FIRE AND RAIN: HOW THE DESTRUCTION OF TROPICAL FORESTS IS FUELING CLIMATE CHANGE

HEARING

BEFORE THE

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING HOUSE OF REPRESENTATIVES

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HEARING ON FIRE AND RAIN: HOW THE DESTRUCTION OF TROPICAL FORESTS IS FUELING CLIMATE CHANGE

THURSDAY, FEBRUARY 14, 2008

HOUSE OF REPRESENTATIVES
SELECT COMMITTEE ON ENERGY INDEPENDENCE
AND GLOBAL WARMING
Washington, DC.

The Committee met, pursuant to call, at 2 p.m., in 430 Dirksen Senate Office Building, Hon. Edward Markey (chairman of the Committee) presiding.

Present: Representatives Markey, Blumenauer, Cleaver, Inslee and McNerney.

Staff present: Ana Unruh-Cohen, Joel Beauvais, Morgan Gray.

The CHAIRMAN. This hearing of the Select Committee on Energy Independence and Global Warning is now in order.

Our intention here, because of the press of business on the House floor, is not to lose the opportunity to hear from such expert witnesses. So I am going to forego my opening statement, and I am going to just begin by asking our witnesses if they would begin their testimony.

And with a little bit of luck, the floor schedule will allow other members to come over here in order for them to benefit from hearing your wisdom. But because there are eight roll calls that could be called in the very near future, I want to ensure that your record is enshrined in perpetuity in the Congressional Record.

[The prepared statement of Mr. Markey follows:]

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Opening Statement for Chairman Edward J. Markey
Select Committee on Energy Independence and Global Warming
"Fire and Rain: How the Destruction of Tropical Forests is Fueling Climate Change"
February 14, 2008

When the Speaker created the Select Committee, she charged us to help educate the Congress and the public on the important issues of global warming and energy independence. I don't think she envisioned us literally bringing our work to the Senate, but we are glad to be here this afternoon.

Over the last year, the Select Committee has examined a variety of ways to reduce global warming pollution from the burning of fossil fuels. Whether it is capturing the carbon dioxide from coal, generating electricity from new wind turbines, increasing the efficiency of cars or filling fuel tanks with *grass*oline, Congress has engaged in robust policy discussions.

Today we will examine a source of global warming pollution that has been relatively neglected on Capitol Hill – the destruction of tropical forests. When forests are cut down or burned they release the carbon stored within them. Twenty percent of global emissions of heat-trapping gases comes from cutting down forests. For many countries in the developing world, their contributions to global warming are almost entirely due to the loss of their forests. To find a global solution to global warming – one that involves all major emitters and all major sources – the emissions from the destruction of forests cannot be ignored.

More than just a source of global warming pollution, forests are a critical component of a safe climate. Covering an area approximately the size of the continental United States, the Amazon is the world's largest remaining expanse of tropical forest and fittingly described as the "lungs of the planet." It contributes to rainfall well beyond it borders, and with 20 percent of the world's freshwater flowing through it to the sea, the Amazon influences ocean currents that are themselves crucial regulators of the climate. Because of this role, conserving the Amazon forest becomes necessary to prevent catastrophic climate change for more reasons than just the carbon locked away in it.

But global warming is already having an impact on the Amazon and other tropical forests. Scientists have recently exposed the fingerprints of global warming on the devastating drought the Amazon experienced in 2005. Climate models predict an increasing risk of drought and fire and even the transformation of the rainforest to savanna if global warming continues unchecked. So in order to protect the Amazon, we also need to adopt policies that protect our planet.

The agreement in Bali this past December was a step forward in this regard. For the first time, developing world countries agreed to negotiate actions they would take to control emissions as part of an international climate agreement and climate negotiators agreed to consider policies that conserve forests -- and thus avoid emissions from their destruction -- within future international climate agreements. These two developments open the door to achieving a truly comprehensive and effective agreement that will protect people and the planet.

It is time for the Congress to re-establish America's position in the fight against global warming as a leader, not a laggard. When the Brazilians and citizens of other tropical forest nations look up in the sky, they see red, white and blue CO2. The United States alone is responsible for over a quarter of the carbon dioxide increase in the atmosphere over the last 150 years. Now we must take actions to reduce our own global warming pollution and work with countries around the world to develop policies that provide a competitive value for intact forests against other uses of the land.

There are many questions for Congress to consider when incorporating forest conservation into climate legislation. Our panel today will help the Select Committee begin sorting through these crucial issues, and I look forward to their testimony.

So let me begin. I will go first to Stuart Eizenstat, who going all the way back to the Carter administration has been a wise and sage counsel, not only on issues related to the environment but on so many issues across the spectrum that it is impossible to list them all.

So it is our great honor to have you back before us, Mr. Eizenstat. And whenever you are ready, please begin.

STATEMENTS OF MR. STUART EIZENSTAT, PARTNER, COVINGTON AND BURLINGTON, SUSTAINABLE FORESTRY MANAGEMENT; DR. THOMAS LOVEJOY, PRESIDENT, THE HEINZ CENTER; AND MS. STEPHANIE MEEKS, ACTING PRESIDENT AND CEO, THE NATURE CONSERVANCY

STATEMENT OF STUART EIZENSTAT

Mr. EIZENSTAT. Thank you, Mr. Chairman, and thank you for holding this hearing. As you know, I led the U.S. delegation for the negotiation of the Kyoto protocol. And at that time, forests were a major source of contention in those negotiations, and emissions from deforestation were indeed ultimately excluded. But much has changed since then, and today we have an opportunity to fill a gap left open by Kyoto, and I think Bali indicated a universal desire, including by the United States, to have forestry and avoided deforestation, an important part of the post-Kyoto world.

I am on the Advisory Board, Mr. Chairman, of Sustainable Forestry Management. I have been working with a variety of environmental groups, Environmental Defense, The Nature Conservancy, Conservation International, Defenders of Wildlife, the Wildlife Conservation Society, and major companies like Shell, AIG, PG&E, AEP, and Duke Energy, to develop a forced carbon set of principles.

Two very quick observations. The first is that the forest sector is key to dealing with our climate change problem, because it—deforestation accounts for about 20 percent of global greenhouse gas emissions. That is as much as the entire transportation sector worldwide.

Second, we can't solve the climate problem if we don't include forests. Despite its massive contribution to the climate change problem, deforestation in developing countries is excluded currently from the international climate regime by the rules governing Kyoto, and that makes no sense scientifically, economically, or politically.

Finding a way to bring deforestation and forest restoration into the climate regime offers the only meaningful path for many developing countries to participate in international efforts to deal with climate change. And without that, there will be no effective post-2012 international climate regime.

Mr. Sensenbrenner will remember when we were in Kyoto together—and I think, Mr. Chairman, you were there as well—that one of the big problems we had was dealing with the strangehold that China had, and India, on developing countries, many of whom wanted to take commitments and were not permitted to.

This is a way in deforestation to break that logjam, because there are a whole group of nations, including the rainforest nations, that want to take these commitments. Plus, this offers an ap-

proach to get developing countries into a post-Kyoto regime through sectoral approaches.

If they won't take economy-wide commitments, they may take sectoral commitments, forestry being one, but also transportation, utilities, and others. This is also a low-cost mitigation option available for U.S. companies to reduce the cost of their compliance with any ultimate U.S. cap and trade system.

There are two main options for financing efforts to reduce emissions from deforestation. The first is an international fund channeling money to developing countries to finance forest protection efforts. This can be done by foreign assistance and a variety of other things, but the important thing is that it is a public sector effort, a government-to-government effort.

The second option is a market-based mechanism that channels private sector capital to developing countries to fund forest protection efforts. The idea is that in any cap and trade system you design it so it recognizes credits for efforts to reduce emissions from deforestation, and, therefore, you leverage potentially significant flows of private sector capital to reduce emissions from deforestation.

In looking at these two options, there are a couple of key points. First, to have a meaningful impact on deforestation, you have to assemble a substantial amount of capital, because the pressures on developing countries to cut their forests down, make room for soybean production and export, is tremendous.

The Stern Report, Nicholas Stern for the U.K., estimated that it would take somewhere between $5- and $10 billion per year to provide sufficient offsetting incentives to reduce the incentive to deforest. And I seriously question whether the world and the U.S. are willing to finance that level. I doubt that they are.

Although multilateral and bilateral funding are certainly good if we can do it, we should look for ways to harness the carbon market, which just last year was some $60 billion to deliver capital on a scale needed to impact on the problem.

But having said that, both have a role. You can do both. But market-based mechanisms to me are far more powerful and leveraging private sector investments. Second, we have to pay careful attention to monitoring and quantifying changes in forest cover and forest carbon, and to the development of appropriate accounting frameworks to ensure environmental integrity.

In contrast to what occurred at Kyoto, significant progress has been made in the development of remote sensing and satellite capabilities and accounting methodologies—Brazil now being a world-class leader—to quantify changes in land cover and forest carbon stocks with confidence.

Third, integrated approaches are going to be necessary, and so we have to look at not just avoid a deforestation but afforestation and reforestation projects as well, which are permitted.

A breakthrough in Bali, agreed to by this administration as well, was that the most significant recognition by all countries is that whatever climate change regime ultimately emerges after Kyoto, it should include provisions for what were called at Bali "reduced emissions from deforestation and forest degradation."

This represents, Mr. Chairman, Mr. Congressman, an important step in filling the gap left open by Kyoto and includes deforestation in an international climate policy. So I appreciate very much you focusing on this. There are a number of issues that we will undoubtedly discuss on issues of leakage and permanence.

But the fact is that we have come light years since Kyoto. And this was evidenced again at Bali, recognizing that we are not going to solve climate change when 20 percent of all the emissions for CO_2 come from this sector, when it provides U.S. companies with a flexible low-cost way of offsetting the burdens that they will be under for any U.S. program. And that it is a way of involving developing countries who refused to play at Kyoto but are now willing to do so.

Thank you.

[The prepared statement of Mr. Eizenstat follows:]

Testimony of Stuart E. Eizenstat
Covington & Burling LLP
Before the House Select Committee on Energy Independence and Global Warming
February 14, 2008, 2:00 PM

Good afternoon, Mr. Chairman and members of the Select Committee. I am Stuart Eizenstat, a partner at Covington & Burling LLP. Thank you very much for the opportunity to testify today on deforestation and climate policy. I believe that this is one of the most important aspects of the climate change problem and I commend you for your attention to it. During my tenure as Under Secretary of State in the Clinton Administration, I led the U.S. delegation in the negotiation of the Kyoto Protocol. Forests were a major source of contention in those negotiations, and emissions from deforestation were ultimately excluded from the Kyoto Regime. But much has changed since Kyoto was negotiated, and today we have an opportunity to fill the gap left open by Kyoto by bringing deforestation into the international climate regime. I believe that the United States has a significant opportunity to lead on this issue. I currently serve on the advisory board of Sustainable Forestry Management and we have been working with Environmental Defense, the Nature Conservancy, Conservation International, Defenders of Wildlife, and the Wildlife Conservation Society as well as a number of major companies, including Shell, AIG, PG&E, AEP, and Duke Energy, to develop a Forest Carbon Dialogue that seeks to include domestic and international forest carbon provisions in U.S. climate legislation.

