy Institute
Samuel Fopa, Bushmeat Crisis Discussion Group – Cameroon
J. Bryan Carroll, Bristol Zoo Gardens – UK

BCTF Supporting Members 2002

American Zoo and Aquarium Association
American Society of Primatologists
African Wildlife Foundation
Chicago Zoological Society/ Brookfield Zoo
Cincinnati Zoo and Botanical Garden
Cleveland Metroparks Zoo
Columbus Zoo and Aquarium
Conservation International (CABS)
Dallas Zoo
Detroit Zoological Park
Dian Fossey Gorilla Fund International
Disney Wildlife Conservation Fund
East Bay Zoological Society-Oakland Zoo
Field Museum, The
Fund For Animals, The
Happy Hollow Park & Zoo
Humane Society of the United States
Jane Goodall Institute
Lincoln Park Zoological Gardens
Louisville Zoological Garden
Lowry Park Zoo
Oklahoma City Zoo
Zoological Society of Philadelphia
Saint Louis Zoo
Safari Club International Foundation
San Antonio Zoological Garden and Aquarium
Sedgwick County Zoo
Toronto Zoo
Wildlife Conservation Society
World Wildlife Fund, U.S.
Zoo Atlanta
Zoo New England
Zoological Society of San Diego
Dallas Zoo (Contributing)
Folsom Children's Zoo & Botanical Garden (Contributing)
Conservation and Recycling at the Tulsa Zoo (CARATZ) (Contributing)
Diane A. Ledder Charitable Trust (Contributing)

Bushmeat and International Collaboration

Species Involved: All Bushmeat Species Rodents to Elephants

Stakeholders Involved: Rural Communities, Heads of State, National and International Conservation Organizations, Zoological Parks, Animal Welfare Organizations, Human Welfare Organizations, Tropical Forest Conservation Agencies, Local and National Governments, and International Treaty Organizations

Key Concepts:

- The bushmeat crisis is the most significant immediate threat to the future of wildlife populations in Africa.
- Increased demand resulting from high population growth trends, modernized hunting methods (guns and snares), and road development, all contribute to the growth of the illegal commercial bushmeat trade.
- Tropical forests and other ecosystems are being emptied of their wildlife for this unsustainable trade, which is leading to severe ecological damage and human tragedy.
- Solutions to the bushmeat crisis require international collaboration on: policy reform, sustainable financing, long-term support for protected areas, developing protein and income alternatives, awareness and education campaigns.

Summary:

Approximately 30 million people live within the forested regions of Central Africa, 40–60% live in cities and towns, and most rely on the meat of wildlife as a primary source of animal protein. Forest antelope (duikers), wild species of pig, and primates are most often eaten, and as much as 1 million metric tons of wildlife is killed for food in the region each year. In West African nations human population densities are high (25–78 persons per square kilometer) compared to countries in the Congo Basin (5–20 persons per square kilometer). West African wildlife populations have been so depleted by years of unsustainable hunting for meat, that bushmeat is no longer the most important source of protein in families' diets. When bushmeat is eaten in West Africa, rodents have replaced the over-hunted and now scarce antelopes and primates as the most commonly eaten wild animals. East and Southern Africa are facing a serious decline of many wildlife populations outside of protected areas the bushmeat trade is believed to be largely responsible for this decline with increasing human populations and demand for meat driving the trade.

Background:

Wildlife has been hunted for food ever since humans first evolved, and wildlife is still viewed as a resource 'free' for the taking in many areas. Today in Africa, bushmeat continues to be an economically important food and trade item for thousands of poor rural and urban families. Animal parts are also important for their role in ritual, and bushmeat has become a status symbol for urban elites trying to retain links to 'the village'—often commanding high prices in city restaurants. The immediate loss of wildlife and the secondary loss of many plant species jeopardizes the function and stability of natural habitats—including both forests and savannas threatening the long-term survival of ecosystems and the people dependent upon them.

Current Understanding and Activities:

Hunting of wildlife to meet human demand for protein may still be sustainable in the few remaining areas where population densities are less than 2 people/km2, trade routes are poorly established, and human population growth rates are low. Markets, however, drive the scale of the commercial bushmeat trade now occurring in West and Central Africa, with their large, rapidly growing populations of consumers. This commercial-scale trade threatens the survival of many species, including several unique to the dense forested regions of Africa. Though deforestation has an obvious impact on wildlife dependent on these habitats, over-hunting for the commercial bushmeat trade constitutes a comparable threat to the ecosystem itself. It often results in the Empty Forest Syndrome: a forest filled with trees, but with few if any large animals. Such forests will, over the long term, suffer dramatic changes in structure and composition as the wildlife responsible for dispersing seeds are lost through over hunting. The immediate loss of wildlife and the secondary loss of many plant species jeopardize the function and stability of the forests' complex web of life, threatening the long-term survival of the forests themselves.

Solutions:

Possible solutions include: implementation of wildlife management efforts in logging and mining concessions; maintenance of a network of protected areas; regulation of hunting and trade; increasing consumer access to affordable and palatable protein substitutes; development of alternative income-generating activities; enhancing national and local resource management capacity; and, widespread awareness-raising and education. These actions are all important components of comprehensive action to resolve the unsustainable bushmeat trade. For these steps to be taken, it is essential that conservation organizations, government agencies, donors, and interested individuals collaborate to share information and facilitate action. The Bushmeat Crisis Task Force was formed with these goals in mind.

BCTF Summary:

Founded in 1999, the BCTF is a consortium of conservation organizations and scientists dedicated to the conservation of wildlife populations threatened by commercial hunting of wildlife for sale as meat. The BCTF operates under the direction of an elected Steering Committee and is funded by Supporting and Contributing Members.

BCTF goals are to: a) work with the general members of the BCTF to focus attention on the bushmeat crisis in Africa; b) establish an information database and mechanisms for information sharing regarding the bushmeat issue; c) facilitate engagement of African partners and stakeholders in addressing the bushmeat issue; and d) promote collaborative decision-making, fund-raising and actions among the members and associates of the BCTF.Species Affected by the Bushmeat Trade in

Africa: This is a summary of the major taxonomic groups affected by the bushmeat trade in Africa. For a complete species list please visit the BCTF Website: [http://www.bushmeat.org/html/SpeciesAffected.htm]

ANTELOPE: Duikers (Cephalophus spp.) are one of the primary targets for both subsistence and commercial hunting activities in many regions of Africa. With a limited understanding of duiker life histories in natural habitats and the difficulties of conducting monitoring activities, conservationists are challenged to determine the ecological effects of commercial bushmeat hunting on both duiker populations and the ecosystems in which they live. Current research indicates that duikers typically supply 40–80% of the meat available in bushmeat markets across Central Africa. In West Africa, years of commercial-level exploitation coupled with habitat loss have resulted in considerably reduced duiker populations in many areas. Projections for duiker populations in the long-term suggest dramatically decreasing trends for the majority of species. Addressing the bushmeat trade should involve approaches that include all species effected from rodents to elephants, and should pay particular attention to Africa's duikers as a group of primary importance to both present and future generations of Africans.

ELEPHANTS: African elephants are considered keystone species because of the pivotal role that they play in structuring the plant and animal communities where they reside. The continental decline of the African elephant and the contraction of its range have historically been associated with the ivory trade as well as habitat fragmentation due to human population expansion, and desertification. However, elephants are increasingly targets of the illegal market in bushmeat. Currently the majority of the elephants' range in Africa is outside of protected areas, particularly in Central Africa, where elephants are increasingly vulnerable to human encroachment and illegal hunting. Despite the growing consensus and recognition that elephants are being killed illegally not only for ivory, but also for their meat, there is a lag in the research focus on this issue. Most likely this is because illegal poaching for ivory has overshadowed investigations of the poaching of elephants for bushmeat. It is important to delineate this gap in the bushmeat research knowledge base in order to identify and prioritize critical habitat, threatened elephant populations within these regions, and the still un-asked research questions before it is too late. By defining the gap in the current knowledge conservation organizations will be better able to direct future field research and conservation projects, and to help potential funders of these projects to prioritize and allocate scarce research monies.

PRIMATES: The effects of the bushmeat trade are particularly devastating to primate communities. Primates often become key targets when populations of antelope and other higher-return species become depleted due to over hunting. Currently there are more than 26 species of primates being harvested for the bushmeat trade including all species of great apes. The impacts of the bushmeat trade on primates is well-outlined in the 1998 Ape Alliance bushmeat report, which suggests: both local and complete extinctions of endangered and threatened species, expansion of live trade in apes [aka bushmeat orphans], destruction of subsistence-based human communities [due to loss of their resource base], and increased risk of disease transmission resulting from contact with primates. This final point is beginning to emerge as a significantly important research topic. New studies are identifying an increasing number of potential linkages between emerging infectious diseases and primates through the bushmeat trade, including HIV, Ebola, and others. The impacts of bushmeat hunting on both primate and human communities threatens the future of all primate populations locally and the human population globally.

CARNIVORES: In contrast to their savanna counterparts, carnivores in rainforest habitats are inconspicuous (many are solitary and nocturnal), yet they are numerically important members of forest mammal communities throughout Central and West Africa. African forest carnivores are difficult to census using traditional transect methods and thus ecological information is rudimentary and the status of most species in African forests remains largely unknown. Carnivores are not 'traditional' bushmeat species and are generally captured on an opportunistic basis. When they can afford to be selective, African forest hunters generally prefer duikers and primates. In some locales, however, carnivores are targeted and the trade in carnivore skins (such as leopard) can be significant. Cable snares are notoriously non-selective and carnivores can be caught in such traps. They are better equipped than most mammals to escape by chewing their way out; however, the "collateral mortality" due to injuries incurred is unknown. While all forest carnivores may not be directly threatened by over-hunting, they are likely to be indirectly impacted due to competition with humans for the hunting of their most important prey species.

Impacts of the escalating bushmeat crisis on forest carnivore populations are not known. The extent to which carnivores fall prey to humans is difficult to quantify

or monitor over the long-term because these animals are not highly marketable and are usually consumed rather than sold. Evaluating the selectivity of hunters is impossible without information on the availability (i.e. relative densities) of target species, however, a given number of individuals extracted from an area may have more impact ecologically than other mammal groups because of their naturally low densities, low intrinsic rates of increase, and position on the food chain. Presumably, hunting poses the most serious threat to forest carnivore populations where they are already exposed to the adverse effects of forest fragmentation, such as in the Upper Guinea rainforests, considered a core area for the conservation of small carnivores. The IUCN Small Carnivore Specialist Group listed habitat destruction and hunting as the main threats facing small carnivores.

RODENTS: Due to the difficulty of raising domestic hoof stock in Africa, various sources of wild animal protein, including rodents, have traditionally been used. As rodents are relatively abundant, easy to capture, and are preferred by consumers, they have been proposed by some as a potential alternate source of protein and income through game ranching and micro-livestock domestication. However, other viewpoints hold that rodent farming is an inefficient way to generate protein. Human consumption of rodents does have associated health risks however. In parts of tropical Africa, Lassa fever, an acute viral illness, has become a serious problem in recent decades. The reservoir of the Lassa virus is the multi-mammate rat of the genus Mastomys. Only a few of the 349 African rodent species appear with regularity in the commercial bushmeat trade with the most commonly hunted rodent species including grasscutters or cane rats (Thryonomys swinderianus and T. gregorianus), giant pouched rats (Cricetomys gambianus and C. emini) and porcupines (Atherurus africaphus ssp). But while the range of rodent species directly affected by the bushmeat trade is not great, the numbers of animals consumed can be considerable. The species that have been documented by bushmeat market studies tend to be among the most abundant, as they are easier to locate and capture, and because ungulates, such as duikers, are still plentiful enough to make up the bulk of the bushmeat trade affording hunters more meat for their efforts than most rodents. However in some cases rodent species have been locally exterminated as in the case of the giant pouched rat in eastern Democratic Republic of Congo (DRC), where the human population is dense, the land fully cultivated, and other wildlife species overhunted. Similarly, some populations of grasscutter rats are well below carrying capacity, or have become extinct due to local overexploitation (NRC 1991). Most African governments have laws requiring that hunters have a license to take unprotected rodents. These types of measures could help to protect rodent species from overhunting, but are infrequently enforced (IUCN 1996).

Bushmeat and Economic Development

Bushmeat Focal Issue: Eco–Economics
Species Involved: Rodents to Elephants
Stakeholders Involved: Rural Communities, Urban Communities, Hunters,
Traders, Market Sellers, Logging Companies, Development Agencies and Donors

Key Concepts

1. Lack of economic options and the value of bushmeat relative to its production and transportation costs make participation in the commercial bushmeat trade attractive to poor rural and urban people. Moreover, profits from the bushmeat trade attract non-local, commercial hunters who are less likely to practice restraint when hunting.

2. In Africa, as in much of the rest of the world, growing urban populations and rising household incomes drive the increasing demand for meat. With wildlife "free for the taking," and inadequate production and marketing of alternative protein sources, bushmeat will continue to fill this growing consumer demand for meat.

3. Most people eat bushmeat because it is the cheapest and most readily available source of meat. Some are willing to use scarce financial resources to eat a bushmeat meal. In other parts of the world people shift away from eating bushmeat as soon as other sources of protein become both reliably available and cheaper.

Summary

Economics drives the bushmeat crisis, although cultural attachment may also play a role. Growing demand for meat in most cities provides new economic opportunities for people whose traditional sources of income have withered as agricultural prices have fallen and jobs have become increasingly scarce. Although wealthier people will pay high prices for gorilla, snake, and porcupine in the capital cities, most bushmeat is eaten by families who cannot afford the more costly beef, chicken and pork. Economics can also be a key component to developing solutions to the bushmeat crisis. Cooperative efforts could help to increase law enforcement and to

tax commercial trade in wildlife will contribute to solving the bushmeat crisis. Such activities would reduce the supply and increase the price of bushmeat. This would encourage consumers to seek alternatives, and thus help protect wildlife populations. Local production of economically affordable alternatives is vital, but may need to be subsidized initially to encourage production and keep alternative protein prices significantly lower than bushmeat. Reducing supply and shifting demand to locally produced alternatives are the keys to curbing the commercial trade in bushmeat without jeopardizing the health and welfare of Central Africans.

Background

Evidence from other parts of the world suggests that poor families initially consume more bushmeat as their incomes rise. Consumption only begins to drop when families become wealthy enough to switch to eating more expensive cultivated sources of protein. Bushmeat consumption, therefore, appears to follow an inverted U pattern with income. If this pattern is also true for Central and West Africa, then changes in livelihoods of rural and urban families may increase or decrease consumption of bushmeat, depending on where they are on the income axis.

Though people have eaten bushmeat on a subsistence basis for millennia, only recently has it become such an important source of income for so many people. In rural areas, people once made money growing and selling a variety of products, including: rice, cotton, cacao, coffee and peanuts. Over the past 20 years livelihoods have collapsed as infrastructures have decayed, prices fluctuated and the currency devalued. With farming unprofitable and limited off-farm jobs available, many rural people have turned to commercial hunting and trading of bushmeat. This is an attractive alternative because high returns can be made from a relatively small investment, there are only limited controls on hunting and trading of bushmeat, and logging companies provide hunters with access to once isolated regions of the forest, and traders with the means to transport bushmeat to markets. Urban populations fuel the demand for bushmeat. These communities have grown substantially since the 1960s and their buying power has fluctuated with the unstable economy. Bushmeat is meeting urban demand for meat because it is relatively cheap and available, particularly since logging roads and vehicles have increased hunters' access to once isolated forests and their wildlife populations.

Current Understanding and Activities

Central Africans typically eat as much meat as many Europeans and North Americans (30–70 kg/person/year). Most of this meat comes from wildlife. Approximately 30 million people live in the forests of Central Africa, and they eat an estimated total of 1.1 million metric tons of wildlife each year the equivalent of almost 4 million cattle. The estimated annual value of this bushmeat trade in West and Central Africa could exceed 1 billion U.S. dollars. A hunter can make $300–1000 per year from commercial hunting. This is more than the average annual household income for the region and is comparable to the salaries of those responsible for controlling the bushmeat trade. Hunters regularly reinvest their profits on improved technologies, which makes killing wildlife easier, more profitable, and less sustainable. The difference between subsistence and commercial hunting are becoming less clear as marketing opportunities increase. Traders, transporters, market sellers, restaurateurs, and their families also benefit from the commercial trade in bushmeat and we must recognize that all of their incomes would be affected if laws against the trade were strictly enforced. As demand for bushmeat increases, more people will be encouraged to become involved in the trade, increasing the pressure on wildlife populations, threatening the survival of rare species, and jeopardizing future access to ecological, nutritional and income benefits from wildlife. A few pilot projects have begun in West and Central Africa to assess the extent and impacts of the bushmeat trade, to place controls on the commercial bushmeat trade, and to develop alternative sources of protein. Widespread collaborative efforts are necessary to develop and implement bushmeat control and wildlife management activities and to share the lessons learned from such activities.

Recommended Solutions

Efforts to constrain the supply of bushmeat and enforce laws that prohibit the commercial trade in bushmeat will, in the short-term, decrease the amount of bushmeat available in markets. However, if demand for bushmeat is strong and substitutes do not exist, bushmeat prices will likely increase, providing incentives for people to enter the trade and find ways to circumvent controls. Consequently, solutions to the bushmeat crisis must include ensuring that consumers have access to alternative protein sources that are both palatable and priced competitively with bushmeat. Unless consumers have economically viable alternatives they will con-

tinue, not surprisingly, to demand wildlife as an affordable and tasty source of meat.

The Role of the Logging Industry

Species Involved: All Flora and Fauna—Entire Ecosystem

Stakeholders Involved: Local communities, international timber producers, timber product traders and consumers, producer and consumer country governments, World Bank, Multilateral Development Banks, International Monetary Fund, Food and Agriculture Organization (FAO), African Timber Organization, International Tropical Timber Organization (ITTO)

Key Concepts:

- After oil and minerals, logging typically provides the next most significant source of national revenue for the densely forested countries of West and Central Africa, and will continue to do so for at least the next 25–50 years.
- Road construction associated with selective logging dramatically increases hunter access to isolated sectors of the forest, and decreases the cost of transporting bushmeat to urban markets, effectively increasing the supply to, and profitability of the bushmeat trade.
- Per capita bushmeat consumption is highest in logging concessions, because the large numbers of company workers can afford to eat more meat than poorer unemployed families, they have the money to purchase guns and ammunition, and they have motorized access to the forest to hunt.
- Logging companies are the de facto managers of most of the remaining relatively intact blocks of forest outside of protected areas and have a key role to play in ensuring that logging practices do not jeopardize the survival of wildlife populations within concessions.
- Public advocacy has encouraged several logging companies to partner with conservation organizations. Such companies are developing and testing approaches to curb the export of bushmeat from concessions and to decrease bushmeat consumption by loggers and their families.

Summary

Logging is an economically important land-use throughout West and Central Africa, and a major threat to wildlife. Present selective logging practices not only result in increased consumption of bushmeat within concession areas, but also facilitate the supply of bushmeat to urban markets and enhance the profitability of the trade. With assistance from governments and conservation NGOs, logging companies are beginning to alter their practices so that they no longer directly or indirectly promote the unsustainable consumption of bushmeat, thereby minimizing the impact of logging on forest wildlife. Widespread adoption and enforcement of appropriate forest and wildlife management policies and practices is essential to effective control of the commercial bushmeat trade.

