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Bushmeat Hunting and Wildlife Declines in West Africa

Introduction:

In developing countries the use of wild animals for food, the bushmeat trade, is a multibillion dollar business that has greatly reduced wild animal populations. Ghana is a small, relatively prosperous developing country in West Africa with a population of only 20 million, and yet it takes at least 400,000 tons of animal meat out of the wild each year.

Justin Brashares and his colleagues counted the amounts and types of mammals recorded over the years in Ghana's nature reserves and found that there has been a 76 percent decline from 1970 to 1998, with local extinctions occurring in many locations¹. In addition to counting the animals the authors looked at the economics of the bushmeat trade and discovered a connection between it and fish supplies. Fish provides a large majority of the animal protein for Ghanians, but when fish supplies falter and fish becomes expensive, bushmeat hunting increases. Conversely when fish prices go down so does hunting pressure on wildlife.

The offshore fishing industry in West Africa is largely unregulated and supports a large distant-water fleet from European Union countries, and a substantial amount of pirate fishing. The EU subsidized their fishing fleet with over \$350 million in 2001 alone,

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artificially increasing the profitability of fishing in West African waters despite declining fish stocks. The EU could help relieve the economic pressure driving the bushmeat trade by changing the way they exploit and manage marine resources in West African waters.

Another approach to reducing the bushmeat trade is to improve farming practices in the tropics to help feed the growing and rapidly urbanizing population.

We spoke with Justin Brashares about his conservation work in Africa.

ER: Professor Brashares, what is your background?

JB: I'm an assistant professor of wildlife ecology and conservation in the

Environmental Science Department at the University of California, Berkeley. One of the central goals of our department is to train students to have both a strong science background and knowledge of the policy and social dimensions of natural resource conservation.

I grew up in the Washington, D.C. area. In 1991 after my sophomore year of college I traveled to Kenya where I studied wildlife ecology and management for four months and then stayed to teach these topics for another eight months, and it was a life-changing experience for me. When I returned to college I switched my major from creative writing to biology. I also started searching for graduate programs that would allow me to study conservation and wildlife ecology in Africa.

After two years of applications — amidst various menial jobs — I convinced a professor in the Wildlife Ecology Department at the University of Wisconsin to take me on as a Masters student. My research took me to Serengeti National Park in Tanzania, where I studied antelope ecology. In the Serengeti it was not unusual to lose our study animals to poachers. Seeing firsthand the pressure placed on wildlife by local communities living at the edge of poverty made me aware of some of our bigger conservation challenges.

In 1997 I moved to the University of British Columbia in Vancouver for my Ph.D. and soon after I began research in Ghana, West Africa. My work in Ghana started as a study of

antelope ecology, but it quickly turned into a broader look at long-term changes in wildlife populations and communities in savannas. To identify the factors responsible for dramatic declines in wildlife numbers, I looked more closely at the bushmeat trade in Ghana. I wanted to understand the consequences of hunting on wildlife. I also wanted to identify the social forces driving the wildlife trade in West Africa.

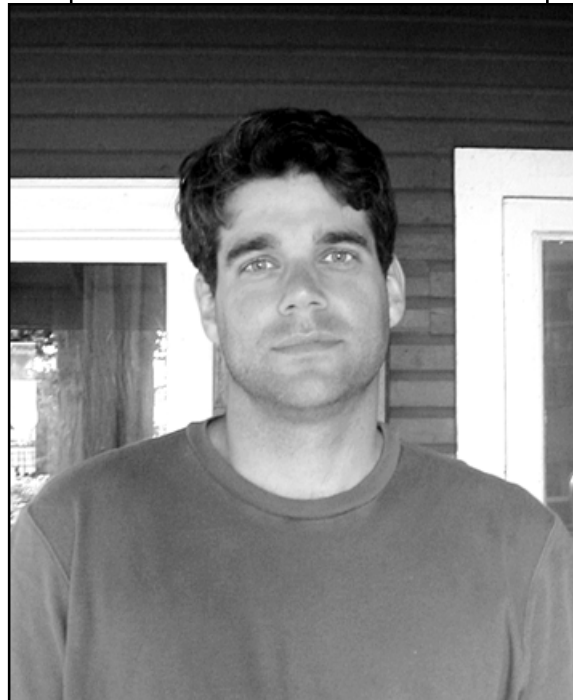
ER: Can you speak a little bit about your coauthors?

JB: The coauthor who probably has been most involved during the course of this project and since, is Moses Kofi Sam. Moses is now a fairly high-level employee of the Ghana Wildlife Division. This division is in charge of wildlife management and conservation in Ghana and they oversee the management of national parks and other protected areas.

Moses and I have never had any formal relationship, but during my first visit to Ghana in 1999 he took me under his wing and helped make things happen. The director of the division at the time wasn't always available, so Moses would write out my letters of introduction, which allowed me to travel around the country and gain access to parks and other places. It was also Moses among others who brought to my attention the existence of what I think is unusual and amazing long-term wildlife count data.

ER: Is he an ecologist?

JB: He is. Moses has a Bachelor's degree in Natural Resource Management and a Masters in Conservation Ecology from the Durrell Institute of Conservation and Ecology in the UK. Both in Tanzania and Ghana the



Justin Brashares is professor of wildlife ecology and conservation at University of California, Berkeley.

officials in the wildlife departments tend to have worked their way up from the lowest rungs of the ladder. Very often they started as junior guards, then rangers and then earned degrees while gradually working their way through the ranks. Moses is one of those people and he has worked on many projects, primarily elephant projects; he still gets into the field several times every month. Peter Arcese was my Ph.D.

supervisor at the University of British Columbia and he played a critical role as a collaborator and in securing funding for work in Tanzania and Ghana. Tony Sinclair was my postdoc advisor at the University of British Columbia and

Andrew Balmford was my postdoctoral host at the University of Cambridge. The last coauthor was Peter Coppolillo, an old friend and an inspirational advocate of conservation who works in Tanzania for the Wildlife Conservation Society.

ER: Tell us a bit about Ghana.

JB: Ghana is a small country in West Africa with around 20 million people. Most of the people live near the coast on the Atlantic Ocean on the Gulf of Guinea.