I. Deforestation and Climate Policy

There are two important observations that must be kept in mind as we explore options for including deforestation in international and domestic climate policy.

1. The forest sector is a key part of the climate change problem. As some of you may know and as you will hear more about today, deforestation -- almost all of which occurs in the tropics -- accounts for about 20% of global greenhouse gas emissions. That is more than the entire global transportation sector. Deforestation is the largest source of emissions in many developing countries, and some of the world's top emitters, such as Indonesia and Brazil, have achieved their rank largely because of emissions associated with deforestation.

2. We cannot solve the climate problem if we do not include forests. Despite its massive contribution to global climate change, deforestation in developing countries is currently excluded from the international climate regime by the rules governing the first commitment period (2008-2012) under the Kyoto Protocol. This makes no sense scientifically, and it makes no sense politically or economically.

The recent reports by Sir Nicholas Stern of the U.K. Government and the Intergovernmental Panel on Climate Change, among others, have identified reduced emissions from deforestation as a key low-cost mitigation option that is available now. In addition to the obvious climate protection benefits that come from reducing emissions from deforestation, protection of tropical and sub-tropical forests also generates significant social and environmental co-benefits,

including the conservation of biodiversity (tropical forests are home to half of the world's terrestrial species), the maintenance of critical ecosystem services, and the protection of livelihoods for many of the world's rural poor.

Finding a way to bring deforestation and forest restoration into the climate regime offers the only meaningful path for many developing countries to participate in international efforts to deal with climate change. And without developing country participation, there will not be an effective post-2012 international climate regime.

Because this is a low-cost mitigation option that is available now, we should be developing mechanisms to take advantage of these reductions as we work toward the fundamental transformation of our energy system. Put another way, recognizing credits for reduced emissions from deforestation in a U.S. cap-and-trade system will provide significant cost-control benefits and much needed flexibility to regulated entities in the U.S.

Simply put, we believe that reduced emissions from deforestation, together with efforts to plant new trees and restore forests, must be part of the solution to global climate change. It is certainly not the solution by itself, but we cannot even hope to stabilize the composition of the atmosphere at a level that avoids dangerous climate change without including forests.

II. Policy Options at the International Level for Financing Efforts to Prevent Deforestation

The current international policy debate has identified two main options for financing efforts to reduce emissions from deforestation:

1. An international fund (or collection of funds) that channels money to developing countries in order to finance forest protection efforts. This money could come from a variety of sources, including Overseas Development Assistance (ODA), carbon taxes, emissions allowance auction revenues, or debt-for-nature transactions. The important point is that this would depend on public sector, government-to-government financing.

2. Market-based mechanisms that channel private sector capital to developing countries in order to fund forest protection efforts. The basic idea here is that existing and emerging cap-and-trade systems could be designed to recognize credits for efforts to reduce emissions from deforestation and thereby leverage potentially significant flows of private sector capital for efforts to reduce emissions from deforestation.

In evaluating these two options, several key points should be kept in mind:

First, in order to have a meaningful impact on the problem, significant and sustainable flows of capital must be mobilized. The Stern Review, for example, estimates that it would take between $5 and $10 billion per year to significantly reduce deforestation in developing countries. We need to seriously question whether ODA or some other type of public financing could realistically provide this level of investment on a consistent and sustainable basis over time. My

view is that it cannot. Although multilateral and bilateral funding sources have an important role to play in this effort, we should also be looking for ways to harness the carbon market -- which doubled in size in 2007 to $60 billion -- as a vehicle for delivering capital on the scale needed to have an impact on the problem. Having a fund should not be considered inconsistent with using market-based mechanisms. Both can play a role, but market-based mechanisms are far more powerful in leveraging private sector investment.

Second, regardless of which policy instrument (or combination of instruments) is put in place to deal with the problem, careful attention must be given to monitoring and quantifying changes in forest cover and forest carbon and to the development of appropriate accounting frameworks for measuring progress and ensuring that the whole effort has environmental integrity. Without environmental integrity, the whole effort will collapse. In contrast to the situation prevailing a decade ago, significant progress has been made, particularly in the development of remote sensing capabilities and accounting methodologies, in our ability to quantify changes in land cover and forest carbon stocks with confidence.

Third, deforestation cannot be considered in a vacuum and there is no one-size-fits-all recipe for solving the problem. Regardless of how the financing for reduced emissions from deforestation is ultimately designed, careful attention must be given to the promotion of policies and projects that will address the fundamental drivers of deforestation -- drivers that vary within and among countries. Integrated approaches will be necessary to provide meaningful and economically rational alternatives to deforestation, which means that we must look at afforestation and reforestation projects in addition to and as complements of avoided deforestation efforts.

III. The Current State of International Negotiations to Create Mechanisms to Prevent Deforestation

The 13th Conference of the Parties to the United Nations Framework Convention on Climate Change, held last December in Bali, Indonesia (COP-13), produced three major outcomes:

First, COP-13 defined a path forward for the negotiation of a comprehensive agreement to take effect when the Kyoto Protocol's first commitment period ends in 2012. This is the so-called "Bali Action Plan." Notably, the United States joined the global consensus to launch this negotiation process.

Second, the developing countries assumed at least some qualified responsibility for reducing their own greenhouse gas emissions, within the context of their own economic development and with the assistance of wealthier countries. This is a significant development. It opens the door to an eventual agreement that will in some manner address the critical role of China, India and certain other G-77 countries that will be major contributors to climate change in the decades to come.

Third, and most significant for our purposes here, was the recognition by all countries that whatever climate change regime emerges in the next round of negotiations, it should include provisions for Reduced Emissions from Deforestation and forest Degradation (known as "REDD"). To that effect, the Bali Action Plan specifically references the importance of

addressing, in the context of the post-2012 agreement, "policy approaches and positive incentives on . . . reducing emissions from deforestation and forest degradation in developing countries." This represents a very important step in the direction of filling the gap left open by Kyoto and including deforestation in international climate policy.

Concurrently with the Bali Action Plan, COP-13 adopted a decision specifically on REDD, focusing on "approaches to stimulate action." This additional decision, which I will refer to as the "REDD Decision," calls for countries to undertake immediate efforts, including demonstration activities, to begin to address the drivers of deforestation and to determine the efficacy of various different approaches. Those early efforts are meant to be taken into consideration - and, presumably, credited in a post-2012 regime - when the eventual framework on "policy approaches and positive incentives" is ultimately agreed.

Attached to the REDD decision is a set of principles meant to provide "indicative guidance" with respect to the nature and goal of these demonstration activities. Of particular interest is the question of precisely how these demonstration activities, if conducted at a subnational level, will contribute ultimately to the development of "national approaches, reference levels and estimates [of deforestation]." This, like many other methodological issues, will be addressed over the course of the next two years.

What is critical here is that the international community, as represented by the Parties to the Framework Convention, now clearly recognizes that efforts to conserve the world's tropical and subtropical forests must be part of any long-term global framework for climate change mitigation. This is due in no small part to the remarkable efforts of the Coalition for Rainforest Nations and their allies in putting this issue on the agenda. It is now clear that the developing countries that are the stewards of these tropical and subtropical forests are offering to take real and measurable action to reduce deforestation, provided that the international regime is designed to offer the right incentives for action.

With regard to specific policy instruments, the REDD Decision does not expressly endorse any particular approach and certain countries have thus far insisted that this decision be pushed to future meetings. It is also important to recognize that different countries and blocks of countries have endorsed different instruments for dealing with REDD. In our view, market-based approaches offer the most realistic opportunity for generating the scale of capital flows needed to make a significant dent in the rate of deforestation - let alone the amounts required to actually reverse the overall trends and eventually to halt deforestation altogether. And the Bali Action Plan expressly calls for considering "[v]arious approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions." Many participants in the negotiations have noted that the term "positive incentives" is generally viewed as encompassing market mechanisms. My view is that markets must play a fundamental role in developing an effective policy for reducing emissions from deforestation.

For the reasons that I have outlined, the Parties to the Framework Convention will almost certainly include efforts to reduce emissions from deforestation in the global climate change strategy that emerges over the next couple of years. I submit to you that this will be a very good thing, for at least the following reasons:

First, the enormous environmental significance of preserving the world's forests, from the standpoint of the avoided carbon emissions and the protection of the Earth's climate system as well as the conservation of irreplaceable biological diversity and protection of vital ecosystem services;

Second, the importance of having the active participation by developing countries, such as those of the Coalition for Rainforest Nations, in the global effort to mitigate climate change;

Third, the importance of an avoided deforestation regime as a model for other developing countries to take targets in other sectors, such as electric power or transportation, rather than Kyoto-like, economy-wide commitments, which are unrealistic in the near term;

Fourth, the contribution that this will make to the willingness of the United States and other developed countries to take on ambitious targets or goals - knowing that all cost-effective alternatives are being explored and will eventually be available so long as they have environmental integrity; and

Last, but decidedly not least, the opportunities created by such an effort, if properly designed and implemented, for developing countries to forge an economic development path that is sustainable and consistent with the preservation of these vital natural assets.

IV. Opportunities for U.S. Leadership

The US has a real opportunity -- in its domestic climate legislation -- to lead on the deforestation issue by including provisions that recognize credits for reduced emissions from deforestation in developing countries. Such forest carbon credits would provide much-needed flexibility and cost control for regulated entities under a U.S. cap and trade system, while incentivizing developing countries to take action to reduce emissions from the forest sector.

And this does not have to wait -- indeed it should not wait -- until a post-2012 agreement is negotiated and in place. My view is that Congress can design legislation that allows credits for reduced emissions from deforestation and other forest carbon activities into a U.S. cap-and-trade system in a manner that ensures environmental integrity without imposing massive transactions costs on the whole effort.

To that effect, we are encouraged by the provisions in the current version of the Lieberman-Warner bill which allocate 2.5% of total emissions allowances to international forest carbon activities. We would like to see that percentage increase, but we also believe that the current provision that allows regulated entities to satisfy 15% of their compliance obligations with credits from international trading systems should be opened up to include credits for international forest carbon activities. This would allow regulated entities to tap into the cost-control benefits of these activities, thereby reducing the overall costs of a cap-and-trade program to the U.S. economy. All of this, of course, would also give a huge boost to the whole effort to protect and restore tropical forests in developing countries and encourage those countries to participate in a global climate protection effort.