Background

The tropical forests of West and Central Africa cover an area of over 2 million km2 almost four times the size of France. Although as many as 80 species of trees are logged commercially in these regions, less than 5 account for the majority of wood exports. In Cameroon, Sapelli (Entandrophragma cylindricum) and Ayous (Triplochiton scleroxylon) comprise over 1/3rd of all log exports. In Gabon, Okoumé (Aucoumea klaineana) accounts for over 70% of exports. Logging progresses like a wave over the landscape as timber companies enter into unlogged areas in search of the few valuable trees that are scattered in low density throughout the forest. Once these are logged the company quickly moves on to the next area. To find and harvest these individual trees, loggers must construct numerous survey trails and roads. This road-building both heavily fragments the forest, and opens it up to hunters. A hunting trip that might have taken days to complete before the arrival of logging may be reduced to a few hours when the hunter can hitch a ride on a logging vehicle. Moreover, with the help of the logging company transport, hunters no longer have to carry the dead animal(s) for long distances and therefore tend to kill many more animals on each trip. Logging companies not only directly increase demand for meat by hiring a large workforce, they also greatly facilitate their workers entry into the commercial trade to supply bushmeat to urban markets. This same scenario existed in West Africa in the 1950s and 1960s, and contributed to the widespread and dramatic declines in wildlife populations evidenced in West African forests today.

Current Understanding and Activities

Decades of research and subsidies have convincingly demonstrated that natural forest management for timber is both economically and ecologically untenable. Yet, it may be possible to manage timber harvesting to generate a relatively constant, and economically viable stream of marketable wood, accepting that tree species composition will change within the logged forest, but ensuring that logging practices do not result in significant impacts on wildlife populations. The majority of large, relatively intact blocks of forest outside of protected areas, that comprise less than 6% of the landscape in Central Africa, are currently being logged or are earmarked for logging. It is critical that logging companies modify their practices to minimize the impact on wildlife, and that protected areas are provided with funding sufficient to ensure the long-term persistence of forest plants and animals. The role of protected areas in conserving forest biodiversity is particularly important in West Africa where less than 8% of the post–Pleistocene forest remains, and protected areas constitute the last bastions for forest dependent species. Advocacy and media attention at the international level recently has encouraged several multinational logging companies to develop partnerships with conservation NGOs to design and implement pilot activities to curb the flow of bushmeat from concessions, and to provide logging company workers and their families with alternatives to bushmeat. Governments and donors are also working with trade associations to develop a 'code of good conduct' for all logging companies active in the region.

Recommended Solutions:

Logging companies provide revenues and employment essential to the economies of West and Central Africa, and have a major role to play in determining the future state of forests and wildlife management in the region. Providing logging companies with incentives to minimize impacts on plant and animal communities within concessions, to establish long-term wildlife management plans, to set aside unlogged refuges for rare or threatened species, to halt the transportation of hunters and bushmeat on logging vehicles, to deny hunters road access to logged forests, and to seek ways to provide company employees with alternative sources of protein, are all important steps in mitigating the adverse impacts of logging on wildlife.

Coltan mining in the Democratic Republic of Congo and its impact on illegal bushmeat hunting

- Tantalum is a rare, valuable, metallic element which is twice as dense as steel and highly resistant to heat and corrosion. It can store and slowly release an electrical charge, a property that has made it a vital material for capacitors in portable electronic equipment including laptops, digital cameras, playstations and mobile phones. Other applications include surgical equipment, turbine blades for jet engines and lining chemical reactors.
- It is mined in several countries with Australia responsible for over 60% of world production. All of the production of the largest mines is sold, in advance, on fixed price contracts to key tantalum processors. There is no central market for tantalum and, other than the major mine-processor contracts, prices are determined by dealers on an individual transaction basis.
- In 2000, increased anticipated demand for electronic products caused a tantalum supply shortfall, precipitating a rush of panic buying and a massive price increase. In the Democratic Republic of Congo (DRC) this became a Klondike-style rush into the World Heritage Site National Parks where 'coltan', a tantalum-bearing gravel ore, can be easily surface-mined with shovels and sieves. The mines are in rebel-held areas of the war-torn, impoverished DRC where warring factions are responsible for humanitarian atrocities and neighboring countries are accused of perpetuating the war as a cover for systematic exploitation of minerals.
- The mining camps had a massive impact on local wildlife through commercial hunting for food, including the wholesale killing of endangered species such as the eastern lowland or Grauer's gorilla. This species occurs only in DRC and it is estimated that over 85% of the world's population occurred in Kahuzi Biega National Park prior to the arrival of 10,000 miners and 300 professional hunters. The population has likely been decimated.
- The United Nations Security Council published two reports in 2001 which clearly stated that the private sector must accept some responsibility for contributing to this resource-based conflict through the purchase of illegally mined material the spoils of war
- The panic-buying coltan boom was followed by a tantalum market slump in 2001. The plummeting prices were not, as widely reported, due to international pressure to boycott Congolese coltan nor to the development of alternatives to

tantalum, but rather due to companies working off their expensive inventories they simply didn't need to buy it. Despite significant planned expansions of Australian mining capacity, demand for tantalum is likely to continue to grow at a steady rate that may again outstrip supply. Hence, sources such as DRC will remain strategically important.

- There has been international call for companies to boycott Central African tantalum, which is the easiest and safest corporate option, particularly in terms of public relations. There is no need to purchase Congolese coltan at present due to large inventories still being used up after the panic-buying phase. However, due to smuggling and the nature of the world market, it is almost impossible to guarantee that shipments of ore purchased on the 'spot' market are free of this 'conflict coltan'. Sanctions may impact negatively on the poverty stricken region, which is so desperately in need of investment and may in fact increase dependence on bushmeat.
- Food security for the Congolese people has been profoundly compromised by the long-standing conflict that has ravaged the country. Theft and destruction of crops and livestock has combined with voluntary and forced desertion of agriculture for more lucrative mining operations, and thereby to create growing dependence on food aid and imports. Under such conditions of stress, dependence on bushmeat has increased with sustainable wild harvest off-take hugely exceeded by the desperate population.
- A regulated, Congolese, coltan industry based on long-term, transparently negotiated business arrangements with legitimate Congolese coltan producers, under the terms of the DRC peace process, should be explored. Payment of a fair market price for an ethically sourced product could contribute significantly to the peace process in the region, as business intervention may be a viable route to stability in a conflict that is predicated on economics. This option is far more complex, not least as it raises significant questions about the acceptability and risk of doing business in a war zone. Paradoxically, however, this route could demonstrate greater environmental and social responsibility.
- Fauna & Flora International (FFI) is global conservation organization that builds the capacity of partner organizations to find sustainable and innovative solutions to conservation issues in some of the most politically complex and most important reservoirs of biodiversity in the world. FFI is working with tantalum consuming industries to identify their role and responsibilities with regard to management of the coltan supply chain, and to find economically, politically, socially and environmentally viable solutions to the crisis.
- FFI is working with corporations and industry bodies, governments, conservation organizations, humanitarian NGOs and aid agencies, inter-governmental bodies and financial institutions to identify possible routes in which coltan can generate long term benefits to DRC rather than fueling a war which has resulted in over 3m 'excess deaths' in 3 years.

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Bushmeat and Global Human Health

Species Involved: Non-human Primates, Humans, Potential other vector/reservoir species.

Stakeholders Involved: Rural and urban communities in Africa, World Population, Centers for Disease Control, National Institutes of Health (USA), University and Government Health Researchers around the Globe, Private Companies engaging in extractive and/or construction-transport activity in tropical forest areas,

Key Concepts:

- Wildlife, particularly primates, harbor diseases that can jump to humans and cause new and typically lethal diseases such as AIDS and Ebola
- Hunting, butchering, and consumption of bushmeat places people at increased risk of contracting virulent animal borne diseases
- Logging, Mining, and Hydroelectric or Fossil Fuel Transport projects have opened up new areas of forest to commercial hunting, increasing the risk that humans will be exposed to new animal borne diseases
- Bushmeat is an important source of dietary protein for most Central Africans, and they are unlikely to stop eating bushmeat unless they fully understand the

risks to their health, and to the continued presence of these animal populations, and possibly unless other cheaper substitutes are available
- Increasing our understanding of the factors likely to promote transmission of diseases from wildlife to humans is critical to evaluating the public health risks associated with the commercial trade in bushmeat
- Capacity building at local, national, and international levels for disease monitoring, surveillance, and care provision among forest populations not only provides better information in the medium to long term, but also valorizes local knowledge, provides educational opportunities, and offers economic alternatives to commercial hunting for forest populations in the immediate term.

Summary:

Though bushmeat is often cited as essential to meeting the basic nutritional needs of rural African communities, studies are beginning to indicate considerable negative health implications connected with the processing and consumption of wildlife. Reports are beginning to emerge connecting non-human primates with Ebola virus in a variety of African outbreak sites. Deaths have also resulted from outbreaks of diarrhea linked with the consumption of bushmeat. Evidence of simian immunodeficiency virus (SIV) infection has been reported for 26 different species of African non-human primates, many of which are regularly hunted and sold as bushmeat. Two of these viruses, SIVcpz from chimpanzees and SIVsm from sooty mangabeys, are the original cause of AIDS in humans. Together, they have been transmitted to humans on at least seven occasions. New research suggests that HIV recombinants are also appearing in forest sites where commercial hunting and in-migration of human populations has affected the distribution and circulation of viruses. This has scientific as well as public health implications, locally and globally.

Background:

Emerging infectious diseases are a major threat to global human health. While dramatic outbreaks of Ebola virus or Sin Nombre (hanta) virus have attracted widespread media attention, the disease with the greatest global impact to have emerged recently is the acquired immunodeficiency syndrome (AIDS). First recognized in 1981, AIDS represents the endstage of infection with one of two lentiviruses (human immunodeficiency virus types 1 or 2) of zoonotic origin. HIV–1 has spread to most parts of the world, while HIV–2 has remained largely restricted to West Africa. On a global scale, HIV/AIDS represents the most important public health threat of the new millennium. These recent research results emerge at a time when human populations are increasing while availability of resources to meet basic nutritional needs are decreasing. Finding ways to reduce human health threats potentially caused by the bushmeat trade while addressing protein needs for millions of people is a global imperative. Bushmeat in Central Africa constitutes 80% of all meat consumed and provides poor rural and urban families with as much as 50% of daily protein requirements. Forest antelope (duikers) are the most popular species to hunt because they are relatively large and abundant, and are easily trapped at little cost using wire snares. As antelope numbers decline, hunters shift to primates, which are easy but more expensive to hunt, as each animal costs a shotgun shell. Eventually, as all large animals are depleted, people resort to hunting and selling rodents. Given the greater genetic proximity of apes and monkeys to humans, people are most at risk of contracting animal borne diseases when bushmeat markets have a high ratio of primates.

Current Understanding and Activities:

Commercial logging of tropical forests represents an important economic activity for several African countries. Logging operations facilitate the intensification of commercial hunting by building roads into once relatively inaccessible areas of forest with abundant wildlife, and by allowing hunters to travel on logging vehicles and to transport their bushmeat to urban markets. This increased penetration of tropical forest has the potential to increase human exposure to new infectious agents. In west central Africa alone, numerous primate species known to harbor SIV, including colobus, sun-tailed and DeBrazza monkeys as well as mandrills, drills, chimpanzees, and red-capped mangabeys, are regularly hunted and sold at local bushmeat markets. Certain of the simian viruses have properties that render them at least candidates for natural transmission. Thus, although there is no evidence that zoonotic transmissions have occurred as a direct result of this commercialized bushmeat trade, the potential for human exposure has increased, as have the conditions that might support the emergence of new zoonotic infections. A number of studies are currently being undertaken to investigate the linkages between wildlife diseases and human health. Such research is essential in addressing many important questions concerning wildlife human interactions. Equally important are projects to explore al-

ternative models for economic development that do not entail large scale ecological disturbance, and to develop and test approaches to meeting Central Africans' basic nutritional and protein needs, whilst shifting consumer preferences away from eating bushmeat.

The events that brought about the HIV–1 pandemic may never be fully elucidated, though their connection to emergence mechanisms for other pathogens, such as Ebola or Hepatitis, merits serious attention. Recent research suggests that initial emergence of SIV into human populations as HIV–1occurred during the first wave of extractive activity in African forests, during the rubber boom of the 1920s and 1930s. Regardless of what ultimately caused its explosive spread, conditions that promote and sustain zoonotic disease emergence have likely increased rather than decreased in the past two decades. Studies underway seek to confirm and track continued transmission of SIVs to humans at present, and to determine the prevalence of infection and associated risk factors. Researchers are also developing and testing diagnostic assays capable of recognizing a wide range of lentiviral infections in both humans and primates, including the development and application of non-invasive approaches to screen primate populations in the wild for evidence of SIV infection. Related work trains local forest residents to monitor and report on the health of gorillas and other non-human primates, and has been instrumental in documenting and responding to recent Ebola outbreaks. Addressing the origins and future of HIV and other pathogens entails attention to the convergence of issues such as environmental change, conservation of endangered primate species, economic development, public health, environmental governance, and corporate environmental leadership. Such work will increasingly require interdisciplinary collaboration of scientists with expertise in anthropology, history, ecology, political science, economics, primatology, epidemiology, virology and conservation biology. It will demand an emphasis on infrastructure development and training in the areas concerned, sensitivity to feelings of stigma, and respect for distinct culturally based attitudes to some of these issues. It will foster discussions concerning resource allocations based on scientific and public health priorities as well as the changing definitions and perpetual demands of economic development.

Recommended Solutions:

An interdisciplinary working group of international researchers studying emergent viral disease in tropical forest sites all over the world met under the auspices of the International Society for Ecosystem Health in June, 2002 in Washington D.C.; they will meet again at Harvard University, under the auspices of the Harvard Academy for International and Area Studies, and the Harvard AIDS Institute, in November 2002 (for more information, write rhardin@wcfia.harvard.edu). During the final roundtable session in June, with representatives from Department of State, Department of Interior, Department of Agriculture, and other government agencies as well as non-governmental organizations, the following recommendations emerged:

Governments and donors:

1. Recognize that previous distinctions between domestic and international health concerns are no longer necessarily accurate; Pathogens in a tropical forest today could eventually reach Arizona or Michigan.

Example: HIV history, above.

Recommendation: Institute internal training modules for government agencies and policy makers, demonstrating and discussing links between human health, ecosystem health, good governance, strong economic performance, stability, and U.S. national interests/security concerns.

2. Consider a Relative Risk Framework: Place known risks (spread of existing HIV strains, emergence of new HIV strains, and spread of Ebola) on a continuum from high to low risk. Examples: Such an approach has worked well for Food Safety in North America. Recommendations: In the processes that make up the bushmeat trade (opening of forest areas, in-migration, meat demand, market development, hunting intensification, ecological change, market response, etc.) determine via hazard analysis where are critical control points. Identify the risk reduction points and develop a plan and standards for each point. Research can inform that process, creating better management programs and training programs.

3. Build better funding support for multidisciplinary research initiatives with explicit health and ecology focus.

Examples: recent NIH initiatives under Fogarty auspices, and others just taking shape.

Recommendations: strong research protocols protecting animal and human health, and encouraging teams to share and archive their samples; engage in old-fashioned,

omnivorous survey work with open minds to identify not only known but also as yet unknown pathogens.

4. Foster participation in training opportunities at research and health career levels.

Examples: WCS training for local residents in Africa on Primate Health, supported by USFWS; training for international researchers at the Biology of Disease Vectors Program, Colorado State University, supported by MacArthur Foundation.

Recommendation: Earmark funds for local capacity building in any conservation or environmental protection initiative; create and/or strengthen scholarship and fellowship initiatives in these fields for international research training.

5. Senior Government leadership is needed in multilateral negotiations and recently advancing initiatives related to forests and trade where the U.S. has interest.

Examples: We are entering a new institutional era on forest management: CBD has adopted a forest action program; G8 interest; Rio + 10 with clear forest-related deliverables.

Recommendation: While no one institution or organization has total control over such issues as cross sectoral collaboration for sustainable forest management, the U.S. can and should be aggressive on public-private partnerships, as those emerging in Congo basin countries.

6. Ensure the viability and perpetuity of protected areas in tropical forests.

Examples: slow building of a transborder initiative in the western Congo basin, where core areas are surrounded by public/private and trinational government efforts at joint management of mixed-use zones. Recent research suggests that core protected areas, more than buffer zones or management areas, are the best chance for continued densities of forest fauna, with viable population numbers, while experiments in effective management play themselves out in adjoining areas. As wildlife repositories, such core areas have clear value for the education of international publics as well as local residents.

Recommendation: Maintain or increase funding levels for establishment and management of protected areas. Earmark funds for capacity building programs in core areas that value and reward local forest and health knowledge, while expanding skills bases and providing new economic opportunities in research, tourism, and health related fields for local residents.

Private sector:

1. Identify appropriate protein alternatives to bushmeat and mechanisms for making these resources available and affordable to rural and urban communities.

Example: recent trials with imported chicken and fish in Cameroonian logging concessions.

Recommendation: exploring protein alternatives must be done with an eye open for the introduction of new pathogens to wildlife communities via the domesticated animals introduced. However, care in the distribution and marketing of alternatives can reduce such risks, while also reducing consumption of wild animals.

2. Integrate research-based monitoring of disease processes into development projects and for-profit activities in tropical forests.

Examples: PRESICA project in Cameroon, working with logging companies and local populations to conduct blood tests of humans and wildlife in logged areas, while increasing awareness and dialogue about SIV/HIV among stakeholders; Brazilian example of Power Company funding pre- and post- dam construction monitoring of arbovirus levels, and offering treatment to local populations where levels have increased.

Recommendation: Partner with existing research projects, or create an internal agency/service for research and monitoring, focusing on links between human health and the bushmeat trade including mechanisms of disease transmission, monitoring prevalence patterns, and documenting and supporting human nutritional needs.

Environmental NGOs:

1. Work to develop health indicators, for use across ecosystems.

Example: Biodiversity indicators exist at various degrees of specificity. How is that addressed and how we can combine the health with the biodiversity? Also, robust (non-normative) indicators/criteria are being implemented since the September 11 scare, in various sites around the world.

Recommendation: Use current WCS wildlife health program as a model, or starting point. Also, return to original Hotspots Monitoring plan for Conservation International: biomedical issues were a part of the plan. Let us pick those aspects up; work with medical and public health resources in hotspots, and try to systematize our information gathering and training on these topics.

2. Develop awareness raising activities, at various levels.

Example: The Bushmeat Crisis Task Force has effectively generated interest in U.S. based zoo-going publics, and in the North American media. Project PRESICA is developing and testing brochures and other educational materials in Cameroon. Conservation International is doing awareness raising work in Ghana.

Recommendation: weak spots on such work include reaching the outer edges of the stakeholder spectrum: local residents of tropical forest areas, and corporate leaders at the international level. Bolster funding and collaboration across organizations on effective awareness raising at these levels, learning from the successful experiences mentioned above.

Bushmeat and Ecology

Bushmeat Focal Issue: Ecological Processes and Bushmeat

Species Involved: Seed-dispersing animals, including duikers, monkeys, apes and elephants

Stakeholders Involved: Rural Communities, Hunters, Traders, Protected Area Managers, Logging Companies, Development Agencies and Donors, Future Generations

Key Concepts:

- Hunting Wildlife for meat is a greater immediate threat to biodiversity conservation than is deforestation.
- People in the Congo Basin eat as much meat as do Europeans and Americans; 60%–80% of animal protein is derived from wildlife. As much as 1 million metric tons of bushmeat is eaten each year in the Congo Basin.
- Primates and antelopes that are commonly hunted for meat, play an important role in the forest by spreading the seeds of trees, vines and shrubs.
- Forest wildlife productivity is very low compared to savanna populations and cannot sustainably supply protein demands for growing human populations in West and Central Africa.
- Legitimizing and helping countries enforce existing wildlife laws is central to effective wildlife conservation.
- Securing long-term support for protected areas and buffer zones will be the only solution for many species' survival.
- A significant percentage of the animals being hunted are classified as threatened or endangered and are protected by international laws (e.g. CITES).