Ghana is an exciting place for many reasons. It's striking from a biogeographic perspective because of its sharp environmental gradient. In the south there are wet, rich west African tropical rainforests and lush coastal savannas, while up in the far north of the country, less than 300 miles from the forests, the land is sub-desert scrub.

ER: Is Ghana a former colony?

JB: It was a British colony, but the colonial history in Ghana is quite different than Tanzania or Kenya, which were also British colonies. My sense is the transition to independence in Ghana was smoother than in Tanzania and Kenya. I've been given the impression that the British were less heavy handed in West Africa as compared to East Africa; perhaps as a

result, there is less angst and resentment in West Africa compared to East.

ER: I was trying to get a sense of the institutional stability in Ghana. Kenya and Congo were a mess when the British got out. Is Ghana considered a developing country?

JB: It is a rapidly developing country. In many ways Ghana has become a poster child for democracy and development among the international aid community. For example, Bill Clinton visited Ghana during his tour of Africa and was a hero there; he remains a hero. You encounter many small children in Ghana named after him. I was told that the audience he drew for his speech in the capital, Accra, was the largest ever gathered voluntarily anywhere in the world at a public event in modern history. Almost a million people came to see him. I was in Accra at the time and it was unbelievable. The crowd swarmed to shake his hand after the speech and it was total pandemonium.

The reason why Ghana has in some ways been embraced as a model for the potential of African states is that it has remained relatively stable. It has had democracy and still does. I've spoken with Ghanaians who say I put too nice a glow on everything and that it's not always so peaceful and fair. Ghana has had its internal battles — suppression of free speech, ethnic struggles, political shenanigans — but nothing close to the Congo or Rwanda, or like what's happening in Ivory Coast right now, and certainly nothing close to Sierra Leone, which also isn't far away. Ghana has managed to be a stable democratic African nation, of which unfortunately there haven't been too many over the last thirty years.

One person who had an important role in the paper but who was not

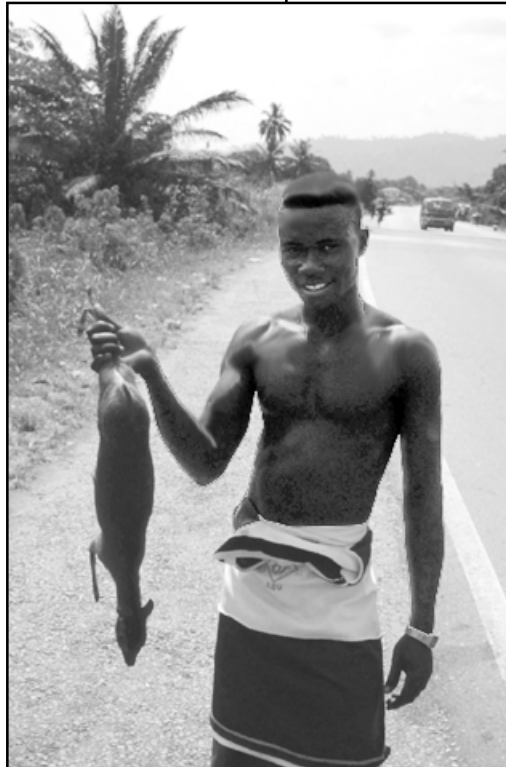
included as an author is Professor John Atta Mills. He's the former vice president of Ghana and he narrowly lost the presidential race last year. Professor Mills recognized the potential impacts of our research on European Union-Ghanaian relationships, particularly as they relate to fishing rights, which is a point of contention.

ER: Between the European Union and Ghana?

JB: Yes, and West Africa generally. Professor Mills and many others feel strongly that heavy fishing by commercial fleets coming down to West Africa from Europe has greatly diminished the amount of fish available to West Africans. He was the first to make me aware of this concern and he also alerted me to the dramatic fluctuations that occur in the fish supply in Ghana. As a politician, he had observed that shortages of fish led to economic, political and social problems throughout the region. This turned on a light bulb in my head and I immediately began my search for links between fish supply and people's reliance on bushmeat. Professor Mills' comments

sparked my pursuit of the social and economic drivers of the bushmeat trade.

ER: What is the bushmeat trade?



Red flanked duiker, a small antelope, is hunted for the table.

JB: The bushmeat trade is the harvest and sale of wildlife. It includes everything from elephants down through mammals of all different sizes and even reptiles, amphibians and insects. It occurs primarily in the tropics, but it's also a major source of food and income for people in places such as Mongolia, Central America, South America and many parts of southern Asia. It's considered by conservative estimates to be a multi-billion dollar industry that

provides a major, and in some cases perhaps the greatest, source of income for rural communities in developing countries. Bushmeat also is a great source of protein in the diets of people in developing areas of the world.

There are often two general perspectives presented on why people harvest and consume wildlife in these developing countries. The one view is that the harvest and consumption of bushmeat is linked directly to poverty, food supply and food security; that is, that bushmeat is hunted, consumed and sold by people who have few other

sources of income and typically have no other source of cheap animal protein.

The other perspective or argument is that bushmeat is more of a luxury market, more for an urban market; bushmeat is hunted in rural areas but it's going to urban areas and is sold there often at a higher price than other sources of meat.

The distinction between the two arguments is important for how we think about managing hunting and conserving wildlife. If bushmeat is an essential source of food and income for people living in poverty, then with aid and development and efforts to increase the opportunities for economic livelihoods for these people we might expect them to rely less on bushmeat. In other words we might expect there to be some positive consequence for biodiversity from economic development.

But if bushmeat is more of a cultural luxury item we would anticipate that increases in the spending power of people in developing countries will result in an increase in the harvest, sale and consumption of wildlife; that is, development will have a negative effect on conservation.

ER: Which way did your study go?

JB: First of all, we observed that bushmeat was an issue of great economic and social importance in Ghana, as it is in many parts of West Africa, Central Africa and other parts of the world. The scale of the harvest was striking; the amount of animals being harvested, sold and consumed in Ghana is on the order of hundreds of

thousands of kilos per year, all of this in a country smaller than the state of Oregon. Also, the magnitude of the role of bushmeat as a source of food and as a source of income was striking.