We hope, therefore, that the House will also recognize the importance of incorporating reduced emissions from deforestation in its own cap-and-trade legislation, and we would urge that any such provisions be built on a robust market-based approach.

The CHAIRMAN. Thank you, Mr. Eizenstat.

Our second witness, Dr. Thomas Lovejoy, is the President of The Heinz Center for Science, Economics, and the Environment. He is a world-renowned expert on climate change issues.

We welcome you, Dr. Lovejoy. Whenever you are ready, please begin.

STATEMENT OF THOMAS LOVEJOY

Mr. LOVEJOY. Mr. Chairman, Mr. Congressman, thank you for the opportunity to talk a bit about the relationship between forests and climate change. Tropical forests are a hugely important part of the picture, as we have heard. Like out of five additional molecules of CO_2 come from tropical deforestation.

And to underscore it, those kinds of emissions make Brazil the third largest emitter, and Indonesia the fourth. Or to put it another way, were the remaining Amazon forests to be deforested, that is equivalent to 15 years of the annual global increase of greenhouse gases.

The Amazon is also, in turn, vulnerable to climate change. And the IPCC synthesis report states very clearly that if global temperature rises to 4½ degrees Fahrenheit over pre-industrial that there will be massive Amazon dieback, creating a positive feedback and greater release of greenhouse gases to the atmosphere.

We are currently essentially stuck with additional climate change that will bring us to 2.7 degrees Fahrenheit. Most projections look to 2030 with 3.6, so we are not very far away from that kind of calamity. And in 2005, the Amazon was subject to the greatest drought in recorded history, and many of us consider that phenomenon a preview of what climate change could bring.

There is an additional aspect to the Amazon, which other tropical forests do not have, or at least not to the same degree, and that the Amazon literally makes half of its own rainfall. And we now know in the last two to three years that a significant portion of that rainfall ends up, once it is bounced off the Andes, going down to southern Brazil, where it is critical for a large part of their agro industry.

So there is a role here in climate continentally, as well as globally, and there is an additional incentive there for the Brazilian government to take the Amazon deforestation issue even more seriously.

So there is a mixed picture in the Amazon, which I know you are about to go to. A lot of positive things have happened in Brazil, so that today 40 percent of the Brazilian Amazon is under some form of protection. But at the same time, every year something like 8,000 square miles, roughly an area larger than the State of New Jersey, undergoes deforestation. Major economic forces driving that, particularly soybeans and a renewed vitality in the cattle industry. And so the big issue there is how you actually tilt that situation so they go towards one of the goals in Brazil of zero deforestation.

Public opinion is largely in favor of conserving the Amazon and managing it, as opposed to letting it be deforested. And I think the kinds of things we have been talking about here which would provide funding for positive incentives for those living in the Amazon

to basically use the forest while maintaining it, is in the end the key. There has got to be feed from that into political will.

And there are wonderful bright spots, like the state of Amazonas, 2.3 times the size of Texas, where you will be on Saturday, where the governor has a really great vision of how his state will have a future with the forest and without major deforestation.

So there is an opportunity here I think with one of the more sophisticated nations of the world, namely Brazil, to work out a partnership that might go beyond what it could mean for the future of the Amazon in that forest and climate change to actually taking it to something at the global level for all the tropical forest nations.

Thank you very much.

[The prepared statement of Mr. Lovejoy follows:]

Testimony
Thomas E. Lovejoy
President
The Heinz Center for Science, Economics and the Environment

Hearing on Deforestation
The House Select Committee on Energy Independence and Global Warming
February 14, 2008

Thank you for the opportunity to testify about the relationship between tropical forests, and the Amazon in particular, to climate change. I am President of the Heinz Center for Science, Economics and the Environment -- a non-partisan and non-advocacy environmental policy center focused on global change. We specialize in bringing the perspectives of business, government, academia and environmental groups to our policy discussions. I personally have worked in the Amazon since 1965 on science and environmental policy.

No comprehensive approach to climate change can ignore the approximately 20% of annual greenhouse gas increase in the atmosphere that comes from tropical deforestation, and it, of course, has its own intrinsic importance from a biodiversity perspective. After China and the United States, the two biggest emitters (i.e, third and fourth) of greenhouse gases

are Brazil and Indonesia. So the Amazon and its deforestation loom large in these considerations: were the Amazon to be completely deforested it would produce greenhouse gas emissions equivalent to 15 years of annual global increases in green house gas concentrations.

In addition climate change can have a major impact on the Amazon. Current estimates from the Inter-Governmental Panel on Climate Change (IPCC) are that at 4.5 degrees Fahrenheit increase in global average temperature, Amazon dieback will occur -- not the entire Amazon but large parts of it. Indeed, the most severe drought in recorded Amazon history occurred in 2005, and was associated with changes in the circulation of the Atlantic that could, in a sense, have been a preview of what climate change could bring. This of course would be a positive feedback releasing yet more greenhouse gases to the atmosphere.

Amazon dieback is not that far a distant possibility: at current concentrations, we are currently automatically slated for 2.7 degrees Fahrenheit of increase in average global temperature because of the lag time between increase in greenhouse gas concentrations and radiant energy being

trapped by them, and most projections bring us close to 3.6 degrees Fahrenheit by 2030.

An important additional factor is that the Amazon has been known for more than 25 years (based on work originally done by Brazilian scientist Eneas Salati), to create something on the order of half its own rainfall. This is because the rain dropped by the westward moving air masses evaporates off the complex surfaces of the forest as well as being transpired by the trees, producing rain farther to the west. It has been obvious for some time that continuing deforestation will at some point undercut the hydrological cycle.

We now know the Amazon can be affected by El Niño events on the Pacific side of South America. This can create Amazon drought separate from the cause of that in 2005. It is also possible for deforestation, El Niño and the 2005 type of drought to occur simultaneously. This would essentially lead to super sensitivity to early climate changes effects.

The question, of course, is what can be done to stem the ongoing high rates of deforestation which often range as high as 20,000 sq. kilometers a

year – somewhat larger than the state of New Jersey. These are driven by economic forces including the expansion of soybeans and a major resurgence of cattle production.

Brazil produces respected and reliable annual estimates of deforestation. The other Amazon nations do not. But one of the things that is needed is real time remote sensing data that can be married with effective rapid response enforcement of government policies. At one point the state of Mato Grosso had such a system. That would suggest it is within the realm of the possible to establish this for the entire Brazilian Amazon.

Yet another part of the solution is suggested by the programs of the progressive government of Eduardo Braga, governor of the Brazilian state of Amazonas (2.3 times the size of Texas). His government in recent years has increased protected areas and areas set aside for sustainable development reserves (generally natural resource based). There also are important experiments in payments to communities that use but maintain the forest. This could be a useful foreshadowing of what might be possible once carbon payments are available through the mechanism related to the Kyoto Protocol.

What is clear is that Brazil should be a major partner in advancing rational management of the Amazon. Brazil has major scientific and technical capacity, and there is general public interest in Brazil in protecting the Amazon, although clearly there are some economic interests that work to the contrary. It has also now become very much in Brazil's immediate economic interest to control deforestation, because we now know that a significant portion of the rain that falls south of the Amazon in Mato Grosso and São Paulo states -- the center of their major agro-industry and some important hydroelectric power facilities -- comes from the Amazon. Brazil needs the Amazon rain machine.

The key will be to jointly design a true partnership that is respectful of Brazil's capacities and sovereignty so as to achieve real progress in this key element in the climate change and sustainable development agenda.

The CHAIRMAN. Thank you so much, Dr. Lovejoy.

And our final witness is Ms. Stephanie Meeks, who is the Acting President and CEO of The Nature Conservancy. And that program oversees forest conservation programs around the world.

We welcome you for all of the wonderful work that you do, and your organization does. And whenever you are ready, please begin.

STATEMENT OF STEPHANIE MEEKS

Ms. MEEKS. Thank you, Mr. Chairman. Through on-the-ground conservation work in all 50 states, and in more than 30 countries, The Nature Conservancy has protected more than 117 million acres of land, 5,000 miles of river, and has more than 100 marine projects around the world in places that are already feeling the effects of climate change. We are proud to be supported in this work by more than a million members in the United States and partners.

Climate change is the most urgent environmental challenge that our world faces today. Every acre of land and mile of coast protected by The Nature Conservancy will be affected by climate change, and The Conservancy urges Congress to act quickly to cap and reduce emissions to levels that are sustainable for people and nature.

I am grateful for the opportunity to testify today on reducing emissions from deforestation and degradation. The Conservancy considers this strategy to be one of the most promising ways to combat climate change in the near term. Emissions from deforestation and land use change exceed those of the entire transportation sector, as we have already heard. And reducing these emissions can and must play a significant role in a comprehensive solution on climate change that involves all major sources of emissions and all major emitters.

Through our work on the ground, The Nature Conservancy has demonstrated that activities to reduce deforestation can provide real and verifiable emissions reductions. As a leader on forest carbon, our conservation work includes five large-scale projects in Belize, Bolivia, and Brazil. These projects have reduced, and continue to reduce, emissions from deforestation while also protecting more than one and a half million acres of forest that harbors unique plants, animals, and natural communities, while bringing benefits such as jobs, infrastructure, and training to local communities.

Through these projects and with our partners, we have advanced rigorous standards to ensure that emissions reductions achieved are real and verifiable. We are currently working in Indonesia and in the Brazilian state of Mato Grosso to help those governments develop pilot programs to reduce deforestation emissions.

In addition to our project work, The Nature Conservancy has joined The World Bank's Forest Carbon Partnership Facility in order to pilot effective approaches and a successful funding mechanism. To date, 10 donor governments have also contributed. The partnership would be further advanced by a decision by the U.S. Government to join.

These experiences have provided valuable lessons for the development of policies to help reduce emissions from deforestation. I

would like to share with you some of these recommendations. First, policies to combat deforestation and forest degradation should aim for emissions reductions on a scale sufficiently significant to mitigate climate change.

U.S. legislation should encourage tropical forest nations to develop national scale accounting programs to reduce deforestation by accepting credits from these countries. Second, policies must mobilize sufficient and stable levels of funding through market mechanisms as well as through non-market mechanisms such as development assistance.

Third, policies and programs should respect, protect, and build upon the rights and needs in indigenous peoples in local communities, and should support activities that contribute additional environmental benefits. Fourth, policies should encourage early action to reduce deforestation while these forests are intact, and this potential solution to mitigating climate change is still at our disposal.