Summary

Though deforestation and habitat loss is often cited as the primary cause of local wildlife extinction, hunting for both local consumption and large commercial markets has become the most immediate factor that threatens the future of wildlife in the Congo Basin in the next 5–15 years and has already resulted in widespread local extinctions throughout the Upper Guinea Forest Ecosystem of West Africa. Empty Forest Syndrome describes a forest that has been emptied of its wildlife structurally, it appears normal, but no large-bodied animals are present. As wildlife are being hunted out of forests, those ecosystems lose important seed dispersers, thus affecting the ecology of the entire ecosystem.

The short-term economic benefits derived from the commercial bushmeat trade, though expedient for poor families today, may jeopardize long-term economic opportunities for future generations. And worse may place people in increased jeopardy of contracting and transmitting animal-derived diseases such as Ebola or HIV (See BCTF Fact Sheet on Health).

Background

If only one species of animal existed in the forest, hunters would continue to hunt that species until it became so scarce, from over hunting, that profits from hunting declined below that which the hunter could make doing something else, such as farming or fishing. Unfortunately for rare and endangered species, the forests of West and Central Africa are home to numerous wildlife species that are hunted for food. In this case, when hunters go hunting they are not targeting single species, but are roaming the forest in search of any animal worth (in economic terms) killing. A bushmeat hunter with a shotgun is inclined to shoot the largest animal he can be assured of killing because this will generate the most profit per cartridge. So although an animal may become scarce, even to the point of almost going locally extinct, a hunter will shoot it if he encounters it, and it is large enough to warrant using up an expensive shotgun cartridge. Given this fact, rare and endangered species are likely to be driven to extinction by hunters when other more abundant animals continue to make hunting profitable.

Moreover, even when over hunting and bushmeat scarcity causes prices to rise and substitutes to be more competitive, hunting will continue in areas where

bushmeat capture and transport costs remain comparable to the costs of livestock rearing.

Bushmeat is often a primary source of protein for local communities, as other alternatives are frequently not viable. In Central Africa, domestic animals such as cattle, goats, pigs, chickens and ducks are raised by rural and urban households, but they are primarily viewed as savings and insurance rather than as sources of protein. This traditional value of livestock remains important to households in the region today because inflation is high and access to banks and formal credit is limited or absent. Furthermore, tsetse flies and trypanosomiasis severely limit cattle raising in the forested and scrubby savannah landscapes typical of the region. As a result, the meat of domestic livestock tends only to appear in rural or urban markets that are located relatively close to savannahs and ethnic groups with a tradition of pastoralism.

Current Understanding and Activities

Hunting of wildlife to meet people's demand for protein may still be sustainable in the few remaining areas where population densities are less than 2 people/km2, trade routes are poorly established, and human population growth rates are low or negative. The scale of the commercial bushmeat trade now occurring in West and Central Africa, however, is driven by markets with high human densities and growth rates. This industrial-level market threatens the survival of many species, including several unique to the dense forested regions of Africa. While deforestation is an obvious menace to wildlife dependent on these habitats, hunting constitutes an even greater threat to the ecosystem. Even where tree cover is relatively intact, we find forests without wildlife this is known as Empty Forest Syndrome. Such forests suffer dramatic effects in structure and composition as the wildlife necessary to disperse seeds and enable regeneration are gone. This may result in loss of many plant species as well as considerable effects on water flow, including streams and major rivers.

Loss of wildlife from hunting, means loss of seed dispersing animals that play a key role in determining tree composition and distribution, altering both the structure and function of the forest and potentially causing irreversible ecological effects (e.g., carbon sequestration) with global consequences.

Wildlife populations, though highly diverse in these forests, are not as productive when compared with savanna-based wildlife populations. In general, there is an order of magnitude difference between the biomass available for hunting within the same amount of space when we compare forests (2,500 kg per square kilometer) and savannas (25,000 kilograms per square kilometer) (Robinson and Bennett 2000). Thus, animal husbandry programs such as the game ranching efforts (commercial management of wildlife for meat and skins) found in East and Southern Africa are not a viable alternative in West and Central Africa.

Recommended Solutions

- Long-term support for protected areas including provision of well-equipped and trained anti-poaching units is a clear priority for mitigating the commercial bushmeat trade. This is particularly true for West Africa where much of the original forest cover has been removed and protected areas provide some of the only land available for many wildlife populations.
- Target extractive industries to manage wildlife resources in partnership with governments and conservation NGOs.
- Increase support for national and transborder protected area networks and for developing wildlife management capacity at local, national, and regional levels.
- Provide support for stabilization of conflicts throughout the region an important link with dramatic losses of wildlife that removes potential economic development and ecological importance from future generations of Africans.
- Support environmentally sound economic development throughout West Africa and the Congo Basin. Influence broader environmental strategy implementation (e.g. through National Bushmeat Action Plans) and increase capacity for international cooperative efforts.
- Development of multi-level research and education programs including: fundamental and applied research to increase understanding of tropical forest ecosystems; to improve methods for harnessing sustainable, renewable natural resources; to develop alternative sources of income and protein; to adapt school and university curricula to include an improved understanding of biodiversity; to introduce new technology such as interpretation of satellite imagery, communications and tools such as GIS and molecular biology.
- Support public awareness campaigns designed to reach out to range states to raise awareness of the bushmeat crisis and their role in implementing solutions.

Culture and Bushmeat

Bushmeat Focus Issue: Social Ecology

Species Involved: All bushmeat species: rodents, giant pangolins, brush-tailed porcupine, duikers (forest antelope), monkeys, chimpanzees, gorillas, elephants, and humans

Stakeholders Involved: Rural and urban communities, indigenous groups, conservation and development organizations

Key Concepts:

- Bushmeat is an important source of protein for poor rural and urban families in West and Central Africa.
- Many communities will continue to hunt even where alternatives exist as bushmeat and hunting are culturally and socially important.
- When people do not have stable land tenure or livelihood security, they are less likely to care for the resources in the areas where they reside.
- Population growth has a major effect on the demand for bushmeat. Even if per capita consumption remains stable, increasing population can have a devastating effect on wildlife and natural resources. More land must be cleared for housing and agriculture, and more forest resources must be extracted to meet basic needs.

Summary

Local communities are inextricably tied to the current bushmeat crisis in West and Central Africa. They form the network of hunters, traders, truck drivers, market-resellers, restaurateurs and consumers that moves wildlife from the forest to the urban cooking pot. All participants in their trade network rely on bushmeat for some of their livelihoods. Wildlife provides protein, cultural and religious linkages, and a source of income many rural families. People do not typically view bushmeat hunting as a problem. Rather, wildlife is viewed more as crop pests, threats to their lives and livelihoods, an inexhaustible resource free for the taking, and a new source of income. However, growing human population and changing economic conditions are driving demand for bushmeat that now exceeds the rate that hunted wildlife are replaced within the forest. Unsustainable hunting for meat will mean the loss of a valuable source of food and income for the huge number of families involved in bushmeat trade networks. Finding ways to conserve threatened and endangered wildlife species, without compromising the health and welfare of poor rural and urban families is a challenge. Shifting demand to locally produced alternatives to bushmeat and revitalizing the traditional agricultural economies of recent entrants into the bushmeat trade, are the keys to curbing the commercial trade in bushmeat without jeopardizing the health and security of West and Central Africans.

Background

Wildlife species have held great importance for forest-dwelling peoples for millennia. Duikers (forest antelopes), monkeys, rodents and bushpigs all serve human communities as sources of protein, cultural and social artifacts and now, as sources of cash when sold to bushmeat markets. Hunting is vital to communities without access to agricultural markets, or to those who are too poor to purchase other sources of meat. Hunting is inextricably woven into many societies. Animal parts, such as horns, feathers or bones are a crucial part of many cultural and religious ceremonies. In areas where people live at low densities and can rotate their usage of forest resources, wildlife populations do not seem to suffer much damage. However, increasing population densities and unstable land tenure risks depleting the wildlife upon which many communities depend for their way-of-life and cultural identity. Halting unsustainable hunting and helping to retain the cultural value of wildlife is a challenge when many people involved in the commercial trade in bushmeat view wildlife as abundant, inexhaustible, and free to be used.

Current Understanding and Activities

Livelihood insecurity, and absence of land tenure facilitate the unsustainable commercial trade of bushmeat. Poor people with few job opportunities see hunting or trading or re-selling bushmeat as a source of income to meet today's critical needs, and, not surprisingly, are less concerned that their actions risk forfeiting their livelihood in the future. Similarly, families without the legal or practical ability to restrict who hunts how much in their forest, are encouraged to hunt all the wildlife they can as quickly as possible, before others do.

Conservation and development organizations (both governmental and nongovernmental) must tread carefully when working with local people on the bushmeat issue. All of us resent "outsiders" imposing restrictions on our behavior that seem artificial and unconnected to our personal situations, needs and realities. Building relation-

ships and capacity among all key stakeholder groups enables the development of appropriate solutions that can link resource use regulations and activities that offer alternative sources of protein and economic opportunities.

Recommended Solutions

Working with all participants in the commercial bushmeat trade to increase livelihood and resource access security will increase the success of any projects that seek to decrease the quantity of wildlife hunted for food. Targeting development activities to draw population pressure away from fragile areas, and promoting the use of family planning can help secure access to forest resources over the long term. People must have access to alternative, economically competitive, and palatable protein sources, for bushmeat consumption to decrease.

Mr. GILCHREST. Thank you, sir.

Dr. Richard Carroll?

STATEMENT OF RICHARD W. CARROLL, DIRECTOR, WEST AND CENTRAL AFRICA AND MADAGASCAR PROGRAMS, WORLD WILDLIFE FUND

Mr. CARROLL. Yes, Mr. Chairman, thank you for the opportunity to testify today on the devastating impact of the bushmeat trade in Africa and to offer some solutions.

I am Dr. Richard Carroll, Director of the West and Central Africa and Madagascar Program at the World Wildlife Fund. WWF and its 5 million members worldwide is the largest private conservation organization working internationally to protect wildlife and wildlife habitats, and we currently sponsor conservation programs in more than 100 countries.

Many of the issues have been raised by my colleagues, and I will focus my comments on protected areas and logging concession controls and the political process of the Yaounde summit as three viable, concrete, and interrelated solutions to the bushmeat trade in Central Africa.

Protected areas are the only land-use form fully dedicated to biodiversity conservation where wildlife should be safe from gun and snare. In the corridors between these protected areas and in other forests where logging concessions operate, illegal and uncontrolled logging and hunting must be stopped, and transportation routes—roads, railways, and airplanes for the international transport—must be controlled.

As a muddy-boot gorilla researcher who reached silverback or gray-beard status in the forests of Central Africa, let me take you to the ground level for a little run through the jungle, if I may, to show you how one protected area, Dzanga-Sangha in the Central African Republic, got started and its impact on conservation.

In 1976, as a Peace Corps volunteer, I was asked by the Minister of the Environment in the Central African Republic to check out the wildlife conservation potential in the forests of the southwest CAR. I arrived at the remote town of Bayanga, and the next day I was in the forest with my new-found BaAka Pygmy friends, Mekma and Mevanda. It was clear from the tracks, nests, signs, and sightings that this was indeed a rich forest and wildlife punctuated by beautiful forest glades called "byes" in the BaAka language, where wildlife congregates. However, hunting camps were on every stream, and snare trails crisscrossed the animal trails.

We walked over 2,000 kilometers of transsects and confirmed the importance of the forest and the degree of threat to this forest. Mike Fay joined me and completed the surveys in the southern tip of the country. The network of logging roads allowed access to migrant workers from the logging company even to the deepest reaches of the forest, formerly the realm only of the BaAka Pygmies. Company workers check their snares, and the meat returns on the logging vehicles in the evening. The forests is being emptied by outsiders with no long commitment to the region, leaving little for the people that need it most.

For forest people like the BaAka Pygmies whose cultural, physical, and spiritual life depends on an intact forest, forest and wildlife depletion means cultural extinction for these forest people. Where the forest is going and the wildlife is gone, the Jengi, or the forest spirit, is no longer there.

The BaAka said to me that they wanted an intact forest and wildlife and the continued use of these resources, but also the skills to adapt to a changing way of life in this forest. That required literacy, numeracy, and health care. So we set out to try to establish a protected area system that will preserve the forest and the wildlife with a management program that will allow for the continued traditional uses of these resources and provide health care and education that is so necessary.

We named it Dzanga-Sangha and the program was funded by the WWF/USAID Wildlands and Human Needs Program, and continued support has come from CARPE over many years. Additional support came from the U.S. Fish and Wildlife Service Elephant Conservation Act that supported anti-poaching efforts. Former poachers from the local population were trained as protectors, and bushmeat camps and major elephant poachers were quickly reduced.

A training camp was established to train eco-guards for Dzanga-Sangha and other protected areas within the region. Before this protection program began, you were lucky to see one elephant at the now famous Dzanga bye. Today, at any time of the day a visitor may encounter 50 to 200 elephants using this clearing. Research at this bye has identified over 3,000 individual elephants using this clearing alone. I invite you all to come and see this amazing place any time you would like.

By 1990, the Dzanga-Ndoki National Park and the Dzanga-Sangha Dense Forest Reserve were officially created. The interior regulations for the park and reserve called for 90 percent of the tourism revenues to be disbursed locally, and close to 200 people found employment. As local people began to receive the conservation dividend, they began to realize that live elephants at the Dzanga bye were more valuable than dead elephants. Conservation began to be seen as a viable development tool, and the wildlife began to rebound.

We are also working with the logging companies in the region, getting them to take their responsibilities, to close off roads to poachers, to provide alternatives to poaching, and to sanction the transport of meat on their logging vehicles.

We recognize, though, that elephants don't carry passports, and this forest is contiguous across the borders into the Congo and

southeastern Cameroon, and the development of a trinational protected area complex is proposed. Three national parks were developed and officially joined into the Dzanga River Trinational in December 2000, allowing trans-border anti-poaching patrols. Now a poacher apprehended in Dzanga-Sangha can no longer flee into Cameroon or the Congo. The result is a trinational protected area system covering over 7 million acres. This trinational program is a direct result of the unprecedented political commitment expressed in the Yaounde Declaration on Conservation and Sustainable Management of the Forests, signed by the heads of state of six Central African countries in March 1999 and has resulted in the creation of additional forest protected areas totaling approximately 15,000 square miles. And they have a plan for 12 additional transborder programs like the Dzanga River Trinational which they would like to implement in the next 5 years.

In order to stem the bushmeat crisis in Central Africa, we are requesting the leadership of the U.S. Government to support these Yaounde Summit commitments. The key to conservation of the forests in the Congo Basin is the development of an ecologically representative, financial viable protected area network spanning the entire basin from the Mountains of the Moon to the Gulf of Guinea, connected by conservation corridors of sustainably managed forests.

Over the next few weeks, WWF, WCS, and CI will submit a joint proposal to the U.S. Government requesting $15 million a year for 10 years, likely to be administered through CARPE or Fish and Wildlife Service, that we hope will result in over 30 million acres of functional national parks, over 60 million acres of managed logging concessions in the surrounding areas, and a vast reduction in the biodiversity loss through the bushmeat trade.

Mr. Chairman, it is a time of great conservation convergence in the Congo Basin. The stars are truly aligned for the first time in the history where the political will of the region's governments is at an all-time high. Key conservation organizations are taking a common path to support a protected area network spanning the basis. And the U.S. Government has taken leadership in the Congo Basin Initiative, forming a conservation constellation which bodes well for timely efforts in this region.

I have also submitted for the record a report made by the Traffic Bureau on the bushmeat trade in East and Southern Africa that is not included in my oral testimony.

Thank you very much, and I would be happy to answer any questions, and also happy to take you out in the field any time you would like to.

[The prepared statement of Mr. Carroll follows:]

Statement of Dr. Richard W. Carroll, Director, West and Central Africa and Madagascar Program, World Wildlife Fund

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to testify today. I am Dr. Richard Carroll, Director for West and Central Africa and Madagascar at the World Wildlife Fund. WWF is the largest private conservation organization working internationally to protect wildlife and wildlife habitats. We currently sponsor conservation programs in more than 100 countries, thanks to support of 1.2 million members in the United States and more than 5 million members worldwide.

We are here today to discuss the devastating impact of the bushmeat trade in Africa and some solutions to protect the many species affected by this trade. We are

also here to discuss the future of millions of Africans who depend on forest products for their livelihoods. The United States, primarily through programs administered by the Fish and Wildlife Service and USAID—in particular, CARPE—has played a critical role in the protection and conservation of the forest and its wildlife. World Wildlife Fund strongly urges that these programs be increased and expanded to firmly establish a network of ecologically representative protected areas spanning the Congo Basin.

The Bushmeat Crisis in the Congo Basin

- The Bushmeat Crisis in the Congo Basin is a human health and food security issue, an economic and political issue as well as an urgent ecological issue. The bushmeat trade is the leading cause of biodiversity loss in the Congo Basin and is driven by an accelerating logging industry and growing human population.
- Approximately 20 million people depend on the resources of the forest for food, materials and shelter. Consumption of bushmeat is estimated to be about one million metric tonnes per year. As human populations are expected to double in the next 25 years, if no alternatives are found to the bushmeat crisis, it will spell extinction of most wildlife species and result in a massive food disaster.
- If the demand for bushmeat continues to grow as expected, and consumers do not switch to the meat of domestic animals, we can expect that apes and most large bodied forest mammals will be eradicated from the forest, throughout much of the region.
- The bushmeat problem covers both subsistence hunting and commercial hunting. Commercial hunting supplies urban markets in the African countries themselves, and even serves consumption needs abroad where there are large expatriate populations of Africans.
- Projections of future logging trends suggest that an estimated 70 percent of the region's forests could be lost by 2040 unless large-scale changes aimed at conserving the forest and the livelihoods of its native people are taken now.
- At the local level, bushmeat is a survival issue. Simple subsistence is no longer possible. All communities and all families are part of the cash economy, however modestly. Families must pay school fees, buy medicines, purchase salt, sugar, soap and kerosene.
- Civil conflict both stems from and creates resource degradation. Increasingly, military weapons are used by commercial poachers, especially for large animals such as elephants. Most illegal shooting of bushmeat still takes place with shotguns using shells manufactured in Congo or Nigeria. Pressure should be brought to close these factories and limit the availability of hunting apparatus such as steel cable used for snares.
- Logging companies are showing an increasing willingness to collaborate, especially on reduction of bushmeat hunting on their concessions. Examples are the work of WCS in Congo and of WWF with a Malaysian company near the Minkebe reserve in Gabon. These methods hold promise for replication throughout the priority regions.
- The chimpanzee and other primates have been suggested as potential vectors for the emerging diseases related to HIV/AIDs and the recent outbreaks of Ebola have been linked to the handling and eating of wildlife.
- For forest people like the BaAka pygmies, whose cultural, physical and spiritual life depends on an intact forest, forest and wildlife depletion means cultural extinction of these forest peoples.
- WWF is working with governments and private railway companies in Cameroon and Gabon to reduce transport of bushmeat.
- In terms of GDP, all sub–Saharan countries allocate a relatively larger percentage of their budgets to national protected area systems than do either the United States or Canada.
- The Yaounde Heads of State Summit and Declaration have raised the political commitment to conservation in the Congo Basin by a quantum leap and has presented a unique opportunity to establish a coherent conservation plan for the Congo Basin. This plan calls for a regional network of transborder and other protected areas, a halt to uncontrolled and illegal logging, and hunting and greater integration of local populations and the private sector in forest management.

WHY IT IS IMPORTANT: BIODIVERSITY AND RESOURCES IN THE FORESTS OF CENTRAL AFRICA

Stretching from the Mountains of the Moon in eastern Democratic Republic of the Congo to the coast of the Gulf of Guinea, the Congo Basin contains a quarter of the world's tropical forests, covering 2.8 million square kilometers. Forest covers almost

50 percent of the landmass spanning the political boundaries of Cameroon, Equatorial Guinea, the Central African Republic, the Republic of Congo (Brazzaville) and the Democratic Republic of Congo. The Congo Basin is exceeded in size only by the Amazon Basin. The tropical forest block also contains some of the richest biodiversity in Africa, which includes countless plant, animal, and insect species. The region harbors the most diverse assemblage of plants and animals in Africa, with more than 1,000 species of birds and over 10,000 plant species of which about 3,000 are endemic to the region. The forests are home to about 400 mammal species, including intact populations of large mammals, such as forest elephants, gorillas, bongos and buffaloes. They are also important as a source of food, materials and shelter for over 20 million people.