ER: How much of a villager's diet would it be?

JB: There are some areas where bushmeat comprises about 70 percent



Oribi, females shown here, are hunted extensively in Ghana for bushmeat.

of the animal protein in people's diets. It's difficult to assess the true importance of bushmeat for these communities because the trade and harvest are generally not monitored. In most places the trade is illegal, which makes it even more difficult to monitor.

ER: How did you start this inquiry?

JB: When I started working on bushmeat issues in Ghana, I wanted to understand both the causes and the consequences of the bushmeat trade; at first I concentrated on the consequences more than the causes. To start

I used the data on wildlife numbers that had been collected since the late 1960s.

I worked with Moses Sam and other people at the Ghana Wildlife Division to pull together whatever data we could find to build a record of wildlife numbers in Ghana's parks that covered almost three decades. Since many of these parks were formed in the late 1960s, I was able to look at changes in abundance over time using

these long-term estimates of forty-one different species of large mammals.

We saw that there have been many local extinctions — the regional extinction of a species — and overall, the abundance of mammals that would typically be included in the bushmeat trade has decreased by more than 70 percent in the last thirty years.

ER: Are people allowed to hunt in parks?

JB: No. There is a fair amount of hunting in

parks but it's not legal. There are certainly problems with enforcement and budgetary limitations for parks staff, but for the most part rangers are patrolling these parks and they're collecting data on wildlife and hunting. Generally I think it's fair to say of much of West Africa that there's great pressure on natural areas and insufficient resources to manage them.

ER: Are the parks the only source of bushmeat?

JB: Fortunately there's still a fair amount of certain types of wildlife outside of the parks. The situation

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outside of parks is what marine fisheries people describe as “fishing down the food chain”; that is, the larger more valuable animals were taken first until they were gone and then the next size class was targeted and so on. Today we don’t find many larger mammals outside of the parks and other protected areas.

ER: No elephants?

JB: No elephants, or at least not often. What you do tend to find are the survivors as I like to call them: the assemblage of species that for whatever reason are able to survive in the human-dominated landscapes.

For example, one amazing animal is the bushbuck, a strikingly marked antelope that is about sixty kilos in size. The bushbuck can thrive in a scrubby, somewhat degraded landscape, a mixed forest type landscape; it can live in a farm-scrub habitat. It’s almost like deer here in the U.S., both in its size and its ability to coexist with people. It does quite well by sneaking into agricultural patches or gardens at night, and it’s quite adept at hiding. It can find a single clump of bushes and hide right outside of a village and no one will be aware of it. I would call the bushbuck a survivor. It has managed to persist even though it is still hunted inside and outside protected areas. You can go to the capital city of Accra and see a bushbuck for sale on a roadside in this major city and it probably didn’t come from too far away.

Then there are lots of small antelopes. The red-flanked and black

duikers often are able to persist in human-dominated areas. Another example is the cane rat. It’s a large rodent that is one of the most preferred bushmeat items in West Africa. It often does well in these mixed forest-agricultural landscapes.

ER: What are some of the losers?

JB: The real losers are the big carnivores partly because they have a habit of getting in trouble with people whenever they leave a protected area. They are poisoned and shot and they’re also hunted for their meat and skins.

ER: Carnivores being lions?

JB: Carnivores being lions, leopards and spotted hyenas. Not long ago the African wild dog — now an endangered species — occurred widely throughout West Africa, but today it’s almost extinct in the region. All of the

large carnivores are poisoned and generally persecuted. They also require the kinds of habitat and prey base that tends not to occur in human-impacted areas.

Some of the primates and antelopes also require habitats and a freedom from disturbance that are not found outside protected areas. For example the black-and-white colobus monkey hasn’t done well outside protected areas. While there has been hunting in the protected savannas in Ghana there hasn’t been a huge amount of land conversion or habitat alteration so far, which is positive.

ER: Your *Science* paper looked at the effects of the bushmeat trade on wildlife conservation, and also on the

human side of it.

JB: There’s a process I’ve seen quite often with researchers working in sub-Saharan Africa where we start off with great ambitions of advancing our fields



Wildlife ranger with a water buck killed by bushmeat hunters.

through basic or pure research, but at some point we realize that our study is being affected profoundly by people and we're drawn into local communities to try to understand why. That's when we start to see the importance of humans in these ecosystems and the need for more applied research. That's the process I went through in Ghana, and I am convinced we cannot address any of these conservation challenges without addressing the human side of it. The bushmeat crisis will not be resolved using an approach focused only on the animals.

ER: What about the economic forces behind the bushmeat trade?

JB: Despite what I just said about the importance of bushmeat, fish are far and away the cheapest and the most important source of animal protein throughout Africa and throughout the developing world. My coauthors and I wanted to see how shortages of fish affect people's use of bushmeat, both for food and income. To do this, we compared annual estimates of wildlife abundance to the supply of fish in Ghana across about a thirty-year period. During years of below-average fish catches we found evidence of greater declines of wildlife

in the reserves, suggesting that there was a trade-off between fish and bushmeat, depending on the availability of fish. We felt that this correlation between fish supply and wildlife numbers provided pretty strong evidence that bushmeat was a substitute source of protein when fish was too expensive.



Jackal hide for sale. Large mammals are hunted out first, then smaller animals are taken.

Many colleagues challenged our interpretation of this correlation and pointed out other potential explanations for our results. It was clear that we needed to do a better job of characterizing this interaction of fish and bushmeat if we expected our results to stand up to close scrutiny.

ER: How did you follow up on that idea?

JB: Soon after I started work in Ghana in

1999 my colleagues and I began monitoring the sale of bushmeat in rural markets in several areas of the country. We looked at the amount of bushmeat in the markets, the rates at which it was selling and the prices. We also monitored the supply of fish in markets, and other domestic sources of meat.

We tried to collect those data ourselves with the help of two Ghana-

ian assistants who did most of the fieldwork. People trust those from their own community more readily than they do outsiders. Clearly in our market surveys, Ghanaians opened up to Ghanaian interviewers much more than they did Americans inquiring about the sale of an illegal good in their markets; that is, bushmeat. My coauthors and I also feel strongly that any research in a developing country must include the training and development of local scientists as one of its central objectives. So, it was important for us to hire and train Ghanaians to help with all aspects of the research including the market work.