In summary, it is critical for U.S. climate legislation to address the challenge of tropical deforestation by opening access to the U.S. carbon market. This approach will offer many benefits. It will directly address the 20 percent of global emissions that result from deforestation and land use. It can unleash billions of dollars in private sector carbon finance to save the world's forests and other irreplaceable biodiversity from destruction.

It can help reduce the costs of domestic climate policy for U.S. companies and the economy. It will be an essential part of winning a global deal on climate change that ensures action by all major emitting countries. And, finally, it will improve the quality of life for local people by reducing the negative impacts of deforestation on communities.

Mechanisms to reduce emissions from deforestation and forest degradation are among the most promising ways to reduce greenhouse gas emissions in the near term. They can and must play a significant role in a comprehensive solution to climate change.

Thank you for the opportunity to testify here today, and my written testimony provides more detail on The Conservancy's views on these and related issues.

[The prepared statement of Ms. Meeks follows:]

Testimony of Stephanie Meeks, Acting President and CEO
The Nature Conservancy
Before the House Select Committee on Energy Independence and Global Warming
February 14, 2008, 2:00 PM

Summary

Crediting activities to reduce emissions from deforestation and degradation ("REDD") in tropical forests within U.S. cap-and-trade legislation offers Congress **the opportunity to ensure U.S. leadership in advancing a comprehensive, effective, and truly global solution to climate change**. Including incentives in U.S. legislation to sustain and increase carbon storage in tropical forests is **critical to reducing the approximately 20% of total global greenhouse gas emissions** that come from deforestation and forest degradation and thus to combating climate change effectively. Doing so would also offer four additional benefits:

- Efforts to reduce emissions from deforestation and forest degradation can **provide moderate cost emission reduction opportunities** that can be used by U.S. companies to comply with a U.S. carbon cap. This provides **a "green" way to contain the costs** of U.S. climate policy while supporting conservation activities
- Further, U.S. policy that credits activities to reduce emissions from deforestation will be **an essential part of forging a global agreement on climate change** that assures action from all major sources and emitting countries.
- U.S. policy to include emissions reductions from deforestation can **unleash the power of the market and provide tens of billions of dollars in carbon finance to save the world's forests and all their biodiversity** from destruction. .
- Finally, it can **improve the quality of life for local people by** reducing the negative impacts of deforestation on communities while providing direct benefits in the form of new economic options.

Among climate change solutions, REDD stands out as a mitigation tool that offers win-win-win solutions for economies, the environment, and poverty reduction.

Through its work on the ground, **The Nature Conservancy has demonstrated that activities to reduce deforestation can provide real and verifiable emissions reductions.** The Conservancy's on-the-ground conservation work includes five large-scale REDD projects in Belize, Bolivia and Brazil that have reduced and continue to reduce emissions from deforestation while also protecting almost 1.8 million acres of high biodiversity forest land. In addition to our project work, The Nature Conservancy has joined the World Bank's Forest Carbon Partnership Facility in order to pilot a successful funding mechanism for REDD.

Lessons learned from these efforts help inform the development of **effective policies on REDD that can drive national scale programs, stimulate adequate levels of funding, respect the rights of local people, create added biodiversity benefits on the ground, and encourage early action.**

Body of Testimony

Good afternoon, Mr. Chairman and members of the Committee, I am Stephanie Meeks, the acting President and CEO of The Nature Conservancy. Thank you for the opportunity to testify today on climate change and reducing emissions from deforestation and forest degradation (REDD). REDD is one of the most promising ways to reduce greenhouse gas emissions in the near-term, and it can and must play a significant role in an effective and comprehensive solution to climate change that involves all major sources of emissions and all major emitters. Strong U.S. leadership is needed on this issue to catalyze greater global efforts that involve all countries in solutions to climate change. I thank you for calling attention to this critical issue through today's hearing.

My comments today will begin with background on The Nature Conservancy's interest and involvement in climate change mitigation and will then focus on four main themes:

1. The critical role that reducing emissions from deforestation and degradation can play in comprehensive, cost-effective solutions to climate change;
2. How U.S. climate legislation can be used to foster policies to combat climate change and avoid deforestation internationally;
3. The Nature Conservancy's experience with forest carbon activities and financial mechanisms, and lessons learned from that experience that inform what a REDD mechanism might look like on the ground;
4. Policy options for REDD in an international climate policy framework;

In addition, as requested by the committee, I will provide information and views on the The World Bank's Forest Carbon Partnership Facility; and U.S. legislation to address illegal logging.

The Nature Conservancy and Climate Change

The Nature Conservancy is an international, nonprofit organization dedicated to the conservation of biological diversity. Our mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Our on-the-ground conservation work is carried out in all 50 states and in more than 30 countries and is supported by approximately one million individual members. The Nature Conservancy has protected more than 117 million acres of land and 5,000 miles of river and more than 100 marine areas around the world.

Climate change is the greatest environmental challenge that our society faces today. Every acre of land and mile of coast protected by The Nature Conservancy will be affected by climate change. **Climate change is already stressing human and natural systems** in a way that menaces natural economies, human economies, people and biodiversity. **Prompt action to address this threat is essential to minimize future harm to nature and to the social and economic fabric of our communities**. Aware of this urgency, The Nature Conservancy has undertaken projects around the world to demonstrate effective solutions to climate change. Our on-the-ground conservation work

includes five large-scale REDD projects in Belize, Bolivia and Brazil that have reduced and continue to reduce emissions from deforestation while protecting almost 1.8 million acres of species-rich forest land while bringing benefits to local communities.

A Comprehensive U.S. Climate Policy

While the testimony provided today focuses on reducing emissions from deforestation and forest degradation, strong action to address all major causes of climate change across sectors is essential. The Nature Conservancy urges Congress to act quickly to address this mounting challenge. We advocate multi-sector climate change policies that include three paramount concepts:

1. *A strong cost-effective cap on emissions and a market-based program designed to stabilize atmospheric greenhouse gas concentrations at a level that ensures the well-being of human communities and ecosystems worldwide.* The core function of a climate change policy should be to set in motion and sustain a course of long-term reductions in greenhouse gas emissions that will be sufficient to stabilize the climate at a level that will protect human society and the natural world. A program should be designed to be cost-effective and to send appropriate long-term price signals to stimulate needed investment in emissions-reducing technologies. A mandatory cap on greenhouse gas emissions with opportunities for trading should be at the core of any policy approach to address this issue. The Conservancy is a member of the U.S. Climate Action Partnership and has endorsed USCAP's call for U.S. emissions reductions aimed at limiting global atmospheric greenhouse gas concentrations to a level that minimizes large-scale adverse climate change impacts to people and nature.[1]

2. *Incorporation of verified credits from reduction of emissions from forest and land-use practices.* A U.S. policy that includes forest carbon should:

   - ✓ Create strong incentives for national-scale efforts in developing countries;
   - ✓ Permit forest carbon credits to be fully fungible with credits from emission reductions activities in other sectors;
   - ✓ Allow trading of domestic and international forest carbon credits that represent real emissions reductions;
   - ✓ Assure early action credits for qualifying activities taken prior to the start date for any U.S. cap-and-trade program;

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[1] The US CAP's Call to Action states

"We recommend Congress establish a mandatory emission reduction pathway with specific targets that are: between 100–105% of today's levels within five years of rapid enactment; between 90–100% of today's levels within ten years of rapid enactment; between 70–90% of today's levels within fifteen years of rapid enactment. The short- and mid-term targets selected by Congress should be aimed at making it clear to the millions of actors in our economy and to other nations that we are committed to a pathway that will slow, stop and reverse the growth of U.S. emissions. Furthermore, Congress should specify an emission target zone aimed at reducing emissions by 60% to 80% from current levels by 2050."

The Call to Action and more information on US CAP is available at www.us-cap.org.

- ✓ Encourage forest carbon activities to produce broad benefits for local communities and the environment, and promote sustainable development objectives; and
- ✓ Assure that forest carbon credits are of high quality by requiring that such credits represent real, permanent, and verifiable emissions reductions, with reliable measuring and monitoring and appropriate accounting for *leakage*, or emissions that result from the shifting of deforestation activities outside the project area.

3. *Support for programs and activities designed to help ecosystems and people that rely on them to cope with the impacts of climate change.* U.S. policy should dedicate a share of allowance auction proceeds to supporting such adaptation programs both in the U.S. and abroad. The Lieberman-Warner Climate Security Act (S. 2191) provides a strong example of how the adaptation needs of natural systems, particularly those in the U.S., can be addressed in climate legislation. Enacting legislation that supports international adaptation efforts as well will help to assure a global deal on climate change, and if structured properly, can also advance international conservation objectives.

U.S. leadership is essential to catalyze successful global efforts to adopt comprehensive climate policy that includes the above concepts. A strong U.S. climate policy would open significant channels for international cooperation that can:

- Provide incentives and pathways for developing countries to participate in reducing greenhouse gas emissions;
- Create important opportunities for U.S. companies to engage in international carbon markets and to export U.S. clean technologies; and
- Help maximize efficiencies and thus control the costs.of climate mitigation.

Among climate change solutions, REDD stands out as a mitigation tool that bridges country divides and offers win-win-win solutions for economies, the environment, and poverty reduction.

The Importance of REDD in Preventing Dangerous Levels of Climate Change

To slow, stop, and reverse the growth in greenhouse gas emissions and safely stabilize the earth's climate, the world must reduce deforestation. While emissions from energy and industry capture significant attention, deforestation accounts for about 20 percent of global greenhouse gas emissions – *more than the entire global transportation sector* – as carbon dioxide is released into the atmosphere when forests are cut and burned or left to decay. More than 37 million acres of tropical forest – an area larger than New York State - are lost each year. For many developing countries, deforestation is the largest source of emissions. This is why Indonesia and Brazil are among the largest greenhouse gas emitters, just behind the U.S. and China, and ahead of other industrialized economies, and land use change accounts for 70-90 percent of their total emissions.

The value of tropical forests to plants, animals and people is well understood and often not properly valued. Beyond their species richness, forests provide life-sustaining services such as food, fuel, shelter, water regulation and climate stabilization. Several studies, including the Stern Review on the economics of climate change, affirm that *slowing deforestation can be one of the most cost-effective options for combating climate change quickly* and that it can contribute significantly both to biodiversity protection and, with appropriate institutional arrangements, to improving livelihoods.

However, in the global efforts to tackle climate change, the role of conserving forests has not been sufficiently addressed to date. Existing climate policies, including the Kyoto Protocol, do not recognize the protection of standing forests as a source for carbon emissions reductions. As a result, the protection of tropical forests is not valued in today's carbon marketplace. Through domestic climate legislation, the U.S. can lead the way toward a comprehensive international solution to climate change that addresses the significant emissions from deforestation and forest degradation.