The Central African forests are home to some of the most spectacular and endangered wildlife species in Africa, including one half of the remaining elephants on the continent. A keystone species of these forests are the forest elephants, which create habitat for other wildlife and disperse seeds. Also making their home in this region are the three subspecies of gorilla: the endangered mountain gorilla, the eastern lowland gorilla and the more numerous western lowland gorilla. Other terrestrial wildlife found in the Congo Basin are chimpanzees, bonobo, okapi, and bongo. The rivers of Central Africa harbor some of the richest concentrations of the world's aquatic biodiversity, most of which is endemic. Plant species in the Congo Basin, many with medicinal properties, are numerous and continue to be discovered.

In addition to the myriad species of flora and fauna, the Congo Basin is home to people representing a range of ethnic groups, including the many different groups of indigenous hunter-gatherer people. The BaAka are one such group whose lives and well-being—physical, cultural, and spiritual—are intimately linked with the forests. The forest also represents great economic importance and promise to these people and their countries.

The Congo Basin is also extremely rich in natural resources. The region's crude oil production surpassed four million barrels a day in 2000, more than Iran, Venezuela or Mexico. The United States gets 16 percent of its oil from sub–Saharan Africa—almost equaling imports from Saudi Arabia. By 2015, it is expected that the region will supply the United States with 25 percent of its oil—surpassing the Persian Gulf. The vast majority of this oil will come from the Gulf of Guinea, in the Congo Basin.

Development of this strategic resource area is vital to America's national security. However, unless conservation of the rainforest is expanded now, one resource will simply be traded for another. Both can be used; one can be saved.

WHY IT IS THREATENED: BUSHMEAT, LOGGING, POPULATION GROWTH AND RESOURCE EXTRACTION

Central African forests are under threat by a multitude of factors. Almost four million hectares of Africa's forests are destroyed each year as a result of forest clearance for agriculture to feed the growing number of people in the region. Mineral and oil extraction, unsustainable logging and pervasive political instability are other factors. Road building by logging companies penetrates into the heart of previously remote forests and gives easy access to commercial hunters and buyers of bush meat. This, combined with a lack of surveillance, has led to extreme over-hunting in Central Africa's forests of such vulnerable species as the western lowland gorilla, elephant and leopard. The chimpanzee—recently disclosed as the potential source of the HIV 1 virus in humans and vital to medical research—is also severely endangered; its forest home is being logged and it continues to be hunted and sold as food in Central Africa. With human populations growing at 2–3percent and subsistence level agriculture still the predominant source of food and income for the majority of Central Africans, habitat loss as a result of forest conversion to agriculture, and climate change are likely to be the most significant long term threats to biodiversity. The immediate threats are illegal logging and commercial hunting and trading of wildlife for meat and ivory facilitated by logging operations.

Logging is an economically important land-use throughout Central Africa. All nations within the region are dependent on extractive industries for a large percentage of their Gross Domestic Product, almost all foreign exchange, and much of the tax revenues that finance government expenses. Logging companies have control over 50–80 percent of the forests outside protected areas. In many cases, poor management practices and technical shortcomings cause needless damage and degradation in and around logging concessions, while many operations are carried out in violation of forestry regulations. Although it contributes significantly to national economies and, to some extent, to local needs, illegal logging has a particularly devastating impact on biodiversity. Illegal logging deliberately targets the remaining pristine forests, including protected areas. Available data indicate that deforestation

rates were relatively low until the 1980s, but increased rapidly during the 1990s. This rate is still increasing.

Logging industries directly and indirectly facilitate a large increase in commercial bushmeat hunting. While the hunting of bushmeat has been a traditional livelihood for forest indigenous people, in particular pygmies, the development of a large-scale commercial trade in bushmeat is relatively recent and has been facilitated by the development of logging roads deep into the forest. Current logging practices not only result in increased consumption of bushmeat within concession areas but also facilitate the supply of bushmeat to urban markets and enhance the profitability of the trade.

This alarming level of threat is caused by many inter-linked factors. In general, national governments have continued the forest exploitation policies introduced last century by the colonial powers. They are supported and encouraged in this by multilateral and bilateral institutions, to which they are heavily indebted, as part of the structural adjustment polices and economic liberalization programs imposed as a condition of further lending. Thus, the primary goal of forest policies in the region is to promote industrial timber production for export by allocating most of the forest as logging concessions. Unfortunately, the policy, institutional and legal frameworks for controlling private sector interests and enforcing conservation regulations are extremely weak. As a result, illegal logging practices have flourished throughout the Congo Basin, combined with unsustainable use of other wild resources by a growing population with few economic alternatives to face rising poverty. Other root causes include the lack of technical, scientific and financial resources and, in some countries, political instability and recent wars.

Neglecting the threats from unsustainable forestry operations in the short and medium term will not only undermine the efforts to reduce poverty but will create more poverty. The result of this will be more instability in the Congo Basin. The costs for mitigating the impacts of forestry operations will be much cheaper now than later within the next 10 or 20 years deforestation is likely to be at the maximum. It is critical to urgently mobilize resources to implement a comprehensive strategy to protect the invaluable forests and associated resources within the Congo Basin.

WHAT CAN BE DONE: CROSS–BORDER COOPERATION, PROTECTED AREAS AND SUSTAINABLE LOGGING

The Yaounde Summit

The Congo Basin is a challenging environment for forest conservation. Political instability, high levels of government debt, a decline in export commodity prices and a long history of poor resource management have led some analysts to wonder if conservation can actually happen. However, the good news is that low population densities and large areas of intact forests provide an excellent starting point for forest protection.

One of the most encouraging signs is the growing support among governments and communities in Central Africa for region-wide, collaborative forest conservation. A promising first step was taken in 1996 when the Ministers of Forestry, NGOs and international organizations signed an international declaration for forest conservation—The Brazzaville Process. Coordinated by the World Conservation Union (IUCN), this provides a forum for governments and other stakeholders to work together on forest conservation in the region. What was urgently needed, however, was higher level commitments to forest conservation that could be turned into practical action on the ground.

The Yaounde Forest Summit held on March 17, 1999, hosted by President Paul Biya of Cameroon and chaired by HRH The Duke of Edinburgh, was the first public expression of the high level political will to conserve the forests of Central Africa. The Summit created a unique opportunity for the governments of countries of the Congo Basin to make commitments to forest conservation. Bringing together six African Heads of state and representatives from the international community including the World Bank, the United Nations and European Commission, the summit's aim was: To discuss and conclude new trans-national protected areas in the Congo Basin and agree upon a shared, long-term vision for these forests.

The Yaounde Summit marked a watershed in forest conservation in Central Africa. The summit opened a new era of 'conservation convergence' in Central Africa and was the first time that regional Heads of State came together to develop a coherent plan for the conservation of the second largest contiguous forest in the world. World Wildlife Fund helped organize the summit and the resulting Yaounde Declaration contained plans to protect vast tracts of forest in the Congo Basin. The summit marked a turning point in the political commitment to the region's environ-

ment. A key element is that Central African Governments have set aside areas of great economic value to themselves that are of global biodiversity significance.

Far from being "a series of empty promises," the Yaounde Declaration has resulted in solid conservation achievements in Central Africa. The total amount of additional forest protected areas created, confirmed or in the final stages of gazettement since March 1999 totals 13,866 square miles! In Cameroon alone three new national parks and a gorilla sanctuary have been created. Two other national parks are in the final stages of gazettement. Six new protected areas have been created, covering an area of 5,759 square miles (or 3 percent of the national territory). Furthermore, these areas represent economic forests that have been set aside for conservation in an area where public auction of logging concessions yields offers of the equivalent of $21 per hectare, representing foregone income to the Cameroon Government of over $30 million. In a further indication of political will, the government has recently withdrawn eight logging concessions in an ecologically sensitive area and is negotiating with conservation agencies to find ecologically acceptable alternatives to logging.

Other countries in the region (Gabon, Congo, Equatorial Guinea) have also increased their protected areas in response to the Yaounde Declaration. In the Congo Republic in December 2000, the government announced that it would quadruple the size of the Odzala National Park to over one million hectares, thereby creating one of the largest national parks in Central Africa.

Regional officials took another major step forward in December 2000. A collaborative management agreement between the governments of Cameroon, Central African Republic and Congo has been signed, creating the Sangha River Trinational, which links three contiguous national parks (Lobeke in Cameroon, Dzanga–Ndoki in Central African Republic and Nouabalé–Ndoki in the Congo Republic) protecting 2.8 million hectares extending into all three countries. A similar transborder conservation program covering 15,000 square miles in the boundary region of Cameroon, Gabon and Congo is currently being negotiated. Africa already spends a greater relative proportion of its GNP on its protected areas than does Europe and the United States combined.

Tropical forests represent not only reservoirs of biodiversity but are also important economic resources. Forest exploitation will continue. Recent experiences in Congo (Nouabalé–Ndoki) and Gabon (Minkebe) show that logging companies are increasingly willing to collaborate with conservationists and that when agreements are established, they can effectively control the level of bushmeat hunting.

While Africa has shown considerable political will in creating this protected area network, it is clear that demographic trends and the need for agricultural land are unlikely to result in more than 10 percent of the African territory being set aside for protected areas in the long term.

Conservation in Central Africa should concentrate on securing protected areas and in ensuring that they are well-managed and effectively protected. Central Africa is one of the last remaining areas in the world where vast, fairly intact forest still exist. We have the unique opportunity and political momentum to support the positive efforts fostered within the region to create a world class network of protected areas spanning much of the central African forests, linked by corridors of sustainable managed forests. The potential represented by the Yaounde Summit may be the last window of opportunity for conservation in central Africa and writing it off as 'empty promises' will certainly result in an empty forest.

We live in a world filled with bad news, especially the news which comes from much of Central Africa. It is easy to write these countries off as a loss. I submit that the results demonstrated from the Yaounde Summit represent a great glimmer of hope for the forest, wildlife and people of the region and the world should come to their aid. Failure to substantively act now will be a failure for the international community and an irretrievable loss for humanity.

WWF and its partners recognize that protected areas alone are not sufficient to conserve biodiversity or to ensure the continued provision of vital goods and services from the forest. For this reason, WWF seeks to promote more sustainable management of the vast majority of the world's forest that remain outside of protected areas.

Sustainable Forest Management

The forests of Central Africa are currently under threat from logging as a result of demand for timber from transnational logging companies in Asia and Europe. In 1990, the volume of timber exported from the Congo Basin to Asia was less than 200,000 cubic meters. In 1997, this has risen to over two million cubic meters. Today, in Gabon, 800,000 hectares of forests are allocated to logging concessions and this is likely to increase to more than two million hectares under current pressures.

In neighboring Equatorial Guinea, exports have tripled since 1994. A growing demand for timber in China and other emerging economies has led to exploitation of forests in West Africa's coastal states—where traditionally there have been weak controls and legislation—mobilizing major capital resources with unprecedented speed and flexibility, and exploiting greater proportions of timber resources than ever before. Conservationists predict that most forests which are not currently designated as protected areas will be subject to some logging activity within the next five years.

WWF is promoting sustainable forest management in Cameroon, CAR and Gabon through a collaborative program between WWF Belgium, the WWF–Cameroon Program Office and the WWF–Central Africa Regional Program Office funded by the European Union. In each country, national working groups have been established to develop regional certification standards under the auspices of the Forest Stewardship Council. In addition, WWF is providing support to one private logging company in Gabon to design a sustainable forest management plan which takes into account the impact of the logging activity on biodiversity and the local population.

In CAR, WWF, in partnership with the government, is working to promote sustainable management of the Societe de Bois de Bayanga logging concession within the Dzanga–Sangha Dense Forest Special Reserve. The Dzanga–Sangha Project is charged with assisting in the control of logging operations to ensure that the practices are consistent with the Forestry Code and with assisting in the development of a sustainable forest management plan for this concession.

In Cameroon, WWF is implementing the Jengi initiative, a pilot project to establish sustainable forest management and a protected areas system in the forests of south-eastern Cameroon. Although the Lake Lobeke Reserve (part of the Sangha River Trinational Protected Areas complex) and Boumba–Bek–Nki Complex (a component of the trans border initiative) will preserve part of this forest and help ensure a homeland for the BaAka pygmies, the speed and nature of current commercial logging, if unchecked, will result in three forest islands in a sea of devastation.

Jengi to the BaAka is the spirit of the forest. Jengi presides over the initiation ceremonies of youth and provides guidance for these forest people whose cultural, physical and spiritual live depends on an intact forest. The BaAka have lived in harmony with the forest for centuries and now their songs are being drowned by the noise of bulldozers and chainsaws. Poaching camps follow the bulldozers, the wildlife disappears, and in many villages, the Jengi has not come for years. The Jengi project aims to halt and reverse forest mining, to achieve large-scale sustainable forest management and timber production, to develop alternative sources of income for local communities and to develop a conservation trust fund to support the three protected areas. The aim is to restore the Jengi as the guardian of the forest.

Most of the protected areas in Central Africa are surrounded or impacted in some way by logging concessions. Logging operations often bring in a significant immigrant labor force and become a pole of attraction for others seeking economic opportunities with these companies. Those that find work have money to buy food and clothes, and those that don't have time to kill literally—by becoming bush meat hunters to supply the concession work force. In many concessions, bush meat is the only source of protein available and is sanctioned by the companies, who are responsible to ensure adequate food and supplies to their laborers.

Although to date, the forest certification process has had limited success in Central Africa due to a reluctance by companies to adopt logging practices that may be more costly and where there is limited market demand for certified products, we have found a willingness by companies to try to limit bush meat hunting and transportation on their concessions. Concessions bordering the Minkebe Forest Reserve in Gabon, the Dzanga–Sangha Reserve in CAR, Lake Lobeke in Cameroon and Nouabalé–Ndoki in Congo–Brazzaville have all put in place measures to control bush meat exploitation, including sanctions of employees and drivers involved in hunting or transportation, closing roads to prevent access, providing alternative food sources, and closer collaboration with international NGOs and government authorities.

Congo Basin Initiative

Overall, the key to conservation of the forests of the Congo Basin is the development of a network of ecologically representative, financially viable, protected areas spanning the basin, from the Mountains of the Moon to the Gulf of Guinea, connected by conservation corridors of sustainable managed forests. Over the next month, WWF, WCS and CI will submit a joint proposal to the U.S. government and to private sector donors to co-fund this program. If funded, this program will have a profoundly beneficial impact on the environmental and economic welfare of the Congo Basin.

WWF, WCS and CI believe that expanded U.S. support for the Congo Basin Initiative will demonstrate the leadership role that the United States can and is playing in environmental conservation. U.S. support of this initiative will have a prominent impact at the upcoming World Summit on Sustainable Development in Johannesburg later this year.

The tangible benefits of this project will be:

- Over 30 million acres of functioning national park land in five Congo Basin countries.
- Over 60 million acres of managed logging concessions in surrounding areas.
- Increased number of host governments in natural resource management.
- Significant shift in land-use management practices in host countries.
- Significant and vibrant eco-tourism industry established.
- Increased sustainability from tourism revenue.

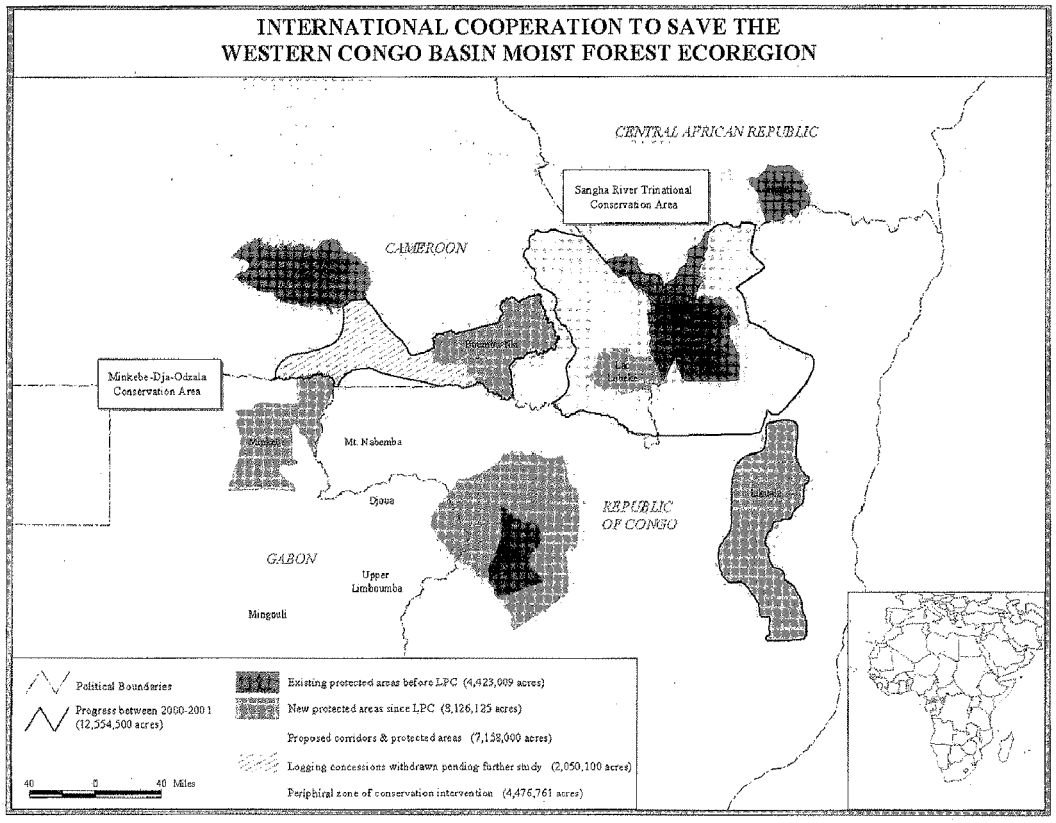
The more intangible benefits of this project will be:

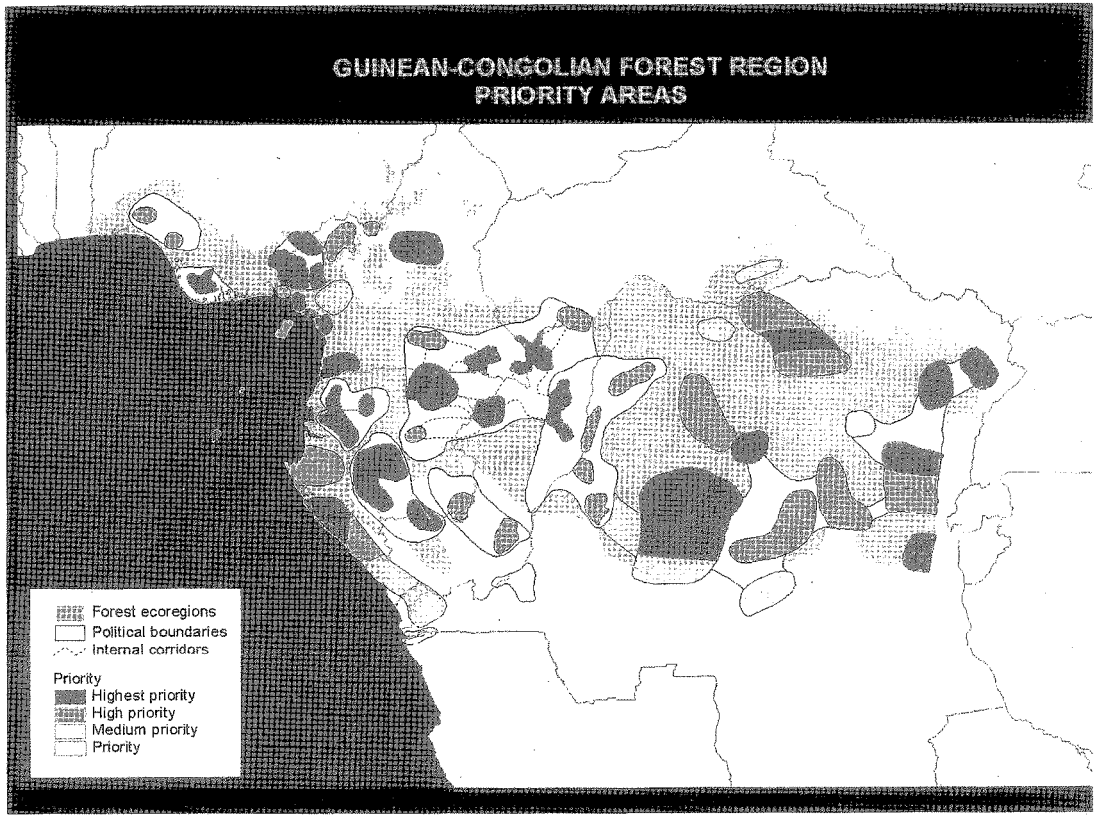
- Reduced rates of deforestation.
- Vast reduction in biodiversity loss.
- Increased U.S. presence and economic opportunities.
- Better governance and transparency.
- Significantly increased security over vast areas of forest.
- Reduction of increase in levels of communicable diseases.
- Sustainable development based on renewable outputs.