ER: So the markets told the same story?

JB: Looking at twelve markets in rural areas in Ghana we saw patterns that strongly supported the correlation between fish and bushmeat that we had observed in the long-term data set. We observed that as the supply of fish in markets decreased, the price of fish increased and we saw an associated increase in the amount of bushmeat that was sold.

ER: Classic supply and demand.

JB: Whichever of the two was less expensive, be it fish or bushmeat, was purchased at the higher rate. And once fish was in short supply there was a dramatic increase in the supply of bushmeat in markets.

This isn't included in our *Science* paper but we interviewed quite a few bushmeat hunters and there was an increase in hunting rates of wildlife when the price of fish increased. Taken together, we felt we demonstrated that over the long term, food supply was a critical issue for conservation of wildlife: specifically, the supply of fish

dictated to a large extent pressure on wildlife on land.

If you go back to what I said about the two perspectives of the bushmeat crisis, luxury or necessity, I believe our study suggests that over the last three decades at least in rural areas of Ghana the necessity model is a better fit. I don't want to discount the other perspective either because there is an urban, luxury market for bushmeat as well, and it appears to be growing as urbanization accelerates. In Accra, Kumasi and other major cities of Ghana we consistently see the widespread sale of bushmeat, sometimes at prices similar to domestic sources of meat and sometimes more expensive, which suggests it's not an essential food item for city-dwellers.

ER: You can see the same thing in the U.S. We have buffalo, alligator, elk and deer in markets.

JB: I think the cultural tie to bushmeat is strong, particularly for West Africans and Central Africans. One of the future directions for my research is to monitor African bushmeat sales in North American markets (which is not legal). I'm assembling information on the volume of bushmeat coming into North America, who's buying it and why, and trying to understand this international, luxury aspect of the trade.

As a researcher and as a citizen trying to combat the bushmeat trade, I appreciate both the luxury and subsistence elements of the trade and accept that there are shades of gray between the two extremes. The African monkeys, antelope and rodents that show up in markets in New York, Chicago, San Francisco, Montreal, and Toronto clearly can't be described as being

JB: There is a medicinal component to bushmeat, though I would not put it at the same scale as some of the Asian traditions of wildlife use. It's not necessarily medical, but there's a long cultural tradition of the use of certain species for celebrations, rites of passage or other rituals. That seems to be how African wildlife is used when it's purchased outside Africa. It tends

to be purchased by African expatriates living in Europe or North America who buy it for special occasions or rites of passage. They're trying to hold on to an important aspect of their culture.

ER: What have been the effects on the wildlife populations in Ghana?

JB: The wildlife resource underlying the bushmeat trade has almost collapsed, it's probably less than 25 percent of what it was thirty years ago. Wildlife cannot support this rate of harvest and I think we need to see an increase in the supply of fish. But as



Large mammals such as these bush cows are hunted extensively for bushmeat. They are seldom if ever found outside protected areas.

essential for food supply or poverty alleviation in the United States, but at the same time the people doing the harvest of that wildlife back in the forests and savannas of Africa are often living in poverty. If a hunter has an opportunity to drive a taxi or work on a construction or aid project they'll stop hunting. Hunting is hard work, it's risky and it doesn't pay much. It doesn't take much of a job to turn an active hunter into a retired hunter.

ER: Is there a folk medicine component to bushmeat in Africa?

is widely noted, the decline of marine resources is probably equally catastrophic, and it's particularly true off the coast of West and Central Africa where there's been heavy exploitation of marine resources since at least the 1950s.

It was then that European countries began intensive, industrialized harvest of fisheries off West and Central Africa. That still goes on today, but the foreign exploitation is now being matched or exceeded by regional industrialized fleets.

ER: If you kicked out the Europeans then the Africans would take the same fish?

JB: That is what would probably happen. You'd see an increase in regional harvest. In the paper we propose some remedies or ways of approaching this problem.

Whatever marine resources are released from harvest if the European Union fleets leave West African or Central African waters could quickly be picked up by an increase in West African efforts or pirate fishing boats.

But at least that would provide over a short term more fish resources for West Africans and probably more income for West African countries. It would also take some time for West Africa to build up a fleet to make up for the loss of the European Union harvest.

Another big issue is that the marine harvest by distant water fleets in West Africa — for example boats from Portugal and Spain — is taken home for processing, so there isn't even a post-harvest economic benefit for West African countries. At least there would be an economic interest for West African countries if all boats were required to process their harvests within the region.

ER: One way to get some leverage with France or Portugal would be for Ghana to say, either work with us or leave our waters.

JB: True, but this is much easier said than done. It's a political and somewhat ugly realm of debate. Many NGOs working in West and Central Africa and

elsewhere, argue that developing countries like Ghana have one arm tied behind their back when trying to fight for their economic rights against industrial giants like the US and EU. Many international observers and African politicians contend that the European Union and other economic

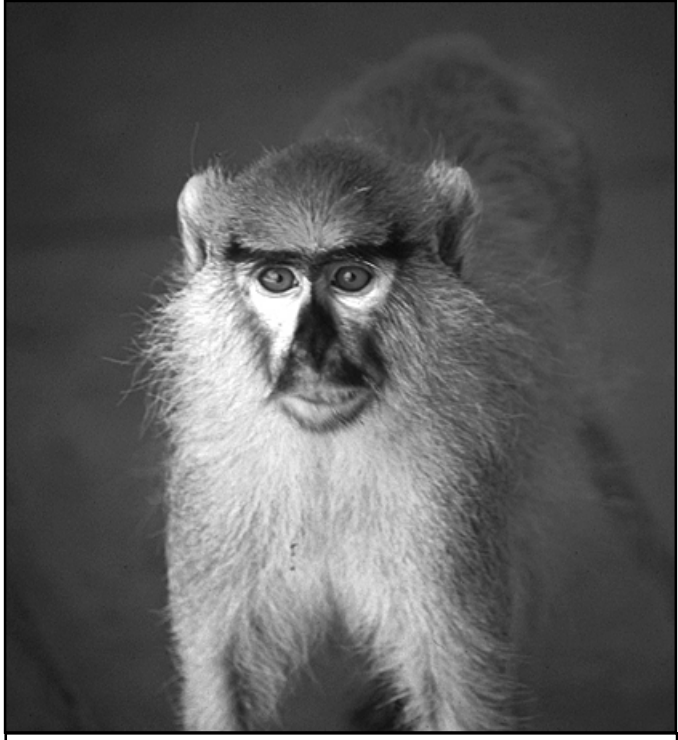
anyway and you have groups that are entitled to be fishing outside of that zone coming into the zone illegally. You also have a large amount of pirate fishing, which is becoming better documented in that region.