Including REDD in U.S. Climate Legislation

The inclusion of REDD in the Bali Action Plan is a welcome sign that the substantial role that forests can play as a cost-effective mitigation tool has been recognized and that all governments are committed to a more prominent role for forest conservation through the sustainable use of forests in a post-2012 climate change agreement. The U.S. has an opportunity to take the lead on informing on-going international negotiations through our domestic climate policies. **Reducing deforestation outside the U.S. must be part of U.S. legislation as well as any future international agreement to address climate change.** This opportunity has not been fully realized in most climate legislation submitted to date. **Crediting efforts to reduce deforestation and forest degradation within U.S. climate legislation will offer an array of benefits**:

- It is **critical to reducing the roughly 20% of emissions** that come from deforestation and degradation and thus to **effectively combating climate change**;
- Efforts to reduce emissions from deforestation and forest degradation can **provide moderate cost emission reduction opportunities that can be used by U.S. companies to comply with a U.S. carbon cap.** This provides a "green" way to contain the costs of U.S. climate policy while supporting forest conservation.
- Establishing a U.S. policy that credits activities to reduce emissions from deforestation will be **an essential step in forging a global agreement on climate change** that assures comparable action from all major emitting countries; and
- It will unleash tens of billions of dollars in carbon finance to **save the world's forests and all their biodiversity from destruction**;
- It will **improve the quality of life for local people** by reducing the negative impacts of deforestation and providing direct economic benefits in the form of new livelihood options and financial compensation;

To achieve these benefits, U.S. legislation should:

1) Authorize U.S. emitters to tender for compliance forest carbon tons from nations that have adopted a national forestry sector program meeting certain criteria. Participating national forestry sector programs would be expected to:

- Establish a national baseline based on historical data on land cover change and associated carbon emissions, taking into account national circumstances;
- Obtain reliable measurement of reductions through a combined nation-wide program of remote sensing and rigorous field measurement and verification;
- Put infrastructure and institutions in place to measure, monitor, and track emissions from deforestation and forest degradation, and to implement and enforce forest conservation measures; and
- Assure permanence by, for example, holding a portion of their carbon credits in reserve.

2) **Encourage countries that have not developed the capacity** for a national program to reduce their deforestation emissions **by authorizing U.S. emitters to tender for compliance offset credits from forest carbon projects in these countries.** In order to encourage countries to establish national forestry sector programs, this program could be phased out after a number of years.

Including such provisions in federal legislation would establish the U.S. as a leader on this emerging issue, and set the stage for an agreement at Copenhagen in 2009 that includes developing countries. At the same time, it would help to address cost containment issues that are a dominant feature of the current domestic policy discussion.

The Conservancy's On-the-Ground Forest Carbon Project Experience

On-the-ground experience with implementing REDD projects is crucial to informing effective policies that maximize the benefits that crediting such forest carbon activities in a U.S. market can bring. The Nature Conservancy has considerable experience with avoided deforestation, forest management, and reforestation projects on the ground in developing countries and the U.S. Since 1996, The Nature Conservancy and our partner organizations have developed forest carbon projects in Belize, Bolivia, and Brazil, and within the U.S.

Five large-scale REDD projects in Belize, Bolivia and Brazil have reduced and continue to reduce emissions from deforestation while also protecting almost 1.8 million acres of forest land. The on-the-ground experience gained through these projects is directly relevant to the policy options under discussion in international negotiations. The largest of these projects, **the Noël Kempff Mercado Climate Action Project, demonstrates that activities to reduce deforestation can provide real, verifiable emissions reductions.**

The Noël Kempff project in Bolivia included the formal expansion of the Noël Kempff Mercado National Park, ending logging in concessions within the park expansion area, and stopping conversion of forest to marginal ranchland and row crops through assistance in land titling for indigenous communities located adjacent to the project area, a sustainable development program for local communities, and strengthened park protection. The local communities benefitted significantly from these activities. The project included a community component designed to support the sustainable development goals of local communities while avoiding or minimizing forest conversion outside the project area. Legal assistance for gaining land tenure for indigenous communities, revolving funds for micro-enterprises such as agroforestry and sustainable heart-of-palm operations, improved health care and education facilities, infrastructure for ecotourism, and jobs as park guards and carbon monitoring technicians are among the benefits the project has offered the local communities.

The Noël Kempff project provides lessons on some of the key challenges in developing a REDD mechanism. The project pioneered methods needed to reduce deforestation and to measure the associated emissions reductions. The approaches used included use of long-standing scientific and forest-inventory principles, as well as new remote-sensing technology and other innovations. Some of this innovation was supported by the U.S. Agency for International Development and the Department of Energy through grants to The Nature Conservancy and our partners.

As part of the project, the emission reductions, baseline, and leakage assessment were measured, validated and verified by a third party Designated Operational Entity accredited by the Clean Development Mechanism Executive Board for projects under the Kyoto Protocol. The investments in methodologies and technologies, and their validation in this project, provide a foundation for increasing the scale of the work beyond projects to entire countries.

The project revealed that, while leakage from reduced deforestation projects can be significant, it can be accounted for and addressed. In the project, leakage was significantly reduced by providing local communities with economic opportunities that avoided forest removal or degradation. The leakage that The Nature Conservancy was unable to reduce was quantified and deducted from the project's total emissions reduction benefits. This deduction for leakage reduced the total emissions reduction benefits from the project by about 15%

Scaling up to the National Level – A REDD Mechanism On-the-Ground

Experience with Noël Kempff and The Nature Conservancy's forest carbon projects in Belize and Brazil's Atlantic Forest has revealed relatively high transaction costs related to credibly measuring emissions reductions and leakage at the project scale. One lesson that can be drawn from this experience, therefore, is the importance of **national-scale approaches** to REDD. National or sub-national REDD activities offer significant advantages in establishing common and comparable techniques across large areas, reducing detection and monitoring costs related to leakage, and creating further

economies of scale. Statistical sampling for forest carbon measurement and monitoring, for example, becomes more cost-effective at progressively larger scales like countries and regions.

Perhaps more importantly, national-scale REDD approaches would serve to engage governments that have the power to affect program and policy changes aimed at addressing the root causes of deforestation. For example, activities like improving tenure security, strengthening protected area management, controlling fires, incentivizing intensification of agriculture, strategic planning of road improvements, and reducing illegal logging are all strategies for reducing deforestation that require government involvement to solve. Expanding REDD activities to the national or sub-national scale would facilitate the use of national-level polices to address these wide-ranging drivers of deforestation while not precluding complementary project approaches such as creating protected areas.

REDD projects can be a useful stepping-stone toward a national program. While Noël Kempff was created as a REDD project, many of the techniques and approaches used are applicable to national approaches. For example, the monitoring methods used could also be applied to measure emissions reductions from sector-wide approaches to reduce national deforestation rates, and the leakage assessment was performed at a national-scale. **The Government of Bolivia is in the process of developing a national-scale REDD program built upon foundations developed for the Noël Kempff project.**

Though developing national REDD programs in developing countries will be challenging, it is important to point out that base of experience for REDD program implementation is not limited to the few projects implemented explicitly as emissions reductions projects. While these projects provide some of the best examples of the procedures for measuring changes in forest carbon and developing the payment distribution mechanisms required for sharing benefits of carbon finance, **institutions like the Nature Conservancy have spent decades refining strategies for reducing forest loss and degradation that protect biodiversity and create benefits for local communities. These efforts have yielded many successes and many useful lessons, yet they have failed to create incentives that address the forces of deforestation and forest degradation at the required scale**. Without an economic rationale for sustainability, neither the private sector nor governments have had the will to act. REDD is a potential financing mechanism that can channel unprecedented incentives and fundamentally change the approach to land management within developing countries.

Many developing countries have indicated that they are ready to make that change, if the appropriate financing mechanisms are put in place. REDD was introduced to the UN climate negotiations by the Coalition of Rainforest Nations, led by Costa Rica and Papua New Guinea, as a promising mechanism to mobilize the financing needed to really change land-use practices. In 2007, Indonesia took a leadership role in the global dialogue on REDD when it convened leaders of other forest-rich countries for a joint statement on the topic, and also launched a national REDD strategy development process. Following a clear endorsement of demonstration activities in the Bali REDD decision

document, the Government of Indonesia is anticipating a demonstration phase including a range of initiatives throughout the country. Likewise, Brazil has indicated the intent to develop an Amazon-wide REDD program, and has reached out to others for partnership.

Brazil and Indonesia have led the world in deforestation and forest degradation because there has been an overwhelming economic rationale for clearing forest. Soybeans and cattle in Brazil and timber and oil palm in Indonesia have been big businesses, while sustainable forest management, and protection of global environmental services has not.

The Nature Conservancy believes that making the protection of global environmental services an appealing financial proposition for developing countries is one of the most important near-term opportunities for mitigating climate change. We are currently engaged in directly supporting a range of countries where we work, including Brazil and Indonesia. In each country, we are supporting REDD program development at the national, state (province), and local levels, working with public sector, private sector, and communities. To be successful, REDD programs must align incentives across the full range of stakeholders.

Options for an International Policy Framework to Reduce Emissions from Deforestation and Forest Degradation

While a concrete policy framework has not yet been developed for how a REDD mechanism would operate, the current state of international and U.S. policy discussions on REDD issues have highlighted a number of options for the structure of a REDD mechanism. It will be important for the United States to have a clear understanding of these choices to ensure that an international REDD mechanism results in effective forest protection on the ground that makes a measurable difference for the climate, for local communities, and for biodiversity. The principal policy options are laid out below.

Scale

To effectively combat deforestation and degradation at a scale sufficient to meaningfully impact climate change, it will be essential to scale up from existing, project-level forest carbon activities. Policies on REDD should therefore encourage national-scale efforts to reduce deforestation. Such a national-level mechanism would achieve emissions reductions at significant scale, with lower transaction costs and reduced concerns about leakage. Accounting of emissions reductions would be measured and reported at a national scale, while implementation could proceed both through national programs and policies, and through project-level activities.

While the primary emphasis of a REDD mechanism should be on national-level activities, some developing countries may not be prepared to begin national-level activities in the short-term. Policies on REDD could thus create transitional pathways to assist those countries that currently do not have the capacity for national-level accounting; these would allow credits from project-level activities from such countries to be eligible for crediting.

In both national-level and project-level programs, governments will need to find ways to encourage private investment in REDD. Under a national-level program, one approach would allow either government entities or private investors to undertake projects that would also account for reductions at the project level. A linking mechanism between the projects and the overall emissions of the country could be designed to eliminate risks of double-counting. This type of hybrid mechanism may better account for leakage while still fostering private investment in projects.

Financing
Two main avenues have been proposed for financing REDD: a market-based approach and a non-market based approach.