In 1995, a USAID program called CARPE was created for Central Africa. This program was designed to increase forest management in the Congo Basin and its extreme success has been documented. WWF, WCS and CI believe that this program should be expanded and extended to coincide with the pressures being put on the Congo Basin from development and other human factors. WWF and other organizations are also seeking vastly increased funding for the African Elephant and Great Ape Conservation Acts. These programs managed through the U.S. Fish and Wildlife service have been extremely instrumental in protection of these keystone species and helping to stem the bushmeat tide.

In closing, Mr. Chairman and members of the Subcommittee, WWF wishes to express our gratitude for your active interest in helping governments in the Congo Basin region to address the bushmeat crisis. We stand ready to assist the Committee in providing constructive solutions to this serious problem.

[Attachments to Mr. Carroll's statement follow:]


INTERNATIONAL COOPERATION TO SAVE THE
WESTERN CONGO BASIN MOIST FOREST ECOREGION
CENTRAL AFRICAN REPUBLIC
Sangha River Trinational Conservation Area
CAMEROON
Minkebe-Dja-Odzala Conservation Area
Mt. Nabemba
Djoua
REPUBLIC OF CONGO
GABON
Upper Limboumba
Mingouli
Political Boundaries
Progress between 2000-2001 (12,554,500 acres)
Existing protected areas before LPC (4,923,009 acres)
New protected areas since LPC (8,126,125 acres)
Proposed corridors & protected areas (7,158,000 acres)
Logging concessions withdrawn pending further study (2,050,100 acres)
Periphiral zone of conservation intervention (4,476,761 acres)
40 0 40 Miles


GUINEAN-CONGOLIAN FOREST REGION
PRIORITY AREAS
Forest ecoregions
Political boundaries
Internal corridors
Priority
Highest priority
High priority
Medium priority
Priority

Mr. GILCHREST. I think we will have to pay a visit maybe sometime this fall.

Dr. Robinson?

STATEMENT OF JOHN G. ROBINSON, SENIOR VICE PRESIDENT AND DIRECTOR, INTERNATIONAL CONSERVATION, WILDLIFE CONSERVATION SOCIETY

Dr. ROBINSON. Mr. Chairman, thank you very much for the opportunity to comment on this issue. I am here to represent the experiences of Wildlife Conservation Society, WCS, which conserves wildlife and wildlands throughout the world.

Fifteen years ago, our field conservationists began to describe a mounting wave of hunting that was affecting wildlife around the world. The wave first passed through Asia, extirpating wildlife in the forests of Southeast Asia. It is now cresting in Africa, and we anticipate that hunting at a similar scale will well in Latin America within the next 5 to 10 years.

The present magnitude of the problem in Africa has captured all of our attention, and our testimony will focus on this part of the world, but recognize that this is a global phenomenon. The phenomenon has been called the "bushmeat" or "wild meat crisis" because hunting is being driven by the demand for wild meat for human consumption.

The Wildlife Conservation Society would like to thank the Subcommittee, and particularly you, Mr. Chairman, for recognizing the importance of this issue.

The recent explosion of hunting in Africa, like the situation in Southeast Asia 20 years ago, has been stimulated by road construction associated with logging and petroleum development. The network of roads reaches into the most remote areas and allows commercial hunters entry into the forest and provides hunters with access to urban markets. It has been open season on all wild species.

The scale of hunting in Africa right now is really truly vast, and you have heard a lot of testimony to that effect. In Central Africa alone, consumption of meat from wild animals is at least one million metric tons, and estimates go as high as five. One million metric tons is equivalent to 9 billion quarter-pound hamburgers of wild meat a year, enough to give even McDonald's pause. There are 33 million people living in Central Africa, and on average, every man, woman, and child eats the equivalent of one bushmeat hamburger each and every day of the year. Central African families eat as much meat as most families in Europe and the U.S., but most of the meat, unlike in Europe and U.S., comes from wildlife.

This level of harvest is not sustainable. Harvest threatens the survival of many wildlife species and is especially pernicious to those large-bodied, slow-breeding species, a special conservation concern, such as great apes, large carnivores, and elephants—all species recognized by the U.S. Congress as needing special attention. And as Mr. Graham said earlier, the loss of wild species affects the functionality and integrity of forests as a whole.

In addition to the forests and the species themselves, it is the millions of rural poor living at the ecological frontier who suffer the most from the loss of wild species. While they themselves hunt and sell bushmeat, they are losing their food resources. These are the

people identified as the focus for the New Partnership for Africa's Development, NEPAD, which was supported at last month's G-8 meeting, who live on less than US$1 a day.

Addressing the bushmeat problem is difficult. In our programs and in the programs of many of our collaborators, we have found some approaches which offer a way forward.

First and foremost, establishing refuges for wildlife populations is essential. A network of well-managed protected areas will both support diverse populations of wildlife and provide reservoirs for wildlife that are being hunted elsewhere.

Second, the commercial trade in bushmeat needs to be regulated and phased out as quickly as possible, and the distinction has been made often between subsistence and commercial trade. Often this can be accomplished by working with the logging companies themselves. As you heard from Mr. Burnam, the Wildlife Conservation Society has been working with a private timber company, Congolaise Industrielle des Bois, and the Ministry of Forest Economy in northern Congo since 1998 to reduce hunting and transport of bushmeat in 4.5 million acres of its concession.

Third, ways to provide alternative sources of animal protein to rural communities and to workers in companies that are exploiting those natural resources must be developed.

The U.S. has several immediate opportunities to help stem the tide of bushmeat hunting. The G-8 Africa Action Plan in support of the New Partnership for Africa's Development, for example, identifies a very general strategy that is of relevance to the bushmeat problem.

We would specifically urge the Subcommittee to: recognize the enormity of the bushmeat crisis, both for wild species and for the ecosystems where they occur, and for the rural poor who have traditionally depended and will depend on wildlife resources; recognize also that the bushmeat crisis is not just about driving some species to extinction, it is not just about great apes and elephants, it is about the destruction of the very fabric of tropical forests and the lives of the people who are supported by those forests.

We also urge that we support the Administration efforts to establish partnerships with African countries and provide support through mechanisms like NEPAD that will strengthen good governance, encourage peace and security, build institutional capacity, and provide the hunting to accomplish these tasks.

And, finally, we encourage Congress to increase funding for the Central Africa Regional Program for the Environment, CARPE, which you heard about earlier, the Multinational Species Conservation Fund, and the Global Environment Facility, GEF. To varying degrees, these underfunded programs support critical conservation activities, including protected areas establishment and management, anti-poaching enforcement, local and institutional capacity building, and monitoring.

I thank you for the opportunity to comment on these issues, and I would be pleased to answer any questions.

[The prepared statement of Dr. Robinson follows:]

Statement of Dr. John G. Robinson, Senior Vice President and Director, International Conservation, Wildlife Conservation Society

Mr. Chairman, Members of the Subcommittee: Thank you very much for the opportunity to comment on the growing problem of bushmeat consumption. I am here today to represent the views of the Wildlife Conservation Society, founded in 1895 as the New York Zoological Society, a 107-year old US-based membership organization. The Wildlife Conservation Society conserves wildlife and wild lands throughout the world, as well as managing animal collections at the Bronx Zoo and other "Living Institutions" in the New York area.

Fifteen years ago, our researchers and conservationists in the field began to describe a mounting wave of hunting that was affecting wildlife living in the forests and grasslands around the world. Since humans evolved we have hunted and eaten wildlife. Today it is only the poorest families that rely on meat from wild species as an important source of protein. This is true even in the United States where families in poor rural districts still hunt for the freezer. When hunting becomes commercial to satisfy demand from urban populations, it quickly becomes unsustainable, as we found in this country at the turn of the last century. Now it is the tropical regions that face a bushmeat crisis. The wave first passed through Asia, extirpating wildlife in the forests of South-east Asia and Indochina. It is now cresting in Africa, and we anticipate that hunting at a similar scale will swell in Latin America within the next five to ten years. The present magnitude of the problem in Africa has captured all of our attention, and our testimony will focus on this part of the world, but recognize that it is a global phenomenon. The phenomenon has been called the "bushmeat" or "wild meat crisis" because the hunting is being driven by a demand for wild meat for human consumption.

The Wildlife Conservation Society would like to thank the Subcommittee, and especially Chairman Gilchrest, for recognizing the importance of this issue. Unrestrained wildlife harvest threatens the survival of many wildlife species, especially those living in the tropical forests of the world. Hunting is especially pernicious for those large-bodied, slow breeding species of special conservation concern such as the great apes, large carnivores, and elephants all species recognized by the U.S. Congress as needing special attention. The local extinction and loss of wild species has cascading effects on the functionality and integrity of forests as a whole, and endangers efforts to both protect and manage those forests in a sustainable fashion. And the loss of wildlife resources threatens people's health and well-being and affects their cultural integrity.

The recent explosion of hunting in Africa, like the situation in South-east Asia and Indochina twenty years ago, has been stimulated by the opening up of previously inaccessible regions. Road construction often associated with logging and petroleum development has created a network of roads that reach into the most remote areas. This network allows commercial hunters entry into the forest, and provides hunters with access to urban markets. Moreover, much of forested Africa has experienced in recent years the additional challenge of civil unrest and conflict. The resulting breakdown of national and local authority has left a governance void in many places and precluded most attempts to manage and control the hunting. It has been open season on all wild species.

The scale of hunting in forested Africa is vast. In central Africa alone, consumption of meat from wild animals is estimated at between one and five million metric tons a year. If we take the most conservative figure of one million metric tons, this is equivalent to 9 billion quarter-pound hamburgers of wild meat a year enough to give even McDonalds pause. Who eats all those hamburger-equivalents? There are 33 million people living in Central Africa, and, on average, every man, woman and child eats the equivalent of on bushmeat "hamburger" each and every day of the year. Central Africa families eat as much meat as do many families in Europe and the United States, with one difference most of the meat eaten in rural Central Africa comes from wildlife.

This level of harvest is not sustainable. We estimate that today's harvest rate in Central African forest is at least five times what could be produced sustainably under even optimal conditions. The consequence of this overexploitation is that wildlife is being strip-mined out of tropical forests, resulting in what has been called the "Empty Forest" a forest without wildlife, unnaturally quiet. Across Central Africa, we are estimating that, except in adequately protected or inaccessible areas, ungulate populations have been already reduced by 50%, primate populations perhaps as much as 90%. Elephants, so long pursued for their ivory, are now also hunted for their meat. Hunters rarely target particular wildlife species because they are simply hunting for meat. So almost all animals from mammals, to birds, to replies are affected by hunting. Constant heavy hunting is destroying local populations of

the most vulnerable species, especially those that large-bodied and breed slowly: gorillas, chimpanzees, bonobos, many monkey species, the large carnivores, and elephants. As species are extirpated from one area, hunters move into new areas.

The loss of wildlife species has wider implications on the forests themselves. The species preferred by hunters generally are large-bodied, typically fruit eaters and herbivorous browsers. These species frequently play keystone roles in forest ecology as pollinators, seed dispersers, and seed predators, as well as comprising the majority of the vertebrate biomass. Their reduction or extirpation produces cascading effects through the biological community, causing other species to disappear, and the ability of the forest to recover from disturbance to diminish.

In addition to the forest and the species themselves, it is the rural poor who suffer the most from the loss of wildlife species. The commercial trade in bushmeat provides only a transitory benefit and a long-term cost to these people. It is the millions of people at the margins of the cash economy, who are at the ecological frontier, and whose lives are intertwined with the wildlife, plants and wider functioning of the forest. It is they who experience drops in daily protein consumption as forests are opened up to outsiders. It is the people identified as the focus on the New Partnership for Africa's Development (NEPAD), launched at last month's G8 meeting, who live on less than US$1 per day. They lack the education, skills and cultural context to take advantage of cash-earning jobs from plantations and industry, and as their wildlife resources disappear, their backs are against the wall. Lacking capital and access to markets, they cannot switch to alternative sources of animal protein.

Addressing the bushmeat problem is difficult. How to impose regulation on a human activity too variable and dispersed to be considered a true industry? How to draw the line between subsistence hunting by local people and commercial exploitation by outsiders, when there are so many examples that fall between the two extremes? How do we tackle a problem that is but an indirect effect of national expansion into the frontier? In our programs we have found some approaches that offer a way forward.

First and foremost, establishing refuges for wildlife populations is essential. A network of well-managed protected areas will both support more diverse and abundant populations of wildlife and provide "reservoirs" for wildlife that are being hunted elsewhere. Establishment of such reserves is thus crucial to steward the resources essential to the nutritional, social and cultural well-being of the rural poor living in forest environments. The Wildlife Conservation Society, and our collaborators WWF and CI, are active in establishing and managing parks throughout the Congo Basin. Proposed and existing parks in the five countries of the Basin might cover some 30 million acres. The key to better management of protected areas is expanding and strengthening staff capacity to regulate access to and use of protected forest resources.

Second, the commercial trade in bushmeat needs to be regulated and phased out as quickly as possible. Many tropical countries lack the government institutions needed to accomplish this. Often the only effective institutions to be found in remote forest areas are the timber companies themselves. The Wildlife Conservation Society, for instance, has been working with a private timber company, Congolaise Industrielle des Bois (CIB), and the Ministry of Forestry Economy in northern Congo since 1998 to reduce hunting and transport of bushmeat in 4.5 million acres of its concession. The effort is a four-pronged one of education, enforcement, provision of alternative sources of animal protein, and monitoring. So it involves the local communities in managing and protecting wildlife populations, and monitors markets in logging camps and villages. It has established an "ecoguard" brigade to close down the commercial trade through the control of vehicle traffic on logging roads, and by preventing wild meat being carried out of the area on flights down to the cities.

Third, ways to provide alternative sources of animal protein to rural communities and to workers in companies exploiting natural resources must be developed. The Wildlife Conservation Society, for instance, is working with the CIB logging company to establish other economically-feasible sources of animal protein for people living within their concessions.

The U.S. has several immediate opportunities to help stem the tide of bushmeat hunting: making nonconcessional debt eligible under the Tropical Forest Management Act; encouraging USAID programs and the UN Food and Agriculture Organization (FAO) efforts that focus on the development of alternative protein sources and livelihoods; and playing a leadership role in establishing an African forest certification program for logging companies that practice wildlife management and help prevent bushmeat hunting and trade. In addition, the G8 Africa Action Plan in support of the New Partnership for Africa's Development (NEPAD) identifies a general

strategy for Africa that is highly relevant to the bushmeat problem. NEPAD calls for:

- Resource mobilization. In the context of the bushmeat problem, there is a need to establish funding mechanisms to support the establishment and sound management of protected areas. Even in the United States, the National Park Service is not economically self-sufficient. Economic incentives are also needed to encourage the timber industry to manage forest resources more sustainably including forest wildlife. Further funds are needed to develop alternative animal protein sources for the rural poor living in the forest frontier.
- Peace and security. This almost goes without saying. The protection of wild areas and the sustainable use of natural resources requires good governance and appropriate management. And this requires political, social and economic stability.
- Governance. In this context there is a need to ensure that national governments have the capacity to engage with the natural resource extraction companies in ways that are transparent and promote long-term, sustainable management of all forest resources. In addition, the responsibility for many management decisions still remain with local governments, and it is important that their authority derives from well-informed, transparent, democratic processes.
- Human resources. To ensure that the capacity to manage Central Africa's wild forests develops to address the threats from unsustainable hunting, we must reinforce and scale up ongoing training mechanisms and launch new avenues for learning and in so doing help educate the next generation of conservation leaders. We need to ensure that the region's resource management agencies have the capacity to protect and manage the region's natural resources.

We would therefore urge the Subcommittee to:

- Recognize the enormity of the bushmeat crisis, both for wild species and the ecosystems where they occur, and for the rural poor who have traditionally depended and will need to depend on wildlife resources and forest biodiversity in the future. Recognize that the bushmeat crisis is not just driving some species to extinction, it is not just about threats to the Great Apes and elephants, it is about the destruction of the very fabric of tropical forests and the lives of the people who are supported by those forests.
- Understand that consumption of bushmeat also has severe public health implications. Handling and eating wildlife, especially apes and other primates, increases the risk that people will contract deadly hemorrhagic diseases such as Ebola, and has facilitated the emergence of new diseases like HIV/AIDS.
- Support Administration efforts to establish partnerships with African countries and provide the support through the NEPAD process and the other identified opportunities for the establishment of protected areas, efforts to curtail the commercial bushmeat trade, and ways to provide alternative sources of animal protein for the rural poor of Africa.
- Encourage Congress to increase funding for the Central Africa Regional Program for the Environment (CARPE), the Multinational Species Conservation Fund and the Global Environment Facility (GEF). To varying degrees, these underfunded programs support critical conservation activities including protected areas establishment and management, anti-poaching enforcement, local and institutional capacity building, and monitoring.

I thank you again for the opportunity to comment on these issues. I would be happy to answer any questions.

Mr. GILCHREST. Thank you, Dr. Robinson.

Dr. Bakarr?

STATEMENT OF MOHAMED I BAKARR, SENIOR TECHNICAL DIRECTOR, CENTER FOR APPLIED BIODIVERSITY SCIENCE, CONSERVATION INTERNATIONAL

Dr. BAKARR. Thank you very much, Mr. Chairman. I have already submitted my written testimony for the record and will, therefore, focus on specific aspects with your permission, sir.

Mr. GILCHREST. Yes, sir.

Dr. BAKARR. I am here to represent the views of Conservation International in my capacity as senior technical director in the Center for Applied Biodiversity Science, which is leading CI's strat-

egy for addressing the bushmeat issue in Africa. Thank you very much for the opportunity to testify on this issue.

CI is a nonprofit organization dedicated to conservation of biodiversity, focusing specifically on the world's biologically richest and most threatened ecosystems where the risk of extinction is so very real, as well as on tropical wilderness areas where opportunities for protecting large tracts of natural habitats still remain. With programs in more than 30 countries around the world, CI's work focuses on demonstrating that human societies are able to live harmoniously with nature. Wildlife utilization in general and the bushmeat issue in particular are, therefore, at the very crux of our conservation efforts and actions around the world.

For more than 10 years now, we have been working with local communities, government agencies, scientists and other conservation professionals to analyze and understand the global implications of wildlife utilization and consumption. From the extensive commercial trade of turtles in Southeast Asia to the subsistence hunting practices of Pygmies in Central Africa, it has become clear to us that the issues at stake are indeed very, very complex.

