TESTIMONY

OF

DR. MICHAEL HUTCHINS
DIRECTOR/WILLIAM CONWAY CHAIR
DEPARTMENT OF CONSERVATION AND SCIENCE
AMERICAN ZOO AND AQUARIUM ASSOCIATION
and
CO-CHAIR OF THE BUSHMEAT CRISIS TASK FORCE

On behalf of the

BUSHMEAT CRISIS TASK FORCE

Before the

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS

COMMITTEE ON RESOURCES

U.S. HOUSE OF REPRESENTATIVES

On

THE BUSHMEAT TRADE IN AFRCIA

11 July 2002

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 US 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.
[de1]
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 US 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. [de2]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 US 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
Elizabeth Bennett, WCS
Russ Mittermeier, CI
Richard Carroll, WWF
Katie Frohardt, AWF
Janette Wallis, ASP
Christina Ellis, JGI
Reg Hoyt, Philadelphia Zoo
Rebecca Rose, Columbus Zoo
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/km^2, 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 US 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 continue, 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 km^2 – 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 neighbouring 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.

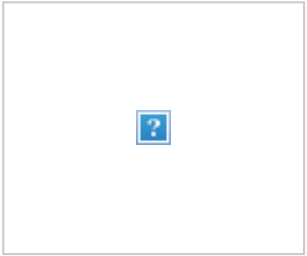
§ There has been international call for companies to boycott Central African tantalum, which is the easiest and safest corporate option, particularly in terms of public relations. There is no need to purchase Congolese coltan at present due to large inventories still being used up after the panic-buying 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 fuelling a war which has resulted in over 3m 'excess deaths' in 3 years.



Karen T. Hayes, B.A. Mod. Zoo, M.B.A. Cantab.

Corporate Affairs, Fauna & Flora International
Great Eastern House, Tenison Road, Cambridge, CB1 2TT, UK
tel: +44 (0)1223 571000 mobile: +44 (0)7968 179951 fax: +44 (0)1223 461481
www.fauna-flora.org

4 July 2002
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 alternative 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 US 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 US 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/km^2, 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 relationships 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.

[de1]Cut? Since John Robinson is speaking, we may not need this.
[de2]Cut?