Proponents of a market-based REDD mechanism emphasize the huge potential revenue generation of the carbon markets. A market-based mechanism is considered by many to be the only means of raising sufficient and sustainable funding to achieve large-scale reductions in deforestation in developing countries.

A non-market-based approach to REDD could include a number of funding sources, such as increased official development assistance (ODA), debt-for-nature swaps, taxes on carbon intensive commodities or services, taxes on revenues from the other Kyoto mechanisms, and/or multilateral donor funds. Proponents of non-market financing are concerned that including REDD credits in a market system may cause significant disruptions due to unpredictable volumes of credits or substantially lower prices, or may reduce the incentives for Annex-I countries to meet their commitments domestically.

The two approaches are not mutually exclusive. A mixture of market and non-market funding could be feasible, such as donor funds for readiness activities and up-front implementation financing, combined with a market for verified reductions.

Social and Environmental Benefits
REDD activities have the potential to create a number of benefits beyond reducing emissions, including environmental benefits such as biodiversity conservation, water regulation, and reduced erosion, and social benefits such as increased employment and formal recognition of indigenous lands. A REDD mechanism should seek to complement and promote these environmental and social objectives, while "doing no harm" as well. **The Nature Conservancy and others have developed the Climate, Community and Biodiversity Standards to guide the design of forest carbon activities** to ensure multiple concurrent benefits. These standards were recently applied to assist in the design of REDD activities in Aceh, Indonesia. Furthermore, a REDD mechanism should strive to maintain consistency with other international agreements such as the Convention on Biological Diversity, in order to ensure efficiency, coordination, and synergies in seeking comprehensive approaches to global problems.

Early Action
In light of the urgency of climate change and the rapid loss of tropical forests, **establishing a strong signal that emissions reductions from REDD activities**

undertaken now will be credited in the post-2012 commitment periods has become an important issue. Doing so would encourage countries to undertake readiness activities and begin to make real reductions between now and 2012. Readiness activities and pilot projects are, however, learning processes and some early activities may not meet necessary standards for environmental integrity due to inexperience. Therefore, some advocate that early activities should be encouraged through other funding, and not through creditable emissions reductions destined for the carbon market. **One way to encourage early activities, while still maintaining environmental integrity, would be to credit only those activities whose reductions can be verified by an accredited third party.**

Essential Elements of a REDD Mechanism

In summary, the specific criteria for a future REDD mechanism are still being worked out in international and U.S. policy discussions and will need to be guided by lessons learned on the ground during the incipient demonstration phase. Policy flexibility is therefore important at this stage, but a few key conditions should be included. The Nature Conservancy believes that a REDD mechanism:

- Should encourage development of national-scale accounting programs to reduce deforestation as quickly as possible, and create transitional pathways to assist those countries that currently do not have the capacity for national-level accounting;
- Should allow countries flexibility in determining the desired scale of action, whether project, sub-national, national, or a combination, and implementing the institutional arrangements necessary;
- Needs to mobilize sufficient and stable levels of funding through appropriate combinations of market and non-market approaches;
- Must respect, protect, and build upon the rights and needs of indigenous peoples and local communities and should support activities that contribute additional environmental benefits; and
- Should encourage pre-2012 action.

The World Bank's Forest Carbon Partnership Facility

The Conservancy has joined the Forest Carbon Partnership Facility (FCPF) to develop a model for assisting developing countries in their efforts to reduce emissions from deforestation and forest degradation. The Facility's objectives are to: (1) build developing country capacity for activities that reduce emissions from deforestation; and (2) test - on a modest scale - a program of performance-based incentive payments in pilot countries.

The strategic goal of the Facility is to set the stage for a much larger system of positive incentives and financing flows in the future. Such financing needs to counter the intense and growing pressures on global forests. The Stern Review estimated that halting deforestation would require more than $5 billion a year to compensate activities currently driving this trend. Clearly new funding sources are needed, and the private sector finance will be fundamental.

The FCPF consists of two mechanisms, for which the World Bank will act as Trustee:

- **The Readiness Mechanism** (target size: US$100 million) will assist approximately 20 countries in preparing themselves to participate in a future, large-scale, system of positive incentives for REDD. This will include some basic "infrastructure capacity building" for these countries such as preparing a national REDD strategy, establishing a baseline (i.e., reference scenario) and putting in place a monitoring system. Indigenous groups and other forest dwellers will participate in the process so they can benefit from future carbon finance flows.

- **The Carbon Finance Mechanism** (target size: US$200 million) will enable an initial group of these countries that will have successfully participated in the Readiness Mechanism to pilot incentive payments for REDD. The Carbon Fund will remunerate the selected countries or actors within the selected countries, in accordance with negotiated contracts, for verified emissions reductions.

The FCPF was launched at the 13th session of the Conference of the Parties to the UNFCCC in Bali. The FCPF will become operational once the minimum contributions have been received, which is expected to be in the first half of 2008. During this time, FCPF planning is continuing, in consultation with key international stakeholders. The Facility is currently supported by 10 country governments (Germany, Denmark, France, Norway, Switzerland, Japan, the Netherlands, Australia, the United Kingdom and Finland) and The Nature Conservancy. The total amount pledged is $165 million[2] thus far, with additional contributions under consideration from other countries, the private sector, foundations and NGOs.

Illegal Logging and Deforestation

Illegal logging contributes substantially to deforestation worldwide. Approximately 30-32% of wood export products from China, 15-30% of exports from Russia, 100% of log exports and 55% of plywood exports from Indonesia, and 15% of export products from Brazil are from suspicious sources or are illegal. Approximately 10% of the forest products import stream into the U.S is estimated to be illegal.

Illegal logging encompasses a wide range of practices associated with the harvest, processing, transport and export of timber and timber products in violation of established laws and operational policies. Timber operators deviate from approved management plans for a number of reasons and then tree species valued in the international market are extracted beyond permitted levels, areas designated for harvest in subsequent years are exploited prematurely, and/or operations move outside of permitted areas into

[2] This consists of pledges from Germany (US$59 million), the United Kingdom (US$30 million), the Netherlands (US$22 million), Australia and Japan (US$10 million each), France and Switzerland (US$7 million each), Denmark, Norway and Finland (US$5 million each). The Nature Conservancy has committed US$5 million.

neighboring concessions and/or protected areas. Once this happens, the concessions rapidly lose their viability, and timber operators move on, often turning land over to settlers who convert it to subsistence and light commercial agriculture, and eventually industrial-scale agriculture. In other instances, the timber operations are merely a pretense to prepare the land for industrial-scale agriculture to meet the growing global demand for crops such as soy, sugar, and palm oil. Unintentionally or by design, virgin forest is eventually transformed to agricultural lands or lands sought out for other economic purposes. This scenario plays out on a daily basis throughout the tropics, in Russia, and in other important forested nations.

Illegal logging persists because of the ability to sell these products into a global marketplace that does not discriminate between legal and illegal timber. While millions of dollars have been invested over the years in "supply-side" efforts to improve forest sector governance in producing countries and to build institutional and technical capacity to manage forests and enforce the rule of law, little has been done to address the demand side of the equation. **The single most important element in reducing the demand for products derived from illegally harvested timber is to make it illegal to knowingly import, market, distribute and/or sell such products in the U.S. market.** This is the basis of the efforts underway in both the Senate and the House to amend the Lacey Act to include the provisions for the import of illegal timber and timber products.

Amending the Lacey Act would send a very strong signal to U.S. importers, often responsible enterprises, that they must do the fundamental due diligence to fully understand their supply chains and track imports back to the source. This, in turn, would build U.S. market demand for legal wood and create an incentive for timber operators to comply with national laws and operational policies. Legislation prohibiting the importation of illegally logged timber and timber products into the United States would create the enabling policy framework required to transform the operations of the forest products industry. Such legislation would further support and be supported by an effective REDD mechanism.

Conclusion

Emissions from deforestation are a major source of global greenhouse gases and any solution to address climate change must reduce these emissions. The U.S. is a global leader, and our leadership is essential to achieving a solution to climate change that includes all major economies around the world that contribute to the problem. Congress needs to ensure that U.S. legislation includes mechanisms that will engage the power of carbon markets to address this problem. REDD should be a critical component of such legislation because it can reduce emissions quickly, it is cost-competitive with other mitigation options, and it brings developing countries into mitigation efforts. Through our on-the-ground work in developing countries, The Nature Conservancy has demonstrated that credits generated from reducing deforestation can represent real, permanent, and verifiable emissions reductions with reliable measuring and monitoring and appropriate accounting for leakage. The major obstacles to a successful REDD mechanism that harnesses the power of carbon markets to conserve vast repositories of biodiversity,

improve local livelihoods in developing countries, and help mitigate climate change are no longer technical, but rather political and financial. The U.S. can lead the way in overcoming those obstacles and bridging international divides in the path toward a comprehensive and effective global solution to climate change.

The CHAIRMAN. Thank you, Ms. Meeks, very much.

There are now eight roll calls that are about to be conducted on the House floor. And I am afraid—I know that Mr. Eizenstat has to leave in 55 minutes, and that will actually most likely consume the entire time that it takes for those roll calls to be conducted. So I would just like to ask you, Mr. Eizenstat, what do you see as the future trajectory for international negotiations to create policies that prevent deforestation?

Mr. EIZENSTAT. Well, first of all, I think it will be critically important for the U.S. to show leadership by passing its own cap and trade program. If we don't do that, then it is very difficult to make the rest of the world, Mr. Chairman, serious about their responsibilities.

Second, what I would like to see—and it is embedded in the Warner-Lieberman legislation—is that there is a two and a half percent provision for international forest credits, and then there is a 15 percent provision, which allows international trading, but it is silent as to whether forestry credits could be included.

As you, Mr. Chairman, help shape the House legislation, it will be absolutely critical for you to assure that the House legislation includes an even more robust allowance for international trading in forestry credits. The reason being that that will help provide U.S. companies who will be bound by our own cap and trade program to have the flexibility to trade, if they wish, internationally with rainforest countries and others, and provide the kind of incentive that all three of us are suggesting is necessary to prevent these countries from cutting their own forests down.

It has a dual advantage. The advantage is that it helps lower the cost of compliance for U.S. companies, and it provides incentives and financial incentives for the tropical forest countries, the Brazils, the Indonesias, the Papua New Guineas, and others, not to cut down their forests. That has to be embedded into our own legislation.

As we then evolve on the——

The CHAIRMAN. I hate to do this, Stuart, but if I don't leave right now I will miss the roll call.

Mr. EIZENSTAT. I would not want you to be absent.

The CHAIRMAN. And I do apologize to you. The——

Mr. EIZENSTAT. I am more than happy to stay until 3:30 or so, but——

The CHAIRMAN. Okay. Well, we will be coming back just around that time. And I did want to have an opportunity to have your entire opening statement and whatever questions we could ask of you.