Mr. Chairman, the bushmeat issue and its consequences for African wildlife and people has been eloquently outlined in the testimony of my colleagues on this panel. Therefore, I do not wish to reiterate the same points but, rather, specifically highlight the concerns that we bring forward as an institution. And I will specifically ask that you allow me to draw one very significant conclusion about the current status quo, and that is, whereas wildlife is still very much an important resource for human livelihoods in Africa, bushmeat utilization is no longer sustainable because populations of most of the species involved are being greatly impacts and some locally extirpated throughout their range. And as you can rightly surmise, this implies a double-edged sword with respect to the bushmeat problem in Africa. On the one hand, populations are being extirpated; on the other hand, the livelihood of a great majority of people is increasingly at risk from the loss of wildlife. It is this complex challenge we are confronted with for achieving conservation on the continent.

As a conservation organization that cares about people and wildlife, CI has been very keen on exploring and implementing solutions that accommodate this concern. We are committed to pursuing an integrated approach that accommodates diverse perspectives and involves multiple stakeholders and partners to maximize success in mitigating the threat. In this regard, we have helped organize regional workshops in West and Central Africa where major stakeholders have analyzed and discussed the social, cultural, economic, and biological contexts, and have helped establish frameworks for developing and implementing solutions. Our involvement in the BCTF also reflects our commitment toward a broader alliance to tackle this complex and large-scale problem.

More specifically, our country programs are confronting the problem head on in the field by targeting all major stakeholders at the national level. In Ghana, for example, the focus has been on mobilizing the public through a massive awareness and sensitization campaign based on cultural and traditional practices, known as totems. Totems are wildlife entities, mostly animals, that symbolize

cultural values and beliefs to people. Although success is yet to be translated in terms of actual reductions in bushmeat hunting and threats to wildlife, the effort to link bushmeat problem to totems has garnered the attention of all Ghanaians. We are pursuing similar approaches in Liberia with our partners, in Cote d'Ivoire and Sierra Leone, in order to find locally appropriate solutions to the problem.

Mr. Chairman, the scale of the bushmeat problem in Africa is enormous. Long-term success, therefore, requires solutions that are scaled up proportionally to ensure a balance between human livelihood needs and biodiversity. The piecemeal approach simply has not worked, and even when it does, we are only prolonging the inevitable. We need landscape approaches that allow integration of social, economic, and biological priorities. This is no doubt a daunting task for African countries and conservation organizations, and one that will require major investment and commitments by governments and funding agencies.

The leadership of U.S. Government agencies in supporting bilateral initiatives on biodiversity conservation across Africa has been formidable, as we heard this morning. The bushmeat crisis cannot be separated from all other conservation challenges on the continent, which means that the U.S. Government assistance through the USAID and international programs of the U.S. Fish and Wildlife and the USDA Forest Service has already made crucial contributions in one way or another toward addressing the problem. Therefore, I propose here that considerations be given to the following specific strategies for increased funding from the U.S. Government, possibly through an especially targeted mechanism:

The expansion and effective management of protected areas is absolutely crucial. As we heard this morning from my colleagues, it is the only way we can guarantee the survival of viable populations of wildlife on the continent. Protected areas are for people. They are not against people. That message will be made clear.

We need to promote alternative sources of protein. Africans are very good at adapting. All of the wildlife can be hunted to extinction, and people will still have protein to feed on. So what is stopping us from raising the profile of those alternative sources right now when we have a chance to save wildlife from extinction?

We need to be very, very strong and efficient at monitoring activities of extractive industries. Many of these countries depend on extractive industries as a major source of income. If we cannot stop those industries, we need to make their practices much more efficient.

We need to raise public awareness and engage wider involvement of people across the continent. There are traditional and cultural implications for using bushmeat. We cannot work against people. We have to understand their perspective and build it into our strategies in order to succeed at the bigger scale.

And, of course, we still need to promote more research and enhance our understanding of the species at hand.

I thank you very much once again, Mr. Chairman, and applaud the efforts of this House Subcommittee in its attempt to understand the ramifications of this critically important challenge in

Africa. We look forward to working with you on any initiative that will emerge from this hearing.

Thank you.

[The prepared statement of Dr. Bakarr follows:]

Statement of Dr. Mohamed I Bakarr, Senior Technical Director, Center for Applied Biodiversity Science, Conservation International

Mr. Chairman, members of the Subcommittee, and colleagues on this panel good morning. I thank you all very much for the opportunity to testify before you on the growing problem of bushmeat consumption in Africa. I am here to represent the views of Conservation International, in my capacity as Senior Technical Director in the Center for Applied Biodiversity Science, which is leading CI's strategy for addressing the bushmeat issue in Africa. CI is a non-profit organization dedicated to the conservation of biodiversity, focusing specifically on the world's biologically richest and most threatened ecosystems where the risk of extinction is ever so real, as well as on tropical wilderness areas where opportunities for protecting large tracts of natural habitats still remain. With programs in more than 30 countries around the world, CI's work focuses on demonstrating that human societies are able to live harmoniously with nature. Wildlife utilization in general and the bushmeat issue in particular are, therefore, at the very crux of our conservation efforts and actions around the world.

For more than 10 years now, CI has been working with local communities, government agencies, scientists and other conservation professionals to analyze and understand the global implications of wildlife utilization and consumption. From the extensive commercial trade of turtles in Southeast Asia to the subsistence hunting practices of pygmies in Central Africa, it has become clear to us that the issues at stake are indeed very complex. Although bushmeat utilization has been flagged since the early 1960s as a potential long-term threat to wildlife populations in Africa, it is the same practice that has sustained the livelihoods of many generations of Africans. For the most part, people in Africa still hunt wildlife and consume bushmeat for the same reason their forefathers before them did. Bushmeat hunting has been a tradition and a way of life in Africa for eons, and all animal species (from rodents to great apes) are hunted for consumptive use.

But like for many other facets of life on the continent, the ethics of wildlife exploitation has undergone dramatic changes in recent years. Human populations have grown rapidly on the continent, and more people are now engaged in the exploitation of wildlife than ever before. More importantly, use of low-tech hunting tools such as traps have been replaced by easily accessible guns and rifles that facilitate rapid extirpation of large numbers of animals. With access to more powerful and highly effective weapons, large mammals such as elephants and great apes that were once hunted by only the most experienced and traditionally revered hunters, have become easy prey for the commercially minded hunters. These itinerant commercial hunters are in turn being aided by gradual transformations of the African landscape through the activities of extractive industries (logging and mining), which are opening up previously remote areas and creating transient settlements.

Mr. Chairman, members of the Subcommittee and fellow panelists, I do not need to reiterate the consequences of these transformations for Africa's wildlife and biodiversity, because the media has done an excellent job bringing it to the global community. Please allow me, however, to just draw one very significant conclusion about the current status-quo. And that is, whereas wildlife is still very much an important resource for human livelihoods in West Africa, bushmeat utilization is no longer sustainable because populations of most of the species involved are being greatly impacted, and some locally extirpated throughout their range. As you can rightly surmise, the bushmeat problem in Africa has emerged as a double-edge on the one hand, wildlife populations are being extirpated, and on the other, the livelihood of a great majority of people is increasingly at risk from the loss of wildlife. It is this complex challenge we are confronted with for achieving biodiversity conservation on the continent.

As a conservation organization that cares about people and wildlife, Conservation International has been very keen on exploring and implementing conservation solutions that accommodate this concern. We are committed to pursuing an integrated approach that accommodates diverse perspectives and involves multiple stakeholders and partners to maximize success in mitigating the threat. In this regard, we have helped organize regional workshops in West and Central Africa where major stakeholders discuss and analyze the social, cultural, economic and biological contexts, and establish frameworks for developing and implementing solutions. Our

involvement in the Bushmeat Crisis Task Force (BCTF) also reflects our commitment toward a broader alliance to tackle this complex and large-scale problem. Through BCTF, CI and other organizations committed to saving biological diversity around the world have been able to reach decision-makers and the general public, with the strongest possible messages that reflect our collective concern on this crucial issue.

More specifically, CI country programs are confronting the problem head on in the field by targeting all major stakeholders at the national level. In Ghana for example, the focus has been on mobilizing the public through a massive awareness and sensitization campaign based on cultural and traditional priorities, such as totems. Totems are wildlife entities (animal species) that symbolize cultural values and beliefs. Although success is yet to be translated in terms of actual reductions in bushmeat hunting and threats to wildlife, the effort to link bushmeat problem to totems has garnered the attention of all Ghanaians. To put this into an even better perspective, let me quote a recent message from the Director of CI's Ghana Program, Okyeame Ampadu–Agyei: "The bushmeat crisis is now receiving national attention. This is mainly due to our sustained awareness campaign based on the conservation of totems in Ghana. The new concept has galvanized the entire citizenry to address the problem by involving politicians, traditional rulers, hunters, market women and the general public. The attached paper presents the novelty approach. It shows how our culture is inextricably linked with animals. This could be the final key to address the bushmeat crisis in many parts of Africa."

Mr. Chairman and members of the Subcommittee, the scale of the bushmeat crisis in Africa is enormous. Long-term success therefore requires that solutions such as those emerging in Ghana be scaled-up proportionally to ensure a balance between human livelihood needs and biodiversity conservation goals. Additional approaches are needed to ensure effective protection of species already threatened by the commercial trade. This is in no doubt a daunting task for African countries and conservation organizations, and one that would require major investment by governments and funding agencies. So what role should the U.S. Government play? The leadership of U.S. Government Agencies in supporting bilateral initiatives on biodiversity conservation across Africa has been formidable. The bushmeat crisis cannot be separated from all other conservation challenges on the continent, which means that U.S. Government assistance through the Agency for International Development (USAID), and International Programs of the U.S. Fish and Wildlife and the U.S.D.A. Forest Service has already made crucial contributions in one way or another toward addressing the bushmeat problem. Therefore, I propose here that considerations be given to the following specific strategies for increased funding from the U.S. government, possibly through an especially targeted mechanism:

- Creation, expansion and effective management of forests parks and protected areas: The creation, expansion and effective management of forest parks and protected areas that maintain a safe haven for forest animals is the only way of guaranteeing viable populations of many wildlife species on the long-term. It is from these last remaining natural areas that repopulation of depleted landscapes can occur, to give future generations of Africans a chance at sustaining traditional livelihood practices.
- Promotion of alternative sources of protein: As long as people depend on wildlife as a source of protein, bushmeat hunting will remain a major factor in sustaining rural livelihoods. But the commercial trade can be greatly reduced by promoting stable, competitively priced supplies of animal protein other than bushmeat, particularly in urban areas across the region, where bushmeat is more of a luxury food item.
- Monitoring and influencing activities of extractive industries: By working closely with extractive industries such as logging and mining, government agencies and conservation organizations can ensure that activities associated with resource extraction (i.e. the creation of roads etc.) do not lead to the widespread slaughter of wildlife for commercial purposes.
- Promotion of public awareness raising and public education on risks of bushmeat consumption: The traditional, cultural and livelihood implications of impending wildlife extinctions are still not effectively understood by most Africans. With recent reports of potential links between bushmeat consumption and HIV (the virus that causes AIDS in humans), there is need to use this critical message as part of a large-scale effort to change attitudes towards bushmeat hunting and consumption.
- Promotion of research on sustainable hunting: There is need to continuously increase understanding of wildlife population dynamics by conducting research and monitoring to determine the practicality of sustainable hunting for long-term survivability of animal populations.

I thank you very much once again, Mr. Chairman, and applaud the efforts of this House Subcommittee in its attempt to understand the ramifications of this critically important conservation challenge in Africa. We look forward to working with you on any initiative that will emerge from this oversight hearing.

Mr. GILCHREST. Thank you very much, Dr. Bakarr.

Each of the witnesses today at one point or another made reference to more resources, and some of you have mentioned specifically the United States and have given us actual figures for those resources, which is always helpful.

Dr. Bakarr, you mentioned a number of things that you would like this Committee and the Congress and the United States to consider with our participation in preserving and restoring much of the beauty and the magnificence of the forests in Africa. You suggested that we participate more in the expansion of protected areas, alternative sources of protein, monitor extractive industries, more public awareness, and so on.

What would be helpful for us to pursue those goals, along with a number of other goals that you have all suggested and made some specific dollar amounts available, would be to give us in our deliberation with our colleagues to win their heart and mind to vote for these issues. Apparently the road to Damascus enlightened Paul and enlightened apparently this logging company from Europe. It doesn't always work in the bowels of the House of Representatives.

But what makes it easier is for us to be as specific and as targeted as possible with these issues, so what would be helpful, Dr. Bakarr—and I am not sure if you are prepared to do it here, but if you gave us a map of Africa, Central Africa, West Africa, and you said here is where the—here are the areas that are benefiting from this type of attention. This is where the people are finding alternative sources of protein. These are the protected areas that we need to expand, and this is why we have to expand them, because of the hydrology, because of the species that are there, because of the stability of the community. Here is the local community that we can get into in Liberia. When we mention Liberia in the Congress, we see instability, we see tragedy, we see horrific acts; Sierra Leone, to some extent as well.

So if you could be—and your colleagues this afternoon, you can educate us, and I think it is a good idea. I am not sure who mentioned the Bushmeat Congressional Caucus. We wouldn't serve any endangered species. We might serve some invasive species that we have here in this country. And I also think that is a good idea to have a Bushmeat Caucus to connect us with your issues.

But, Dr. Bakarr, just two questions. Can you give us some specific areas that need to be protected and how would they be protected? And what would the acreage be? Do you have any idea as to the alternative sources of protein which would involve local agriculture that would be beneficial? Some ideas on how to monitor the extractive industries. It is hard for us to monitor our extractive industries in this country with all our capabilities. And one last question: Is there a future for subsistence consumption in Africa?

Dr. BAKARR. Thank you very much, Mr. Chairman. That is a very excellent question.

With respect to protected areas, I think I can reiterate that the efforts on the ground currently have been site-based. They need to be scaled up at the regional level, and those sites where investments have been making tremendous achievements can then become core areas that we can build upon to expand across the larger landscape that we are discussing. Such a proposal is already coming forward, as you heard from one of my colleagues here, through a partnership involving all the major international NGO's and the U.S. for Central Africa. We don't have yet such a large-scale partnership for West Africa, and we need that in order for protected areas to be scaled up to that level.

The approach here is that various institutions usually focus on holding onto sites where they believe viable populations of species exist. But if you can integrate those sites into bigger sites, bigger areas, then you have a chance of building stronger and more efficient landscapes for longer success in conservation, and that is the approach we hope to take in West Africa as well.

In West Africa, Liberia and Ivory Coast represent the best hope for safeguarding biodiversity, not only just wildlife but also the forest ecosystem itself because they have the best tracts of forest left at the moment. There are still significant tracts in Sierra Leone, but they are becoming increasingly isolated from the rest of the forest block, and efforts need to be made to make those links as well. But as you correctly pointed out, the issue of stability is a big one right now, and it is probably going to take us a few more years before we can get to that level.

With respect to alternative protein, the forest ecosystem in West and Central Africa is very difficult to raise domesticated animals. It is not an easy thing. And so the majority of the people have relied on fish resources and occasionally some vegetable crops as well for alternative sources of protein. Now, if wildlife were to disappear completely, Africans are so adaptive that they will find something else to focus on as a priority, and I will not be surprised if fish, both freshwater and marine, don't play a major role in that. There is a lot of fish—in fact, there are graphics to show that many of the countries where bushmeat is a problem produce the largest tonnage of fish that is consumed domestically.

Mr. GILCHREST. Is this fish farming? Is this aquaculture?

Dr. BAKARR. Aquaculture, collection from freshwater sources, as well as marine fisheries. So there is no shortage of alternative sources of protein. The real dilemma we have is being able to sensitize the public to understand that wildlife is not as sustainable as they might think. And what we are ending up with is smaller and smaller bodied animals, which people are fine with. They will eat them. They will live on cane rats. That is no problem at all. So to them, all this noise about bushmeat is not real because they get hundreds of ken rats every day. But the reality is the large mammals are disappearing because they are the ones that are easy targets, they are the ones that are easy prey. They bring more money. They are more cost-effective for the hunter.

So our problem is not a shortage of protein. It is being able to raise the profile of those that are more sustainable so that the pressure on those that are not can be reduced and eliminated in the long term.

With respect to monitoring extractive industries, I think there are very good lessons already from programs in Central Africa, but they will not succeed without good backing and support from the government. And I think that is the dilemma we have in Liberia, unfortunately. With the good support of government agencies, logging companies can be monitored effectively by NGO's and local partners. Not a problem.

Mr. GILCHREST. Does anyone else want to comment? Dr. Robinson?

Dr. ROBINSON. Thank you, Mr. Chairman—

Mr. GILCHREST. Just to interrupt just for a second, you can also comment on this. I know I fired a lot of questions out at you, Dr. Bakarr. And all of you, I would like your input on those questions, and also the question of is there a future for subsistence living, farming in this part of Africa.

Dr. ROBINSON. Thank you, Mr. Chairman. Dr. Bakarr actually addressed, I think, these questions extremely well, but let me elaborate on a couple of these ideas.

One, let me reiterate that certainly in Central Africa right now we are seeing this constellation of stars coming together that Dr. Carroll talked about, that the conservation community is developing a very systematic consensus on really what is needed, and that consensus involves the establishment of protected areas. And we are talking about 30 million acres of land which could be under protection, double that under some kind of management, forest management.

Mr. GILCHREST. So we are talking about 60 million acres.

Dr. ROBINSON. There are about 30 million acres in protected areas and about 60 million acres in managed forests.

Mr. GILCHREST. There are 30 million acres right now in protected areas?

Dr. ROBINSON. About 8 right now.

Mr. GILCHREST. Eight.

Dr. ROBINSON. Yes, but there is the potential of basically getting up to about 30. There are discussions going on with African governments and within the community to establish those areas at the present time.

Mr. GILCHREST. This would be in Central and West Africa?

Dr. ROBINSON. This is primarily Central Africa.

Mr. GILCHREST. Central Africa.

Dr. ROBINSON. That is correct. At the present time, funding going into Central Africa for environmental and conservation reasons probably doesn't exceed more than about $12 million a year, and that is from bilateral, multilateral, and all conservation organizations. The amount of funding going into Central African conservation is insignificant.

Mr. GILCHREST. It is $12 million.

Dr. ROBINSON. Yes, $12 million.

Mr. GILCHREST. From all sources?

Dr. ROBINSON. From all sources. And so the potential, there is a political will in Africa which is really exciting right now. There is a consensus among the conservation organizations within—

Mr. GILCHREST. Where did the $12 million come from?

Dr. ROBINSON. Pardon?,

Mr. GILCHREST. That is everybody?,

Dr. ROBINSON. That is everybody. It is actually shocking when you add it up. And, clearly, there is an opportunity to make a huge difference with not very much more of an increment.

And so when you hear calls for additional funding through mechanisms like CARPE, through the multi-species funds, we have mechanisms in the U.S. to provide that kind of funding.

I think there is also the potential to work very systematically with logging companies who are increasingly under pressure to say that they are producing wood in a more sustainable way and having less of an impact on the forest landscape, especially with respect to wildlife.

Mr. GILCHREST. Is one of the criteria for the logging companies to replant after they log? Can you replant that type of forest?

Dr. ROBINSON. At the present time, few, if any, companies are doing any replanting. At the minute they are very much high grading, just taking off a few trees, a few high-value trees over very, very extensive areas. So the impact on the forest, if you look at the forest, sometimes it is not that great. But as the logging companies move through the forest, they hunt, and the forest is just being stripped out. But those companies are interested in working with conservation communities, with certification agencies, and I think there is a real potential to have an impact there.

Let me just sort of say something very quickly about the future of subsistence hunting in Africa. Even in the United States, people still hunt for the freezer. And those are people for the most part who have the opportunity and who frequently have their backs against the walls in other contexts.