ER: Do we endanger anyone's life here by naming names?

JB: I couldn't if I wanted to. There's been some interesting writing on the pirate fishing issue and it's something the Worldwide Fund for Nature (WWF) and Greenpeace have taken on. The pirate fishers are coming from all over. In some places it's groups that are authorized to fish in one area, but when they're not catching much in that area they bring down their flags, hide their boat's name and head to an area where they know they're fishing illegally. The problem is they know also they will never be caught. When they make the move they become a pirate fishing vessel. Many of these boats can be registered to Caribbean Islands or other places where registry can be somewhat loosely obtained.

Groups like WWF and Greenpeace have tried to quantify the scale of pirate fishing through aerial photographs and it looks to be about equal to the number of large vessels that are fishing legally.

Both for the pirate fishing and also for the distant water fleets, there is a huge amount of by-catch. Up to 95 percent of the total catch is thrown overboard because it's less valuable than other fish. The European, Asian and regional commercial fleets are



Patas monkey. About one a day was sold for meat in three markets sampled in Kumasi in 1990 (FAO).

powerhouses unfairly tie fishing access or marine access rights to general aid or development assistance. For example, offers of debt relief from industrialized nations may be linked either implicitly or explicitly to access to a developing country's waters (Economic Exclusion Zone). There is the 100-mile Economic Exclusion Zone and then outside of that anybody can harvest fish, but if you have no policing of your economic zone then it tends not to be observed

primarily out there for tuna and that's what the pirate fishermen are after too, that's where they're going to get their biggest money. Many of the smaller fish, which incidentally are the major source of food for West Africans are simply discarded.

ER: Those are also the prey base for tuna.

JB: That's right. Conservative estimates from the FAO suggest that the tuna fishery is massively overexploited in that area, not to mention the impact on the other species.

ER: What are some of the remedies you're thinking about?

JB: One of the potential remedies is to increase alternative sources of animal protein that don't include wildlife. One way is to increase aquaculture and another is to increase livestock production. Both of those suggested remedies have resonated a great deal with FAO and World Bank. They and other organizations are working on aquaculture development and livestock enhancement already. But as a conservation scientist I'd have to have my head in the sand not to be aware of the negative consequences of aquaculture and livestock intensification. They present a whole new set of environmental and social problems, and bring on all of their own conservation issues.

ER: Is Ghana urbanizing?

JB: Ghana is urbanizing. The whole of sub-Saharan Africa is urbanizing, more and more people are moving to the cities.

ER: Concentrated agriculture seems to be the path that developed countries have taken. We've had our problems but we've got experience dealing with those.

JB: There is a lively debate about whether or not we should be looking



We cannot address these conservation challenges without addressing the human side of it.

for eco-friendly farming approaches that would spread the impact of farming on biodiversity over a wide area, versus intensification of agriculture that would impact biodiversity greatly but in a smaller total area.

One of my coauthors, Andrew Balmford, and his colleagues have modeled these different conservation scenarios and have argued eloquently that we should be intensifying small areas devoted to agriculture and working harder to preserve the rest. I think there can be great benefits to that approach, but I worry too that it requires a level of government regulation that is not yet realistic for most countries.

One of the things we want to say to the international community about the bushmeat issue is that we in the West

have hundreds of years of experience in increasing productivity of small farms; there must be more we can do to help these developing countries.

Agricultural intensification has another aspect in Ghana and West Africa generally because the region has become the cocoa producing capital of the world. A major source of income in West Africa is cocoa exports. Cocoa is similar to coffee in that it can be a shade crop, and like coffee, there are many initiatives to intensify the production of cocoa in ways that would enhance biodiversity in the cocoa production areas. It goes back to this same debate: do we use less area and maximize production, or do we use more area and keep it friendlier to nature?

ER: What do you think is the best thing to do in Ghana right now?

JB: There are lots of things that need to happen. First, the European Union has been in the forefront in addressing the bushmeat trade in Africa and Asia. The EU has drafted legislation to prohibit direct involvement of EU member states in the bushmeat trade or in any development activity that supports or exacerbates bushmeat harvests. There's much more awareness in Europe about the bushmeat crisis than there is in North America and in the United States.

Given the heavy involvement of the European Union's distant water fishing fleet off the coast of West Africa and the link between fish supply and bushmeat harvest, I think the EU has a great opportunity here to demonstrate its leadership by changing its policy of

fishing in African waters. I think in the short term the European Union has an opportunity here to be the good guys and to say, We realize, for economic and biodiversity reasons, that it would be a benefit to these parts of the world if we stopped fishing there. Even if the EU limited their subsidies of their foreign fleet it might change the economics enough so that it would no longer be economically attractive to the distant water fleet.

ER: Now you're talking hard-core politics.

JB: I understand it's a major request to ask the European Union to limit the activities of their distant water fleet because it is a big source of income. I imagine people in Europe will hate this suggestion. But it does seem like given the dedication the EU has shown towards addressing the bushmeat issue and towards addressing human poverty and food supply issues in Africa that action should be taken on the fisheries front.

That's not necessarily a long-term solution. The long-term solution is better management of fisheries and wildlife resources by individual nations and the international community. That's a great challenge that I don't think any country has met or addressed particularly well, including the U.S.