But at this point, we are going to take a recess for about 45 minutes or so.

Mr. EIZENSTAT. Yes.

The CHAIRMAN. And then, we will reconvene.

Mr. EIZENSTAT. Again, I think the key thing is your leadership on the House bill and getting forestry credits included in the House bill. That is absolutely critical to getting the international buy-in.

The CHAIRMAN. Got it. Thank you.

[Recess.]

The CHAIRMAN. This hearing in the Select Committee on Energy Independence and Global Warming is once again reconvened to talk about how the destruction of tropical forests is fueling climate change.

The chair will recognize himself for a round of questions.

Dr. Lovejoy, it is clear that an effective economic signal for preserving forests is necessary. From your experience, what policies would be the most effective?

Mr. LOVEJOY. Well, in terms of the economic signal, I think it is very important that the money get channeled to the people and the region you are trying to protect, that it doesn't get sort of set up in some distant capital. It has just got to connect pretty directly to the people who are living there.

And I think an additional way to think about it is it probably should be set up as something which is an annual payment rather than a one-time payment, so that sort of a payment for a service or rent or something like that.

And, you know, we, the larger conservation community, The Natural Conservancy, etcetera, have certainly, you know, long experience in doing individual projects around the world. And I would say that the vast majority of those have succeeded in the end. They may have encountered problems that they didn't anticipate in advance, but as long as they sort of didn't turn their back on their project, and just pay no more attention, they were able to address whatever new factor was involved.

So I think the other question that needs some real thought is to—is how to avoid the so-called leakage problem, where you protect the forests in one place, and so the force of destruction is moved somewhere else. So I think the whole notion of working things out at the national level, where it all can be monitored, and most of the leakage will be contained within the country, is probably the way to go.

The CHAIRMAN. You mentioned earlier the Amazonia and the high esteem for which you hold the governor.

Mr. LOVEJOY. Yes. The state of Amazonas, yes.

The CHAIRMAN. The state of Amazonas. That is not the national level, and so how—in that context, just in the Brazilian context, how would you recommend that a program be established that ensures that there is no leakage, as you are looking at that central question?

Mr. LOVEJOY. I mean, the interesting thing about what they are doing in Amazonas is they are doing a combination of things, which include setting up protected areas, areas which are particularly set aside for sustainable use but not forest destruction. And they also are making payments to communities that are maintaining and using their forests. So you sort of have a prototype there.

And I think it could be scaled up to the national level, if the Brazilian government is willing to do that. And the art of the game here is to really turn it into a partnership with Brazil, which could then go on I think and provide leadership to the rainforest nations generally.

The CHAIRMAN. So what—if you could tell me, what is the relationship, from your perspective, between the national government and Brazil and this regional government that is demonstrating con-

cern about the deforestation in the Amazon? What would you recommend that the United States do to help to encourage, create a national participation in planning strategies to deal with these regional issues?

Mr. LOVEJOY. Well, I think basically what you want to do is find ways to encourage the national government to buy into the kinds of initiatives that are happening in that and in a couple other of the Amazon states. I mean, in a sense, it is analogous to the leadership of California and the New England states on climate change in this country, which I think we are going to see within a year or two transformed into a national policy.

So I think those things are best determined in conversations rather than in sort of public statements. I mean, the Brazilian government has opened the door to this idea of avoid a deforestation payment, and so I think, you know, some kind of a discussion where it is all put in a very positive way could lead them to take some major steps.

And, particularly, I would encourage your CODEL to put a little spotlight on the Amazon as a rain machine for the agro industry and hydropower in central and southern Brazil. And I have provided a video for you to take on the CODEL, which actually shows this happening and makes it real to anybody. It is not a whole bunch of numbers or graphs. It is an actual model of how water moves around the planet.

The CHAIRMAN. Beautiful. Now, did you agree with Mr. Eizenstat's recommendations as to how these issues should be handled? Anything you would add to or modify that he said in terms of how we should be handling these issues, and how we need an international component to any legislation which we pass?

Mr. LOVEJOY. Well, I do completely agree with him. One, that it will be much easier to achieve meaningful programs internationally with forests once the U.S. is seen to be taking leadership with its own cap and trade bill. And, second, that it is important to have some provision for inclusion of forests in these bills, but there has got to be a balance between that and actually tackling the energy base in this country. Otherwise, we could easily get backwash from countries saying, "Well, you are not really addressing the problem."

The CHAIRMAN. You are saying we have to act in a responsible fashion?

Mr. LOVEJOY. Yes, indeed.

The CHAIRMAN. Yes. So, you can't preach temperance from a barstool.

Mr. LOVEJOY. That is right.

The CHAIRMAN. You can't have a beer in your hand while you are telling people it is bad for you to drink. So I agree with that 100 percent, and that was his—I think that was what Mr. Eizenstat said. That is his first recommendation, that we pass a mandatory——

Mr. LOVEJOY. Yes, absolutely.

The CHAIRMAN [continuing]. Auction and trade bill.

Ms. Meeks, a critical issue that Congress will face when including forest conservation in climate legislation is making sure the protections for forests are permanent. So from your experience with

projects around the world, how should Congress deal with this issue for permanent protection?

Dr. Lovejoy was just saying that the payments should perhaps be on a yearly basis, so the incentive is there for the next year as well, and that it was performance-based. Do you have any recommendations as to how a formula could be constructed?

Ms. MEEKS. well, we would agree with that, with what Dr. Lovejoy said. And in addition—and we have had experience with this issue in a couple of different places that I would point your attention to—in carbon projects that we have done in the United States, as an example, where permanent conservation easements allow for that permanence and that guarantee that you are alluding to.

And internationally it is a little bit different. I can point to one example that I referenced in my opening testimony. In Bolivia, the Noel Kempff Mercado Climate Action Project, where we actually worked with the government to buy additional acres surrounding a national park, and they became part of the national park system. And so that contributes to the permanence there, and that project is actually endowed and is monitored over time.

So at a project level, there are a number of different ways to get at the permanence question. Scaling up, though, it is also a question that can be addressed at the national level. And we strongly advocate that forest carbon—the markets be set up in a way that take advantage of national government's ability to put policies in place to deal with forestry and agricultural issues on a national scale. And in that context, it is easier to deal with the permanence issue, because what might happen in one project can be amended or adjusted for in another place.

The CHAIRMAN. Okay. Dr. Lovejoy, or Ms. Meeks, has there ever been a calculation made as to the totality of the role which illegal logging plays in deforestation?

Mr. LOVEJOY. I certainly think there are estimates of it. And, you know, in the Brazilian Amazon, I would guess that at least half of the annual deforestation is due to illegal logging.

The CHAIRMAN. Ms. Meeks.

Ms. MEEKS. I was—we do have some numbers on that, and I can send them to you. They are significant globally, in the Amazon of course, and in Indonesia that is also a very critical issue.

The CHAIRMAN. And when international negotiations are being conducted, what focus is placed upon illegal logging in terms of trying to reach agreements that, you know, go across nations?

Ms. MEEKS. Well, it is quite substantial. In Indonesia, where The Nature Conservancy has done some work, we are working at the state level, just as Dr. Lovejoy was talking about in Amazonas, with the government there to put into place forest policies that would address such issues as illegal logging. And so that is a central part of coming up with a forest management regime that would be part of a comprehensive plan that deals for—that sets up the enabling conditions for a forest carbon program.

The CHAIRMAN. And earlier this year there were reports that in Brazil, which had been making progress in controlling deforestation, but they received satellite images, that showed that the rates of clear cutting had increased dramatically in recent months.

So what sort of technologies would you recommend, or mechanisms be put in place, that make it possible for us to ensure that deforestation can be noticed in a very time-sensitive fashion as it is happening, so that it can be stopped rather than reporting it after the fact? Do you have any recommendations as to what would be the best technologies or mechanisms to accomplish that goal?

Mr. LOVEJOY. Well, if I might start this discussion—Stephanie I am sure will have things to add—what you need is real-time remote sensing data. Brazil is noted for the excellence and reliability of its annual estimates of deforestation rates, but it is always after the fact, too late to do anything with it to enforce the beginning of some illegal deforestation.

One of the Brazilian states 10 or 15 years ago actually had a real-time operation in place with daily monitoring. It was the state of Mato Grosso. And as soon as clearing would begin to appear, they would send the helicopters out. And they actually had gotten to a point where the GPS data that they could take when they were—the helicopter arrived would stand up in the Brazilian courts. And it worked very well, and then it was just allowed to fall apart.

But it basically shows that if you really want to do it, you can.

Ms. MEEKS. Well, I think that is right, and I would only add that technology is really on our side in this regard. It has become a lot easier to monitor what is happening in forests globally, and at any point in time we can see what is happening.

And so to this issue of permanence and what is happening on the ground, technology has come a long way. And it is not terribly expensive. The government of Australia has initiated a surveillance of their entire nation and their forests and land use changes, and it only costs a couple million dollars a year. So it is both effective and cost effective.

The CHAIRMAN. So do you believe that the technology to have real-time monitoring exists today, but the money hasn't been invested in it in a sufficient way to deploy it, or that we need to actually develop better technologies in order to monitor? Do you think the—in other words, do you think the technologies already exist? Or do we need to improve on those technologies in order to develop this real-time capacity?

Ms. MEEKS. I think the technologies exist today, and the piece that is missing is that a lot of countries have not developed their internal capacity to implement and use these technologies.

The CHAIRMAN. I see.

Mr. LOVEJOY. So, actually, one thing that relates to all of this is NASA's programs that used to be called Mission to Planet Earth. And those have been allowed to be neglected in favor of other activities. And, you know, there are other aspects of monitoring this planet that need attention at the same time.

The CHAIRMAN. When you say that NASA has allowed these programs to deteriorate, what do you mean by that?

Mr. LOVEJOY. Well, I mean, take Landsat, for example. I mean, basically we have one Landsat up there in space going around, is way overdue for its allotted life-span. And the next one is not slated for any near time, so it could wink out tomorrow. I mean, that is not a good way to——

The CHAIRMAN. Could capacity on already-deployed satellites be reprogrammed in order to provide the same information?

Mr. LOVEJOY. I am certain that is possible, and some of the sort of classified satellites could certainly provide information, too.

The CHAIRMAN. Okay. I think that is a good project for the Select Committee to work on to determine how we can get inside of the total satellite deployment of the United States and find a way to give you that up-to-date information.

The chair's time has expired. The chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you. I want to ask about carbon sequestration forests, and we have been trying to get a handle on how we really assure additionality if we are going to have programs that give credits for maintenance of forests. So I guess just if I can ask your advice on how we—is additionality something we should in fact insist on if we are going to give credits for maintenance of forests? Should we ensure that we have some program to assure that it is an additional asset that would not otherwise be maintained? And, if so, how do we do that?