In the long term, subsistence hunting in Africa will have to dwindle. But I think the major thrust at the minute is not focusing so much on stopping the subsistence hunting because we don't have the alternative sources of protein to replace in much of Africa at the present time. The real thrust from a conservation standpoint and from a sustainability standpoint is to really focus on that commercial hunting, because it is the commercial hunting which is having the impact.

Mr. GILCHREST. So you would say, Dr. Robinson, that the local consumption compared to the lucrative cash markets is small?

Dr. ROBINSON. The amount of meat which is actually being consumed for subsistence may be actually as high as about three-quarters of all the meat which is being hunted. But it is that quarter which goes to the commerce which is hitting the large species, hitting those species which people want to eat, and is basically pushing the whole system over the top.

Mr. GILCHREST. That is a vote, but I think we can finish.

Dr. Carroll?

Mr. CARROLL. Yes, thank you very much. You asked about specific targets for the development of protected areas across the Congo Basin, and in my written testimony I have included a map of conservation priorities that were developed in a workshop facilitated by WWF, but it included 160 experts on biodiversity and biogeography in the Congo Basin. And this was produced really at the request of the Yaounde Summit governments as they were trying to develop a coherent plan for the Congo Basin conservation.

So we got together; you know, all these experts developed a map of conservation priorities with the key overlap areas of species diversity, species richness, and opportunity for conservation. And that map has been adopted, as well as the blueprint for the conservation by the Yaounde Summit. And their plans that they are trying to put in place in the next 5 years are based on the landscapes identified in this map.

Now, WWF and WCS are working with these countries to try to refine those big priority blobs on the map into really specific areas defined with limits that could be potential protected areas.

For instance, in the country of Gabon right now, the Government of Gabon is very interested in very quickly putting in place 12 new national parks that are being proposed by the joint work of WWF and WCS. And we are very optimistic that will be put in place, but that is a result of this priority-setting exercise, the Yaounde Summit commitment to putting 10 percent of each national country's forest into protected area management—into protected areas. And when we talk about the cost, that map that you see in front of us, our estimates—just to put in place protected areas to cover only 10 percent of the Congo Basin in protected areas, our estimates are that that could range up to $100 million a year in cost to do that.

So when we are making—as Dr. Robinson pointed out, currently our levels are so far below that, you know, $12 million, that we have a major gap, and we are hoping for leadership from the U.S. Government to try to help fill those gaps and help—

Mr. GILCHREST. Your recommendation was $15 million.

Dr. ROBINSON. Yes.

Mr. GILCHREST. A year, for 10 years.

Dr. ROBINSON. Yes, sir. To go through, probably through CARPE, because CARPE we look at as a mechanism to bring together—that brings together the—

Mr. GILCHREST. Is there a commitment—some of us will try to reach that commitment. Are you asking—it would be actually a little bit easier for us to do it if we knew that Japan, England, France, Germany, Italy, whoever, they were also making a commitment.

Dr. ROBINSON. Yes, and we hope that happens as well. We hope that the leadership of the U.S. Government will push those other countries to make that commitment. The European Union has been a major supporter of protected areas through a program called ECOFAC that has been managing six protected areas across the Congo Basin. And we are going to urge them, based on the leverage that we hope will come from the U.S. Government Congo Basin Initiative to continue their funding for the same period of time for those protected areas so that it nestles together very well.

Now, the governments are also making commitments to put these in place through the Yaounde process. They are putting their own money on the table to get these areas in place. You know, there have been many declarations by heads of state, but this one really seems to be taking hold because of the international spotlight that is being put on it.

Like I said, since 1999 there have been 15,000 square kilometers of new protected areas put in place through this process, and they have committed to 12 major landscapes in protected areas. And if

we can only keep that encouragement going by providing the funding for that—

Mr. GILCHREST. We will do our best. I don't want to interrupt, but I think there is a vote going on. There is more than one vote, apparently, so I am going to have to wrap this up in just about 2 minutes, and I apologize for that. Here comes the buzzers again.

Just a couple more questions before I leave, though, and you have all been very, very helpful. Dr. Hutchins and all of you mentioned in various ways the bushmeat trade. is there any way to know where the more expensive markets of the bushmeat trade are, that 25 percent?

Mr. HUTCHINS. I might just address that. Actually, BCTF has been working on a project that is intended to try to identify not only where the major markets are but the important trade routes, where is the bushmeat being transported to and from, because we do feel that these are important places where control could be effected. And this is called the Bushmeat Hot Spots Map Project, and we are working with our members, which are, in fact, represented by all the organizations that are at this table, and with the CITES/MIKE people who have been for several years monitoring the trade in elephants, illegal trade in elephants and the taking of elephants throughout Africa.

We are hoping to try to bring those processes together because they do collect a lot of information on bushmeat as well. So the monitoring, I think, will be very important for developing a strategy to address the bushmeat issue.

Mr. GILCHREST. Bring a big light and a camera, show somebody eating gorilla meat in a restaurant in Paris or Washington, D.C., God forbid.

Mr. Agnagna, you stated very eloquently some of the ancient traditions and sacred rules of the various peoples of the continent of Africa. And we talked about subsistence farming and the future of it. Can some of those ancient traditions and sacred rules of managing resources be retained and passed along to succeeding generations?

Mr. AGNAGNA. I didn't get the last part of the question.

Mr. GILCHREST. Can the traditions, the ancient traditions of subsistence farming, with their sacred rules, are they still alive in the hearts of people in Africa? And are they being passed down to the children?

Mr. AGNAGNA. I will say that in the deep Africa—I am talking about a village.

Mr. GILCHREST. Yes.

Mr. AGNAGNA. I think the villager or the local population, the rural population, they still have those traditions. The problem is that, as I said, you know, the modernization, the technology, but people in the deep village, they still have this tradition. The problem is that our laws are modern laws. They didn't take really in consideration the rules, the traditional rules.

What I am—you know, I wanted to say that now there is a process in Central Africa, a big process of revising wildlife laws, and we want to include—we want to take some of the values, traditional values and put them in the laws, because I think that that was really the best way. I don't think that the population or the

local population—they don't have some more to learn from modern conservation because they know, they know how to manage, how to manage the natural resources.

Mr. GILCHREST. Maybe we can blend the two together. I hope the spirit of the forest stays in the forest.

Thank you all very much. I appreciate it. We will stay engaged.

The hearing is adjourned.

[Whereupon, at 1:05 p.m., the Subcommittee was adjourned.]

[Additional material submitted for the record follows:]

[The article "Bushmeat and the Origin of HIV/AIDS" submitted for the record follows:]

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"BUSHMEAT" AND THE ORIGIN OF HIV/AIDS:

A Case Study of Biodiversity, Population Pressures, and Human Health

FEBRUARY 2002

The Center for Health and the Global Environment at Harvard Medical School, Population Action International, the Jane Goodall Institute, and the Environmental and Energy Study Institute co-hosted a Congressional briefing, entitled "Bushmeat and the Origin of HIV/AIDS: A Case Study of Biodiversity, Population Pressures and Human Health." The AIDS epidemic is a global problem with challenging social implications and no easy solutions. In the United States and around the world, citizen groups and governments are rallying to help scientists find a cure for HIV/AIDS and encouraging widespread education about the disease. To date, over 60 million people have been infected with HIV (human immunodeficiency virus), approximately five million more become infected each year, and over 20 million have died from the disease.

In their quest to understand more about this deadly disease, researchers have sought to understand where it came from, and how humans contracted it. What they have discovered is that many answers about HIV and even the potential cure will most likely come from the same place as the original source of the disease – from chimpanzees and a monkey called the sooty mangabey in the West Central African forests. Unfortunately, it is also becoming frighteningly clear that human actions and population pressures are destroying these forests and the species that inhabit them at alarming rates, which may have significant implications for human health.

PANELISTS

Eric Chivian, M.D.
Director, Center for Health and the Global Environment, Harvard Medical School

Stuart Pimm, Ph.D.
Professor of Conservation Biology, Columbia University

Robert Engelman
Vice President for Research, Population Action International

Jane Goodall, Ph.D., C.B.E.
Founder and Trustee, The Jane Goodall Institute for Wildlife Research, Education, and Conservation

Beatrice H. Hahn, M.D.
Professor of Medicine, University of Alabama at Birmingham

OVERVIEW

Through harmful activities in relation to the environment, Dr. Eric Chivian, director of the Center for Health and the Global Environment, stated "humans are creating a crisis of unprecedented proportions, going on at several levels at once." Rapid and unchecked human population growth near wilderness areas; the purposeful clearing of forests by farmers, loggers and miners; and the continuing bushmeat trade – which is the practice of hunting forest animals commercially for food – are combining to irreversibly mar a number of "biodiversity hotspots" in Africa and around the world. But humans are not simply destroying some of the most precious forests in the world and causing the

extinction of species, they are also creating the conditions that make possible the spread of animal viruses to people. Through extensive analysis of HIV, scientists have come to believe that the disease is a zoonosis – a disease transferred from animals – that humans first contracted from chimpanzees and sooty mangabeys by being exposed to their blood through handling and eating the slaughtered animals. And even more distressing for many African governments and citizens is the fact that the bushmeat trade is most likely exposing countless people to new primate viruses that have the potential to cause other epidemics. The ebola virus looms as one threatening example. Dr. Beatrice Hahn, professor of medicine at the University of Alabama at Birmingham, stated that "with the ebola virus, we have been lucky because it has not spread."

In fact, as Dr. Chivian noted, AIDS is just one of many powerful stories that can be told "to illustrate how we, the human species, are an intricate part of nature, and that we cannot threaten the survival of other species without ultimately threatening ourselves." Also, species can be linked to cures for diseases, and chimpanzees, in particular, have a lot to offer to the scientific community. DNA analysis found that humans are almost identical genetically to chimpanzees, differing by only 1.5 percent. According to Dr. Goodall, "We find that chimpanzees have an intellectual [and emotional] capacity that we once thought unique to ourselves... In my 42 years of research at Gombe [National Park], the most important thing that has emerged is how like us they are – or rather, how like them we are."

BIODIVERSITY "HOTSPOTS"

Many potentially beneficial species are dying out as forests continue to be destroyed, often to create farmland to support growing human populations. According to Dr. Stuart Pimm, professor of conservation biology at Columbia University, about half of the earth's tropical forests have disappeared in the past fifty years. Pimm projected that at current deforestation rates, almost all of the world's remaining tropical forests will be lost in thirty to forty years – "not just in the lifetimes of the small children that are here, but in the lifetimes of some of the more senior people here." About a third of forests in Central and in West Africa, where many of these chimpanzees live are already lost. These forest areas have diminished to 50-60,000 square miles from about half a million square miles just fifty years ago. With the loss of these forests, tragically, the world is also losing an incredible amount of plant and animal biodiversity. "We are actually in the midst of the sixth extinction event of the last 500 million years," Dr. Chivian stated. Although the earth has gone through extinction periods similar to now, scientists know that recovery will take millions of years. Chivian cautioned, "Our behavior is not just making the world a more impoverished place biologically now and for our children, but perhaps for all human children to come, as the human species, like other species, may have a natural life span of only a few million more years."

In the face of such disheartening statistics, it must be determined where to focus limited resources. Researchers have identified a number of biologically-sensitive areas, termed "hotspots," which contain high species concentrations. Dr. Pimm stated that "a high percentage of the variety of life on earth is found in just twenty-five hotspots," which make up just 1.4 percent of the earth's total land area; a significantly higher figure is reached if the Amazon, Congo, and New Guinea rainforest regions are included. However, these areas "are shrinking on a day-by-day basis," Dr. Pimm continued. "When you fly over the Amazon, you can see it going up in smoke; the same goes for the Congo."

HARMFUL IMPACTS OF LOCAL HUMAN ACTIVITIES

The root of the problem lies with the past hesitancy of governments to make the environment a priority, especially when their economies are lagging, which is partly due to a lack of recognition of the value of the forest areas in their nations. Foreign logging and mining companies enter wild forest areas because cheap land is abundant. They build camps and roads through the forests, hunt large and often endangered animals for food or pay impoverished indigenous people to kill bushmeat. Not only is this an unsustainable way for the loggers to live, but the villagers who stay behind after the companies leave continue this pattern of consumption. In addition, farmers who were forced farther away from towns by growing village populations,

expand along the roads that the loggers have built, roads which provide access to areas once inaccessible. Even if the animals were not killed in these areas outright, their habitats are being destroyed. Tropical forests often contain many species which are very vulnerable even to minute changes in their environments, such as temperature variations.

With less land, dwindling animal populations become divided, and individuals become weaker and more susceptible to disease. This process is a negative feedback cycle that results in the "phenomenon of the empty forest," which both Dr. Goodall and Dr. Pimm recounted is sadly becoming more and more common. "Empty forests" still have trees and other plants and seem intact from a superficial examination. However, from a closer look (or listen!) subtle differences, such as a distinct lack of bird, monkey, and even insect calls, prove that these forests are not healthy. In addition, when the species that keep the forest ecosystem functioning are gone, the trees are more vulnerable to fires and other damage.

At the same time, village populations are growing. Robert Engelman, vice president for research at Population Action International, remarked that "human beings are drawn to the same areas on the planet that attract other life." Fifty years ago, 28 percent of the world's population resided in the tropics, but since then, about half of all human population growth has occurred in the tropics, where most hotspots are also located. Human population growth in and around hotspots is occurring at 3.1 percent annually – more than twice the world's average population growth rate. Population growth in these areas reflects in-migration and cultural preferences for large families to some extent, but mostly it reflects the lack of family planning facilities and access to contraception that would allow individual couples to choose family size. As further evidence of the pressures from increasing population, villagers tell stories of farmers who attempt to farm on extremely steep land (often, the only land available that is not protected), only to fall off their own fields and injure themselves. By butting right up against the wild areas, they are also coming into more contact with wildlife, exposing them to a greater risk of disease.

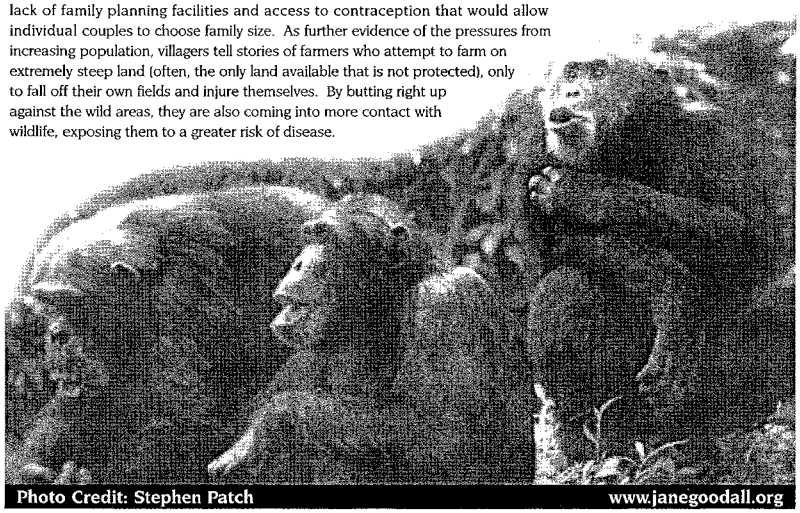

Photo Credit: Stephen Patch www.janegoodall.org

THE IMPORTANCE OF WILDLIFE

Many species, some of which are not yet identified, are becoming endangered or extinct. Not only is a healthy natural world needed in order to maintain the balance of life on earth, but animal species are needed to teach us humans volumes about ourselves. Dr. Jane Goodall's extensive observations of wild chimpanzees have done just that. "We used to think there was a sharp line with humans on the one side and the rest of the animal kingdom on the other. Our research has shown so clearly that this line is blurred," stated Dr. Goodall. For example, chimpanzees can form abstract symbols when communicating, live within complex social groups, and amazingly, can make tools. Interestingly, chimpanzees also show the same emotions as humans, in the same context. After being separated for a time, friendly chimpanzees will pat each other on the back, and even kiss and hug each other. When a chimpanzee dies, they show sadness and grief. Strikingly like humans, they also demonstrate aggressive and violent behavior toward unfriendly chimp groups. Dr. Goodall emphasized that understanding them "leads to a new respect – not only for the chimpanzees, but for so many of the other amazing beings on this planet. And so it is a tragedy that they are disappearing in the wild. It's so desperately important that we try to save these forests and the amazing beings who live in them."

"We used to think there was a sharp line with humans on the one side and the rest of the animal kingdom on the other. Our research has shown so clearly that this line is blurred."
– Dr. Jane Goodall

Chimpanzee, great ape, and monkey populations have all decreased dramatically in recent years. Currently, it is estimated that there are only 150,000 chimpanzees, down from approximately one to two million at the beginning of the last century. Robert Engelman, who tracks human population growth in wilderness areas, has found that some of the highest population growth is occurring around the Ghanaian forest hotspot and the Congo basin, where sub-populations of chimpanzees also live.

HIV AS A ZOONOSIS

Clearly, chimpanzees have taught scientists much about HIV, and more can be learned. Dr. Beatrice Hahn and Dr. George M. Shaw, along with a team of scientists, have studied Simian Immunodeficiency Viruses (SIVs), in an effort to determine the origin of HIV/AIDS. There are two main types of this disease in humans: HIV-1, which is the disease that has spread throughout the world; and HIV-2, which has remained confined to people in a relatively small region of West Central Africa. The earliest known case of HIV-1 was identified in a 1959 blood sample, although Hahn and others think that humans probably contracted it at other times earlier in the century. In fact, they have determined that no less than ten distinct instances occurred where either HIV-1 or HIV-2 was introduced to humans. Through painstaking molecular analysis and a comparison of the various types of SIV to HIV, Dr. Hahn's team discovered that HIV-1 derived from chimpanzees in the West Central African region, and HIV-2 stemmed from sooty mangabeys in this same region. Two additional factors support this conclusion – geographic coincidence and the existence of plausible routes of transmission.

While many local people do keep monkeys as pets, the most likely source of HIV has been through contact with primates' blood via the bushmeat trade. Thus, in order to better quantify the level of the threat of HIV from bushmeat, an international group of scientists and conservationists joined together in cooperation with the Cameroon government to complete a survey of primate bushmeat. At least thirty different species of primates are natural hosts of SIV, and although they carry the virus, it does not make them sick. Of the sixteen

species of primates they examined, thirteen were infected, each with a distinct form of SIV. In all, 20 percent of the 800 primates sampled were infected with SIV. This is shocking, according to Hahn, especially since humans are still killing and eating these very animals. "It is a public health concern that additional virus strains not detectable by current blood tests for HIV could infect humans and go unrecognized," Dr. Hahn adds. Of course, not all of these viruses may be able to jump species, and since humans have hunted for a long time but only recently contracted the disease, probably only the individual is affected in most instances when humans are exposed to forms of SIV. However, Dr. Hahn summarized the issue stating, "The bushmeat trade is not only driving chimpanzees to extinction, not only exposing humans to other SIVs and, likely, a variety of other pathogens, but it's wiping out the very species that could lead to a fuller understanding of HIV/AIDS."

POSSIBLE SOLUTIONS

So what can individuals, non-profit organizations, and governments do to relieve population pressures and eliminate the bushmeat trade, both of which have adverse impacts to biodiversity and human public health? The panelists addressed several possibilities. Engelman explained that future unbridled population growth which impacts biodiversity "is not just a given... there is a lot that governments, in particular, can do to bring that growth to an end, based on the childbearing choices of couples and individuals, by mid-century." A number of nations took an encouraging step forward by participating in a conference on population and development in Cairo in 1994, the goal of which was to make family planning and related health services available to everyone. The ability of governments, including the United States, to follow through with the agreements they reached at that conference, will greatly affect the future of population growth.