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- 2) More information about the bushmeat trade can be found online at www.fao.org



Red Sky at Morning:

Introduction:

The environmental movement has suffered a series of setbacks at the hands of the Bush Administration. In this winter of our discontent it is important to remember that liberal ideas in western society continue to be dominant, in theory if not always in practice. Liberal ideas, the primacy of the public interest over private interests, so thoroughly set the framework for our thinking about government that even the Bush Administration has to use the language of liberalism, with often comic effect. From Roosevelt's New Deal, through the activism of the 1950s, 60s and 70s the U.S. has undergone more positive social changes than at any time in our short history.

While the President dithers, people at the state and local levels are addressing the big environmental and social issues that are bearing down on us: global warming, social and economic equity, and conservation of ecosystems. These issues will increase in urgency with time and the longer our government refuses to deal with them, the more costly the solutions will be. Although no administration has been as hostile to the environment as Bush's, in fairness it should be noted no previous administration has dealt with global warming either.

Bush's ideological cohorts define themselves primarily by what they are not; that is, they are definitively not liberals, but since liberalism defines our political possibilities they have few ideas with which to work. Bush's support for teaching creationism in public schools, for example, is a combination of

political calculation and intellectual sloth.

Bush and his fellow travelers are trying to hold back a rising tide, but they cannot repeal the laws of physics. As the world becomes warmer, more populated, and ecosystems more stressed, we will have to be more intelligent in our economic and political choices, we will have to plan better, and we will have to manage natural systems far more than we have in the past. In this brave new world the advantage will accrue to those people and societies that plan and manage best. Conversely those who do not use care and foresight will only have force and violence to fall back on.

In the 1960s and 70s the federal government made a good start on environmental legislation and made substantial progress on air and water pollution, forest protection and public health. We spoke with Gus Speth about some of the history of environmental legislation and policy, in which he was actively involved, and what needs to be done next.

ER: Dean Speth, what is your background?

GS: I had three great years at Yale Law School and towards the end of that time I had a brainstorm: Why don't we create an environmental legal group modeled on the NAACP Legal Defense Fund? I got some fellow law students together, and we approached the Ford Foundation. We got initial funding from the Ford Foundation, and in the end it became The Natural Resources Defense Council. So I got into the environmental field due partly to my interest in environment and partly wanting to do something constructive with my law training. As it happens we got NRDC off the ground in 1970 at the

beginning of the most fertile period in the development of U.S. environmental law and policy.

Then, in 1977 I had the opportunity to go into the Carter Administration at the Council of Environmental Quality. While I was there we prepared the Global 2000 study, released in 1980.

That was when I realized we had spent ten years working hard on domestic issues, but internationally things were still going downhill. I realized that the biggest environmental problems were the more global, international ones.

When I left the Carter Administration, dismissed by the voters, I went to the McArthur Foundation, and they gave us the support to start the World Resources Institute, which has a focus on global-scale environmental issues. I had a wonderful decade doing that.

Then I went to the United Nations for six years as an administrator of the U.N. Development Programme, which was a marvelous opportunity to focus more on the global

poverty issue than the environmental issues, though we built many strong environmental programs when I was at UNDP.

Towards the end of that period I was approached by Yale to be the dean at the School of Forestry & Environmental Studies. Now it's been six years here as dean, and it's been an extraordinarily rewarding experience working with young people and with an interdisciplinary faculty. We have on the faculty ecologists, chemists and other natural scientists, but we also have anthropologists, economists, sociologists, lawyers and a number of other disciplines. It's about half and half between the social sciences and the natural sciences.

ER: That stretches the boundaries of what a school of forestry does.

GS: Yale's is the country's oldest forestry school; it started over 100 years ago. In the early 1970s the school had the foresight to begin to transform itself into a school of environmental studies and environmental management. Now the forestry part of the school is perhaps 20 percent, and 80 percent addresses a wide range of other environmental management challenges.

ER: There was a different worldview in the 1970s, more consensus about environmental issues. It seems like everybody was on board then, even President Nixon.

GS: It was an amazing period, everybody was on board. The journalists were intensely interested, with Walter Cronkite leading the charge. The public was concerned and involved. When the word went out that fluorocarbons in aerosol spray cans were damaging the ozone layer, there was a huge drop in

mental Quality was established. The business community was somewhat caught off guard. Things moved faster than they could oppose. I was trying many lawsuits during that time and taking cases to court one after the other, as were my colleagues at NRDC, and it was hard to lose.

What drove all of this was the fact that the environmental problems were so visibly apparent. They were acute issues. There were disgusting sights, disgusting water, disgusting air. There were plans to put roads through neighborhoods, to build power plants nearby, to strip mine and clearcut. These were easy targets because they were affecting people with noise and smells and risks and destruction, and the country's economy was so big that these were now not isolated things that you couldn't notice. The Santa Barbara oil spill was the straw that broke the camel's back of the status quo.

ER: What changed?

GS: I would say almost everything has changed, and I

don't think it has changed simply as a result of electing people hostile to the environment, though we have certainly done that. There have been many fundamental things going on. One is that our efforts worked. We cleaned up a lot of America, so the problems are not as much in your face anymore. The problems are in Indonesia, the problems are in the stratosphere, the problems are in the future and they're chronic, they're difficult to understand and difficult to see. Climate change is a perfect example. That's one part of the dynamic.

The issues of greatest concern today are more chronic and more difficult to understand, more remote in time and space and psychology

The major issues today are more chronic and more difficult to understand, and more remote...

their use and in the production of CFCs, voluntarily, even before there was any action under the Montreal Protocol.

The major effort at that time was to take environmental issues to Washington. The civil rights movement had shown that when the states were not going to respond adequately, if you wanted to get action on issues you had to go to Washington, so that's where we went.

Out of Washington came amazing bipartisan support for ten to twelve major pieces of environmental legislation. This was in the 1970s and we haven't seen anything like it either before or after. In 1970 EPA was established and the Council of Environ-

generally. At the same time things look better because we succeeded in meeting many of the original environmental objectives of the late sixties and early seventies.

I think another factor is that those in industry, who want to fight back are no longer caught off guard. They're well financed, they do huge public mis-education campaigns, they have vast lobbying forces with big campaign contributions and they are more sophisticated. When they want public relations ammunition, they fund conservative think tanks that are prepared to churn out the information they want.

In the meantime the environmental community has grown large and has become institutionalized. I'm not one who believes the environmental community has become ossified or lost its way or become bureaucratized, but the concern and the groups that represent that concern are now part of the mainstream American culture. The novelty has worn off.

In the meanwhile we have had a move to the right in the country. It's a basic shift that has affected a wide range of issues and the attitude about government. Market fundamentalism and a shift in perception about what Washington can do for the country has impacted a range of issues including the environment but by no means only the environment.

Finally there's been a politicization of the environmental field. You can track this in the voting charts of the League of Conservation Voters. Twenty-five years ago there was a difference between the parties, but it was not nearly as pronounced as it is now. In the 1970s we in the environmental community had a lot of bipartisan support. We're at the point now where it's hard to find a congressional Democrat without a good environmen-

tal record and hard to find a Republican with a good one. The split between the parties is now huge. All of this has combined to make the situation today fundamentally different from the 1970s.

ER: It seems like the stakes are higher now, if that is possible.

GS: As all of this has happened we're now faced with issues that are far more serious than the ones we tackled in the early seventies, in particular climate change. Global warming is an emergency, it's not something that's going to happen in the future, it's happening now and it's serious. Every day reports come out in *Science*, *Nature*, and *Geophysical Letters* and other journals with scary news about what's going on at the poles, about the impacts of warming on biological diversity and on ecosystem function and stability.

ER: Even if we stopped adding greenhouse gases today, global warming will continue just because of momentum.

GS: The Europeans are talking about trying to stabilize carbon dioxide levels that will allow the temperature not to exceed two additional degrees Celsius of global average warming. We've already added about 0.6 degrees Celsius, and we are committed to doubling this due to past actions. With two degrees of increase of the global average you're talking maybe four or six degrees at the poles; at that point you're talking about the Greenland ice sheet melting. When I talk to scientists they don't think that it's possible to call this uncontrolled experiment on the planet to a halt at 450 parts per million of carbon dioxide, which is about what you ought to associate with about two degrees global average. They think it's going to shoot right beyond that and

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talk about 550 ppm and more. So we are facing a huge threat and a huge challenge.

ER: What are the most serious challenges we have to deal with?

GS: We are faced with some serious challenges particularly with climate, and also biodiversity loss and declining water supplies in many areas. To me those are the three most dramatic challenges. Lest we get mired in these problems, I think the important thing to appreciate is what we can do about them.

ER: The states are starting to take action on climate change because the federal government won't. This is the reverse of what happened with the civil rights movement and the environmental movement of the 1970s.

GS: There are now close to thirty states that are putting in place measures that will help reduce greenhouse gas

emissions. Many states are enacting renewable energy portfolio goals. New York's goal is a 25 percent reduction of greenhouse gas emissions by 2015. This is a dramatic change. Other states, such as Connecticut, have greenhouse gas reduction goals for the state. The Connecticut goal is to reduce total greenhouse gas emissions 10 percent below the 1990 level by 2020. That goal has been endorsed by a number of northeast states, and these states are now developing a regional cap and trade program like the one in Europe. Other states are regulating carbon dioxide emissions from power plants, such as Massachusetts; at least one other state, California, is regulating carbon dioxide emissions from automobiles. *[Soon after this interview Governor Schwarzeneger announced an ambitious timetable to reduce California's carbon emissions. Ed.]*

We've got this encouraging array of things happening at the state level. The most important thing we can do now on climate is to get every state to adopt an automobile objective like California's; to regulate carbon emissions from power plants like some states are doing; to have a renewable energy portfolio goal like New York, and to have an overall state goal like Connecticut's.

Things are moving at the state level and at the local level in many places. That's extraordinary and it will eventually force Washington's hand. In fact, I think the whole position of the Bush Administration is so radically out of touch with reality that it will crumble in the not-to-distant future. When you have former Secretary of State James Baker and others saying we need to do something to protect climate, things are

changing in a major way politically. It looks like the last people to get the word will be those in the White House, but they will get the word pretty soon I think. The question will be whether they will do enough.

ER: Businesses need to plan and the administration's head-in-the-sand approach isn't helping most of them.

GS: Another encouraging thing that's happening is that many farsighted business leaders are seeing the handwriting on the wall. There are scores of companies now that are "voluntarily" reducing their greenhouse gas emissions. I'd put voluntarily in quotation marks because they are anticipating

If scientists are right, we're moving into a desperate situation on climate. I go to bed at night thinking, I hope these guys are badly wrong because if they're not we're in real trouble.

that they are going to be regulated one day. They can achieve a lot of corporate and social learning by getting there now, and they can achieve some competitive advantages by doing it now. If they're multinationals they're regulated in Europe anyhow under the European plans. I think they see this coming, and they're moving ahead of the curve, but it's good to see and it's good to know that Alcoa and Dupont and others can dramatically reduce their emissions. That's encouraging. A lot of these companies are networked together on the Chicago Climate Exchange.

Much of the insurance industry, including the big reinsurance giants in Europe — Swiss Re and Munich Re — are pushing hard to get responsible action on climate, recognizing that

extreme weather events are a tremendous risk for them.

You've got banks, different companies, and different sectors looking at the question of exposure to, climate risk, and taking these issues more seriously than our federal government. That is being driven by some big money such as CalPERS in California, demanding more responsibility in climate issues. *[The California Public Employee Retirement System is the largest in the U.S. Its investment portfolio exceeds \$113 billion. Ed.]*

There's an investors summit meeting coming up at the U.N. on climate risk. *[The U.N. Foundation organized a meeting held on May 10, 2005 where over 300 institutional investors met to assess the risk posed to their portfolios by climate change. Ed.]* There are many environmentally-screened mutual funds now and other screened investment programs, and this is helping to drive the process.

Another thing that's helping to drive this process is the figurative shot across the bow by a handful of state attorneys general who are suing utilities and others and letting them know that they are going to be held liable for climate damages one day just as the asbestos and tobacco industries have been held responsible for the damage they have done.

As all this is happening, the business community is responding and the financial and insurance industries are responding. It's not nearly enough, it's too slow, it's late and it's not the sea change that we need, but it does show that there are many people who have common sense and are responding to climate change.