On a smaller scale, a number of governments are also making progress. For example, the Ugandan government recently instituted a new policy, which distributes a share of the nation's ecotourism revenue to local committees (which must include women) to be spent in their communities. One of the committees, for example, decided to use the money to build a family planning health clinic. Engelman summarized the strategy for achieving an environmental balance, "Meeting the health and childbearing needs of women puts us in a position where we're most likely to end up with population growth rates that are conducive to saving biodiversity around the world and the human well-being that it supports, by the end of this century."

Dr. Pimm suggested that with a relatively small investment of five billion dollars, an amount certainly manageable for the United States and other wealthy nations, logging leases in endangered hotspots could be bought out. Currently, a number of governments encourage the purchasing of logging rights by conservation organizations.

Education is one of the most important methods of protecting the natural environment. "Project PRESICA," a medical project of Cameroonian scientists and government ministries, aims to educate people to avoid bushmeat if there is a choice. "There is a political will, but it needs more: help from us, resources, and alternatives," reasoned Dr. Hahn. Dr. Goodall furthered this sentiment, "The fact that around the world, more and more people are becoming aware of the plight of our closest living relative, the chimpanzee, is a sign of hope."

As Dr. Pimm stated, "When things become personal, we care about them." Until then, people often do not take notice of human's interaction with the environment. Unfortunately, AIDS is one result of human carelessness with respect to the environment that has become all too personal for many communities. Through experiences with HIV/AIDS, humans may come to see that life on earth is interdependent, and that humans are not excluded. Humans are now at last expending the resources to understand how their actions resulted in the AIDS epidemic, and taking steps to halt the harm being inflicted on endangered species in the world's forests. If this is not done, Dr. Goodall described a foreboding situation: "Animals that are endangered will be gone, like the great apes. Animals that are threatened today will be endangered. Animals that today are common will be threatened. And so it goes on until the forests are left silent and dead." Humans must recognize that if we do not work together for these common goals, we will ultimately jeopardize ourselves.

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"The bushmeat trade is not only driving chimpanzees to extinction, not only exposing humans to other SIVs and, likely, a variety of other pathogens, but it's wiping out the very species that could lead to a fuller understanding of HIV/AIDS."
– Dr. Beatrice Hahn

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Special thanks to an anonymous foundation and Population Action International for their support of this briefing.

[The article "Warfare on gorillas poses threat to survival" submitted for the record follows:]

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Health & Science

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Warfare on gorillas poses threat to survival

By Tim Friend, USA TODAY

First come loggers into the remotest regions once known as "darkest Africa." Loggers build roads. Next come trucks loaded with armed men paid by businessmen to kill everything in sight. The meat of everything from small game to monkeys and even rodents is in high demand back the cities. But the big money is in Western lowland gorillas, which are prized by restaurateurs and wealthy patrons who regard gorilla meat as a symbol of status and power.

Read more below

Video

- Bronz Zoo trying to help end poaching of gorillas

Business couldn't be better. Indeed, poaching in the once remote regions of Cameroon, Central African Republic, Equatorial Guinea, Gabon and Republic of Congo has become the most immediate threat to the survival of lowland gorillas.

"We're not talking about starving villagers needing meat," says Peter Walsh, a field researcher with the Wildlife Conservation Society (WCS) and a visiting research fellow at Princeton University's Department of Ecology and Evolutionary Biology. "This is heavily organized commercial poaching where money is the motivation."

Walsh says if nothing is done now, the gorillas will be gone within two years.

But the conservation society is acting now. Tomorrow, the WCS, which operates the Bronx Zoo in New York, will begin

Bushmeat trade's impact

- Congo (Brazzaville) showed 5-7% of chimpanzee and gorilla populations were killed each year.
- In Equatorial Guinea, one monkey — the crowned geunon — is being hunted at 28 times the sustainable level.
- A 12-month study in Brazzaville counted 15,000 animal carcasses at bushmeat markets, including 293 chimpanzees.
- Some estimates suggest that several thousand apes are killed every year across West and Central Africa.

channeling admissions paid to visit its gorilla exhibit through July toward anti-poaching efforts in problem areas of Africa, says Richard Lattis, senior vice president and general director of WCS' Living Institutions. The Bronx Zoo operates the largest gorilla habitat in the world. Its star attraction is Pattycake, a 30-year-old lowland gorilla.

"Pattycake can be a symbol for what we now recognize as a crisis with gorillas in the wild," Lattis says. He estimates that several hundred thousand dollars will be raised.

- The bushmeat trade is a global problem, affecting primates, and other protected species in Asia and South/Central America as well as Africa.

- A conservationist in Yaounde, Cameroon, estimated that one metric ton of smoked bushmeat was unloaded at the railway station everyday, to supply the bushmeat markets.

Source: "African Bushmeat Trade — A recipe for extinction," by the Ape Alliance.

Based on surveys made over the past 10 years, experts estimate that about 100,000 lowland gorillas currently live in groups in the former remote regions. No one is certain how many are being killed, but experts agree the number is in the thousands per year, says WCS' Mike Fay, who spent nearly two years trekking through the densest jungles of central Africa.

Throughout his journey, Fay witnessed the intrusion of logging companies followed by poachers into areas where few humans had gone. In one dramatic moment captured last year on a National Geographic documentary, Fay confronted armed poachers and intimidated them into leaving even though he carried only a walking stick.

"If you look back 15 years, we didn't have any idea where the gorillas were in central West Africa or how many there were. But we've come to realize that, in particular, Congo, Gabon and East Cameroon have large populations," Fay says. "Simultaneously, we're looking at unprecedented logging in these same areas and that is opening access to people."

Fay and other experts estimate that thousands of gorillas are killed each year for their meat. But the extent of the poaching problem was not truly appreciated until a meeting last month in Germany of the world's leading experts on this most abundant gorilla species. During discussions at the meeting, field researchers like Walsh and Fay discovered they were all facing the same problems with poaching even though they work hundreds of miles apart.

Until that meeting, the conservation community overall believed that habitat loss was the greatest threat to the survival of lowland gorillas, Weber says.

Walsh says conservation groups such as the WCS and World Wildlife Fund, and their donors, have been concentrating resources on protecting the land rather the animals. But, he says, that is about to change.

"What we have discovered is that there is a mismatch between what we see on the ground and with what the conservation community has been occupied with for the past 15 years," says Walsh. "The focus has been on community-based conservation and working with local people. But this is a region where there are not that many people at all. Half the money from our groups should not be going into these types of programs."

While habitat loss is still a serious issue, what is needed now is law enforcement, Walsh and other leading experts say. Most of the countries already have laws banning poaching, but there's no one to enforce them. Walsh says the main reason law enforcement has been largely ignored is that the people who work on conservation as a life passion tend to prefer social programs for solutions to the many problems facing Africa's wildlife.

"International donors are really shy about getting into anti-poaching activities because you involve the military and people get shot," Walsh says. "It's much more warm and fuzzy to talk about conservation and communities. But law enforcement is the bedrock of conservation, and until everybody in the international community understands this, the poachers are going to keep coming."

In part, the money raised from the Bronx Zoo gorilla exhibit will be used to train and outfit game wardens in the problem areas of Africa, WCS officials say.

Some wildlife experts have been campaigning against poaching for bushmeat for the last several years, including Jane Goodall, who has testified on the problem before Congress. Bushmeat refers to all wild game, from rodents to chimpanzees, that are being hunted illegally and sold in markets as food. But the campaigns have not been effective until more recently, says Heather Eves, director of the Bushmeat Crisis Task Force in Silver Spring, Md.

The problem may be gaining attention. Rep. Wayne Gilchrist, R-Md., is holding hearings July 11 on the bushmeat crisis. Eves and other experts are expected to testify. The WCS holds a press conference on the plight of lowland gorillas Tuesday.

The U.S. Fish and Wildlife Service also is assisting conservation groups and working with governments in other countries to train new game wardens to enforce existing laws in protected areas.

Bill Weber, a gorilla expert at the WCS in New York and co-author with wife Amy Veder of *In the Kingdom of the Gorillas: Fragile Species in a Dangerous Land* ($27.50, Simon & Schuster), says resources are being shifted to support law enforcement. But he says groups should not stop working with the local communities.

"These are not all horrible, awful people who are eating these gorillas," Weber says. "They coexisted for thousands of years, but the equation has changed phenomenally. Now we have growing human populations, shrinking forests, and roads cutting into the heart of the forests. Bushmeat satisfies a large and growing urban population that has retained a preference for the wild meat it grew up with. Gorillas were a traditional food source. We're not trying to turn everyone in the African forest into vegetarians. But we would like to see gorillas and chimpanzees removed from the dining table. One way is to enforce existing laws."

Weber says blame also should not be put on the African governments for the lack of law enforcement.

"These governments have a lot of other priorities, and some continue to have very serious problems with security and outright warfare. Protecting wildlife is not at the top of their priority list. Generating resources from our own deep bank accounts would help. We have to remember we're the ones with the resources and the interest in this right now."

[A statement submitted for the record by Reginald Hoyt, Senior Vice President, Conservation and Science, Philadelphia Zoo, follows:]

Statement of Reginald Hoyt, Senior Vice President, Conservation & Science, Philadelphia Zoo

Introduction:

This testimony was prepared to respond to the questions of the Chairman that were directed to panelists on 11 July, concerning conservation activities in Liberia, West Africa. Liberia has been recognized as a global conservation priority as it retains nearly 40% of its lowland tropical rainforest intact. These forests represent the largest remaining tracts of the Upper Guinea Forest block that once covered much of West Africa (Togo to Sierra Leone). Home to forest elephants, the pygmy hippopotamus, a host of primates (including the chimpanzee, Diana monkey, red colobus and black and white colobus), and seven species of antelope (including the Jentink's and zebra duikers, which are unique to West Africa) Liberia represents the best chance for the long-term survival of many species of conservation concern.

Unfortunately, Liberia was embroiled in a violent civil war that lasted from 1989 to 1997. This war resulted in 40% of the population being either killed or made refugees before it was to end. To this day, political and economic instability plague conservation efforts in Liberia.

The Philadelphia Zoo's One With Nature conservation program has been working with Liberia partners since 1992. Given that the civil conflict in Liberia did not subside until 1997, our earlier efforts focused on maintaining the capacity to conduct conservation activities within the country via stipend support to professional staff within the Forestry Development Authority and the Society for the Conservation of Nature of Liberia. In addition, in-kind donations of uniforms, office equipment and a used vehicle were made. From 1997–1999 the Zoo focused its attention on assessments that evaluated the condition of Sapo National Park or data collection concerning species of conservation concern. It was not until 2000, that our efforts came to focus on the harvest and commercial use of wildlife.

Problem Outline and the Philadelphia zoo's work in Liberia:

A conservation assessment conducted in 1997 via a grant from the Philadelphia Zoo found that Liberia's only national park, Sapo National Park, had survived the civil conflict intact and that it appeared that wildlife populations had actually thrived during the war. While bushmeat harvest has been a long-term problem in Liberia, with an estimated value of $47,000,000 prior to the war, the ferocity of the fighting within the region adjacent to Sapo National Park had resulted in much of

the population becoming refugees. Those that remained lacked the equipment (guns or shot) or materials (wire for cable snares) to continue to harvest wildlife with any efficiency, so during the conflict wildlife populations rebounded. But with much of post-war Liberia, things were to change rapidly.

In economic collapse and led by Charles Taylor, the former warlord who began the conflict in 1989, Liberia is currently listed among the poorest countries in the world. The desire for economic growth have led to a "gold rush" like approach to resource utilization in Liberia, with timber extraction being among the most obvious. With the arrival of Oriental Timber Company in Liberia in 1999 the destruction of Liberia's forest reserves has proceeded at an alarming rate.

The construction of logging roads has fragmented the Krahn–Bassa National Forest, providing access for settlers, who practice slash and burn agriculture, and hunters. While the road networks continue to expand, impacting nearly all of the remaining forest blocks in Liberia, people in need of work (unemployment estimated at 85%) turn to the only sources of income they know. Those who returned from refugee camps to their homes in Liberia's towns and cities found no work. Over the years many of them have turned to Liberia's natural resources as a source of income. Some have found work in logging or mining, while a growing number have turned to the harvest of wildlife.

In 1997, we found very little commercial bushmeat hunting in those areas adjacent to Liberia's forest reserves in Sinoe County. However, during a survey of the Cestos River in 1999, our team discovered a nearly "empty forest" where we found few antelope. We discovered that hunters from a near-by logging camp were setting between 150 and 300 wire snares each per night. With much of the meat rotting in the forest, since 150 snares are far too many to efficiently manage, local villagers were angry and routinely destroyed the snares of the loggers. But every night we heard gunfire as hunters "called" in duikers to be shot.

Unlike the testimonies presented by our colleagues representing the situation in Central Africa, primates were not the primary targets of hunters in 1999. At the time antelope were plentiful, having been given a reprieve from hunting during the war years. With gun shot costing nearly $2 per cartridge, and antelope representing a larger and easier killed prey, primates were not heavily hunted. However, should antelope populations decline, a switch to primates could be expected.

In 2000, the Philadelphia Zoo working with its Liberian partners conducted a hunter survey to better understand the distribution of selected animals of concern. During that survey hunters requested posters that would show them which species were protected by law, and complained that the government was not doing enough to protect the forest or the wildlife resources of Liberia. During that same year, to improve communications between conservationists and communities, the Zoo founded its "Community Relations Officer" program in the area adjacent to Sapo National Park. In addition to public awareness and the facilitation of communications, the duties of the position included the collection of data on bushmeat activities in the region.

Since the founding of this program we have seen dramatic shifts in the pressure on wildlife. In 2000, to meet financial needs, villagers were selling one half of all large animals killed by the handful of snares set by a hunter. By 2002 hunters were only retaining the heads and entrails for their family's protein needs. Everything else is being sold to merchants who transport the meat to Monrovia. Becoming more and more organized, traders are now requesting large antelope, as it will bring them greater profit. In addition, villagers complain that "outsiders" from the cities have begun hunting within their tribal lands. While local hunters typically use 25–35 wire snares, these "commercial hunters" often set more than 150 snares. Data shows that when these large-scale hunting operations begin, everyone's hunting success per unit effort declines.

In an effort to better understand the bushmeat trade in Liberia, the Philadelphia Zoo developed an Urban Public Opinion and Bushmeat Survey that was conducted earlier this year in eight communities throughout Liberia with funding from the Conservation Endowment Fund of the American Zoo and Aquarium Association. The survey engaged 20 Liberian students in the effort, and was coordinated through several partner organizations in Liberia. The more than 2,300 interviews that were conducted are providing insights into the beliefs of the Liberian public, and the bushmeat market. Data analysis continues, as does work on the next phase of our bushmeat initiative. In 2003, the Zoo will again partner with Liberians to conduct a Rural Public Opinion and Bushmeat Survey (funded by the Critical Ecosystem Partnership Fund managed by Conservation International) in five forested regions of the country so that we can better understand the viewpoint of rural villagers.

To address the requests of hunters surveyed in 2000, the Zoo has produced a poster of "Liberia's Protected Wildlife" and distributed 5,000 during the Urban Public

Opinion and Bushmeat Survey. Currently, our partners in Liberia are conducting a Pilot Public Awareness Campaign, so that we may evaluate various media and its effectiveness in transmitting conservation messages to the public. In 2003, a National Public Awareness Campaign will take advantage of what we will have learned from the Pilot Campaign, and will focus efforts on addressing Liberia's pressing environmental issues. This Campaign will also be funded by a grant from the Critical Ecosystem Partnership Fund.

Today the Philadelphia Zoo is taking the lead role in addressing the bushmeat crisis in Liberia, by conducting research and coordinating the activities of our Liberian partners. The goal of our work in Liberia is to identify the causes and aggravating activities that drive the bushmeat market. While we do not have figures on how many animals are killed annually, nor on how much money this extractive industry produces each year, it is clear that the bushmeat trade in Liberia is growing rapidly and that numerous species are already being harvested unsustainably. Further, it is clear that Liberia's bushmeat industry is not restricted to its boundaries, and that this environmental crisis must be addressed on at least a regional if not global level.

Finally, I must point out that the "Bushmeat Crisis" is not the creation of international conservation organizations. Our work demonstrates that Liberians recognize the need for the management of their natural resources. Some communities have even attempted to stop bushmeat hunting as they see it as a serious threat to their wildlife resources, but there is a lack of capacity at all levels of society to deal with the challenges.

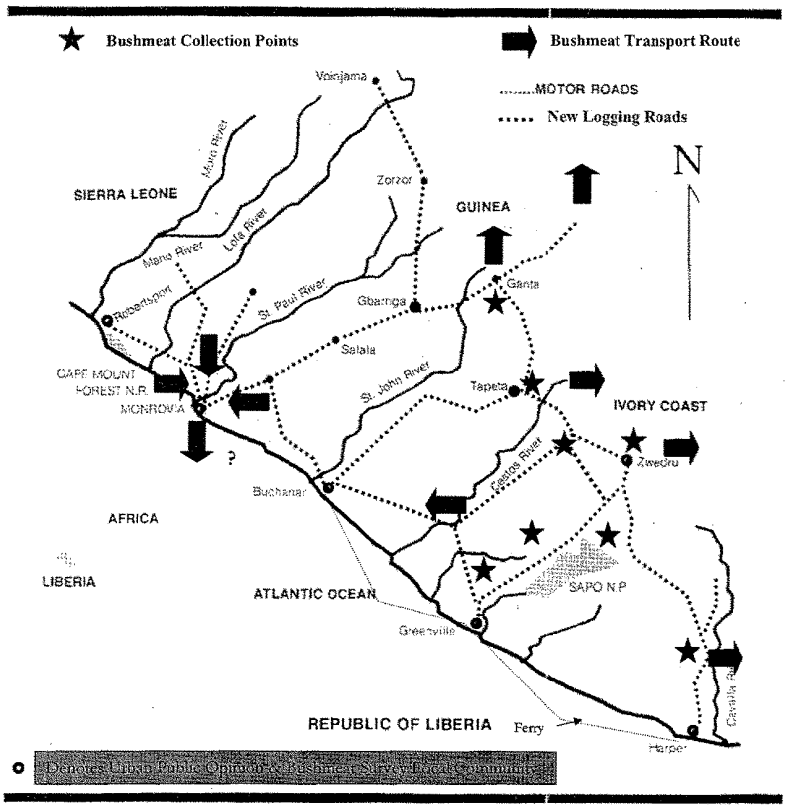
Financial commitment to conservation in Liberia

During the decade that the Philadelphia Zoo has worked in Liberia our efforts have been primarily funded by donations from our membership. Grants have been difficult to acquire due to the political instability of the region, but we have remained committed. While the Zoo has received funding recently from the American Zoo and Aquarium Association and from the Critical Ecosystem Partnership Fund, and our colleagues have received support from the World Bank and a handful of European organizations, funding has been lacking for conservation in West Africa. While testimony given on 11 July indicated that $12,000,000 a year was being spent on conservation in Central Africa, all of West Africa receives considerably less than $1,000,000 in financial support annually. As a global conservation priority, West Africa should be given greater financial support to meet the threat of habitat loss and the bushmeat crisis. This support can also be used to leverage development and good governance efforts in the region.

Recommendations

1. USAID, USFWS, and the State Department work together with US-based conservation organizations to support conservation priorities in Liberia and West Africa
2. USAID funds currently being withheld in Liberia be released to address projects that meet both development and conservation goals
3. US work with the EU and others to develop stronger financial support to address the bushmeat crisis in West Africa
4. Congress support efforts of US-based organizations to improve forest and wildlife management and conservation in West Africa
5. Recognize that development and conservation are not mutually exclusive, and support partnerships that promote sustainable economic development that is also compatible with the conservation of natural resources for the betterment of future generations of West Africans

We appreciate the Committee's attention to this issue, and hope that our testimony will be of service. Additional information is available upon request.

[An attachment to Mr. Hoyt's statement follows

Bushmeat Collection Sites and Transportation Routes Identified During the Philadelphia Zoo 2002 Urban Public Opinion and Bushmeat Survey