ER: India and China are becoming big contributors to greenhouse gas emissions and we have no credibility or leverage to get them to slow it down.

GS: They have to be part of the Kyoto Protocol in the future, or whatever protocol it winds up being. The Chinese greenhouse gas emissions rival ours already. There's much that we will need to do through international agencies to provide incentives to turn the tide in these developing countries. Until the climate-friendly technologies become the cheaper ones, I think the industrial world of rich countries are going to have to provide powerful incentives for the developing world. China is contemplating building hundreds of coal plants. Getting emissions under control can't happen that way.

What should be the goal for the developing world? I don't think you can tell them that they have to start reducing emissions right away, but you can say, Your goal ought to be to dramatically and sharply increase your energy efficiency and reduction in your greenhouse gas emissions per unit of output. Output growth for them should overwhelm the decrease in carbon intensity, but eventually they will have to start reducing emissions also.

ER: We could help by monetizing carbon emissions. When alternative energy is cheaper, people will use it.

GS: I don't know if this is the best way to do it but we need some type of climate bank that would provide sufficiently below-market investment resources for climate-friendly technologies and related initiatives.

It's no mystery how to successfully engage the developing countries: it

requires determination and significant resources. It's a total cop out to sit on our hands and say, Well, until India and China start behaving on this issue we're not going to do anything either, which is the position that the Senate took in the Byrd-Hagel resolution. *[The Byrd-Hagel resolution passed the U.S. Senate 95-0 in 1997 saying the U.S. would not ratify the Kyoto treaty if it harmed the U.S. economy. No consideration was given to the cost to the U.S. economy of climate change. Ed.]*

Meanwhile, I think both Mr. Byrd and Mr. Hagel, as well as the two Alaskan senators, have gotten a little religion on the subject. Didn't I read somewhere that they both had voiced some alarm because the melting permafrost up there was so visible? *[Reuters reports in July 2004 that of 213 native Alaskan villages, 184 are experiencing serious flooding and*

Much of the insurance industry are pushing hard to get responsible action on climate, recognizing that extreme weather events are a tremendous risk for them.

erosion. Senator Stevens (R-Alaska) has expressed concern and will likely be looking for federal money for seawalls, dikes and relocation. Ed.]

ER: What can individuals do, either by themselves or collectively?

GS: The other dimension where we're beginning to see some response that could be helpful is in individual actions. It's not the dominant consumer pattern, but there is a demand for hybrid vehicles, and there are a number of people who are beginning to think again about solarization and increased energy efficiency in their homes and offices and transportation systems. It's

beginning to catch on again.

Eventually we're going to have to get serious about capturing carbon; that is, taking carbon out of emission gases and out of the atmosphere. We shouldn't forget about the forest sector; we shouldn't forget about geologic storage of carbon; and even the possibility of scrubbing carbon directly out of the atmosphere. If we overshoot 450 or 550 parts per million of carbon dioxide in the atmosphere and we want to reduce it, the only way to do that is to grow a lot more trees and have some type of artificial atmospheric carbon removal. Engineers are looking at that now.

ER: The lower costs of prevention compared to cleanup should get the attention of fiscal conservatives.

GS: We looked recently at an economic model that examined a carbon tax that could stabilize U.S. emissions between now and 2030. Let's say we want to stabilize between now and 2030 — which isn't enough for the U.S. — the cost of that is less than one-half of one percent of GDP in 2030.

This is consistent with econometric modeling that's been done in the United Kingdom where they have made a commitment to reduce greenhouse gas emissions by 60 percent by 2050. They estimate that it will cost 1 percent or 2 percent at most of their GDP by 2050 to do that, so these are not big costs in terms of the risks involved.

ER: It would help morale if nothing else if people could tie in to meaningful community action.

GS: People have access to what's going on in their cities, to what they're doing in their states, to what they're

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doing in lodges and associations that they belong to, and in universities, in a way that they don't in Washington.

We could have a green university movement in this country. Yale's greenhouse gas emissions exceed those of thirty-two countries, and I bet Harvard's do too and lots of other places. The larger student bodies and larger operations are worse, I suspect, so you could get a real benefit out of a massive shift in the universities in this country. What if the universities started investing their endowments in a climate-friendly way? You can build from things that look like modest efforts or almost symbolic efforts and all of a sudden they're not symbolic at all.

If the churches across the country are doing things, the temples and synagogues, hospitals, and all kinds of people make commitments to move ahead, pretty soon it adds up. You can act as a consumer at different levels, household associations and other associations. Many people in this country are investors and you can be a climate-friendly, environmentally responsible investor.

We need to bring this issue into our politics at all levels. There are many

things that we can do as consumers, as investors, as voters and as employees. It's going to take all of that. If scientists are right, we're rapidly moving into a desperate situation on climate. I go to bed at night saying, Well, I hope these guys are badly wrong because if they're not, we're in real trouble.

ER: The science community has to do a better job of communicating what climate change means.

GS: I think the scientific community has to give much more leadership on this issue than it has. Even the few scientists who get involved in discussions, the ones who think they're speaking out a lot, are probably not speaking out enough, and they are in such a minority.

I joke sometimes and say that I think all the scientists the government is funding on climate should go on strike until the government starts using the research results they've already produced. But that is facetious because so many important things are coming out now from current research. We need to be monitoring the oceans and

watching the Arctic and the Antarctic like a hawk. The scientists do have to give more leadership on this.

I'm afraid it's too late already to head off some serious things, but if we want to head off the worst we have to get busy. Only the scientists can communicate these technical and difficult issues to the public, and only the scientists have the credibility to convince people.

You asked about other kinds of movement. We need the outpouring of public support that we had in the early seventies. Maybe we are seeing the beginnings of that. The other thing that could happen which would precipitate it would be some type of event that would dramatize this issue like the ozone hole did for ozone depletion. One would think that we have these events already in the Arctic. It may take some major event like that to galvanize all the forces of society for change.

Additional Reading

1) *Red Sky at Morning*. James Gustave Speth 2004, Yale University Press, New Haven, CT. ISBN 0-300-10232-1

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