Mr. LOVEJOY. If I understand your question correctly, I mean, there is sort of actually two parts to it. One is in a sense the reforestation part, which is, all things being equal, is real additionality. And then, the other part of it is what we were touching on before. You know, if you really increase the protected area forest in a region, is that merely going to be offset by some deforestation as the logging companies or whatever go elsewhere?

Mr. INSLEE. You just go next door.

Mr. LOVEJOY. Yes. And that I think is best dealt with at the national level, and——

Mr. INSLEE. In other words, you said a national acres——

Mr. LOVEJOY. National forest carbon accounting. It is not hard to do.

Mr. INSLEE. So you would say, "We will give you credit if your entire nation state will increase its forest land by X acres."

Mr. LOVEJOY. That would be one way to do it. And the other way would be to give some credit if they sharply and markedly decrease their rate of deforestation.

Mr. INSLEE. But in the real world, how do you do that? I mean, right now there are these exchanges going on today. So let us say I am a landowner, and I want to sell my development rights and get a credit, and some utility wants to buy that credit, if you will.

I can't sell a national asset. I can sell you my property development rights, if you will, but I can't guarantee my neighbors aren't going to do it. Do you have to have a national repository, then, of that asset somehow?

Mr. LOVEJOY. Well, I think you need the national accounting.

Mr. INSLEE. But how do you—in real life, let us say I am a land—I have got a forest lot, and I want to sell to you, XYZ Utility, my development rights, so you can claim a credit if you will. I can't—when I sell you that, I can't guarantee that my next-door neighbor isn't—once I sell my development rights, I can't guarantee he'll just go clear-cut his land. So how do we really—what are we really buying then?

Mr. LOVEJOY. Well, I mean, that is why you actually need to take it to the level of national responsibility, which sets up immediate internal political pressures to do it right.

Mr. INSLEE. So what we are really going to have to do to make this work, it seems to me, is a national scheme where if I am a utility I might go to Bolivia and buy a certain number of acres from Bolivia, and they have got to administer it somehow. Is that what it boils down to?

Mr. LOVEJOY. Yes. And within the context of Bolivia actually having its own national accounting and not having some kind of offset going on there.

Mr. INSLEE. Right. But in the European system right now, I suspect they are not really doing that. They are cutting deals right now to buy certain acres from the landowner, and not protecting against the guy next door just doing a clear cut.

Mr. LOVEJOY. My understanding is that is a fundamental weakness.

Mr. INSLEE. Right.

Mr. LOVEJOY. Stephanie.

Ms. MEEKS. Well, I might just add—I mean, you can deal for—with the additionality question and the leakage question at the project scale, and it gets back to doing this baseline monitoring at the beginning. What is currently happening in this forest plot or in this county or in this state or in this nation? And then, monitoring the changes against that over time.

The challenge at the project level, of course, is that it doesn't get to any meaningful scale of actually taking advantage of the carbon mitigation that could happen through avoided deforestation. But I think that one of the things that we have to make sure that we do is create the financial mechanisms for countries to care about this, and then they will institute the policies that will drive behavior that will lead to this good result.

Mr. INSLEE. Second question: when you do this, is it good enough to put land to say, "I will maintain this as a wood lot, but I will be taking successive harvest off of it and then replanting?" Should that qualify for a carbon sequestration credit?

Ms. MEEKS. It can in determining the way the—either at the project scale or the national scale as part of a forest management plan. Forestry doesn't have to cease to exist, but it has to be done in a way that accounts for the growth of new trees, as trees are being harvested.

Mr. INSLEE. Thank you.

The CHAIRMAN. The gentleman's time has expired. The chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman.

Mr. Inslee actually delved into the area of my interest and concern. Is there, in your opinion, a political mechanism by which the United States can move these primarily Third World countries, which creates a whole new economic issue, separate and distinct from the other problems of global warming? But is there a way that we can negotiate with these countries concerning deforestation, considering the fact that we don't have one of the sterling reputations around the world for moving progressively on this issue?

Ms. MEEKS. Well, I—to your point, I think the most important thing that the Congress can do is to help enact legislation that will put the United States back on very firm footing in international negotiations and give us the right to talk about this issue with developing countries.

At the very beginning, Chairman Markey asked, "What is the most important market signal that Congress could send through legislation?" And I think that is recognizing the value of forest carbon, and that it is every bit as valuable as carbon emitted from other sectors, and in so doing creating this market that will enable Third World and developing countries to participate in the solution to climate change.

Mr. LOVEJOY. So I would merely add to that that, you know, once we have sort of achieved a certain amount of credibility on the climate change issue, that then it will become possible to do a lot of additional activity which could include, you know, technological help, remote sensing, data help, and even sort of working things out on a one-to-one basis with particular nations. We can get ahead of a more patient and slow international negotiation process, and actually get some things done.

Mr. CLEAVER. So before we can—before we would have any impact anywhere, you are saying we need to have the moral high ground to discuss this with countries? I mean——

Mr. LOVEJOY. I mean, I think that is fundamentally true, but I—you know, it is not too soon to start talking about it in parallel as we work up to what I think is clearly going to be national legislation within a year or two.

Mr. CLEAVER. After November. Is there something that the United States can give to those—to the countries that are just systematically wiping out the rainforest that would enable them to feel economically secure enough to discontinue it? Is there foreign aid that we can provide that would discourage—let us do it on the positive side—that would encourage the governments and its people to not only back away from destroying the rainforest, but trying to rebuild it or allow God to rebuild it?

Mr. LOVEJOY. Sir, my answer to that is an emphatic yes. There are a whole array of things one can do, and one of the really interesting things that is often overlooked is that part of the key here is improving the economic opportunity and quality of life of cities in these rainforest regions, because if there is reasonable economic activity and quality of life in cities, a lot of that population will be attracted to that and not be out in the countryside engaging in deforestation.

Ms. MEEKS. And I would only add, I think you have hit on a very important point. Part of the solution can be foreign aid and overseas development assistance. But it strikes us that the scale of the problem or the opportunity, depending on how you look at it here, is so vast that involving private markets will be a much more efficient and ultimately a more effective way of getting enough financial incentives into the system to really change this at a fundamental level, which is what we are talking about.

Mr. CLEAVER. Thank you, Mr. Chairman.

The CHAIRMAN. Okay. The gentleman's time has expired.

Does the gentleman from Washington State have additional questions he would like to pose to the witnesses?

Mr. INSLEE. I do thank you, Mr. Chair. I appreciate it.

I saw somewhere, and it may be in your testimony or in a committee report, about the cost of carbon—CO_2 reduction was $3 a ton by—when you engage in a project maintaining forest land, it is $3 a ton, which is like a low price relative to other, you know, sources of energy and the like.

And it looked to me like it is probably lower than, you know, 60 percent of the other costs of other alternatives. Am I reading that right? And, if so, should it be the first thing that we look at after efficiency and conservation and the real, real cheap stuff to do that actually has a negative cost?

You know, according to this McKenzie report, 40 percent of what we have to do actually has a negative cost. So that $3 is still competing with a lot of things that actually make us money over the long run. But that appeared to be the cheapest—about the cheapest that had some cost. Could you guys respond to that?

Ms. MEEKS. Well, I think that is a really important point, and that is why avoided deforestation is a win-win-win strategy, because it keeps carbon from being released into the atmosphere. It is one of the cheapest opportunities that we have in front of us for dealing with greenhouse gas emissions.

And in terms of forest carbon, you have the added benefit of biodiversity conservation and the community improvement values that we were talking about a few minutes ago. So I think that is very key, and it is why we wanted to be here and are grateful to have the opportunity to talk with you about this today, because it just really seems like a no-brainer to us that we would want to include forest carbon as one of the options for the United States and moving forward.

Mr. LOVEJOY. So if I may add to that, you know, there are people who worry that the inclusion of forests will just knock the bottom out of the carbon market and make it—just flood it, take it down to a price where nothing will happen. I think in fact, as the real urgency of climate change hits home, that we won't be able to find enough carbon to sequester, and that we won't have to worry about that price.

Mr. INSLEE. Thank you.

Mr. CLEAVER. While the Chairman is away——

The CHAIRMAN. The chair recognizes the gentleman from Missouri, Mr. Cleaver——

Mr. CLEAVER. Thank you.

The CHAIRMAN [continuing]. For a round of questions.

Mr. CLEAVER. Thank you.

What do you think would be the biggest, the greatest surprise in the Amazon Basin to members of Congress? What would we be awestruck by?

Mr. LOVEJOY. I think it is the relationship of the Amazon to the continental climate as well as the global climate. And it turns out that the Amazon actually makes half of its own rainfall. It is quite extraordinary, and it is well nailed down scientifically by good Brazilian science, in fact.

So there does come a point where if there is too much deforestation all of that begins to unravel, and it is not enough rainfall to maintain a rainforest, and you have some terrible feedback loops going. If you can avoid getting to that point, you will also be securing a significant portion of the rainfall south of the Amazon in Brazil and in northern Argentina, which is really important for their agro industry, and it is really important for their hydropower.

And their only—this particular message is a surprise to most people at this point, but it gives the Brazilians an additional incentive to collaborate in these larger exercises we have been talking about.

Mr. CLEAVER. I have family members in Tanzania that live around in the city of Arusha and around Kilamanjaro, which is not a rainforest, but there is some deforestation going on. And the people go in and they kill—the people who live in the area they go in and they kill animals that are on the endangered list, endangered species list.

And I will never forget saying to a cousin of mine, "You know, the leopard is really endangered. And, you know, you guys, you know, need to be careful. I mean, you are killing too many." And he said to me, "The appreciation for the leopard increases with your distance from the bush."

And I think that is the kind of thing we run into when people around in the rainforest are, you know, starving, logging is the only way they can, you know, get a meal, and even then it is—they are going to be ripped off. But we have a conundrum. How do we, you know, convince people that it is in the best interest not only of their community, their nation, but it is also in the best interest of the world that this stop when they—when they are saying, "You know, it is easy for you to say, you know, you are living in Missouri."

Mr. LOVEJOY. My answer to that is simply, you know, those words will not solve that problem. You have to create economic opportunities for those people that do not involve destroying the forest, and that is one of the real attractions of the kinds of carbon money we are talking about here where somebody can have a piece of forest, they can use it for forestry, they can use it for ecotourism, they can use it for non-timber forest products, and still get an income for maintaining it in forest. And you add all of that up and it begins to be pretty reasonable.

Mr. CLEAVER. Well, that is—actually, you went in the exact direction that I was hoping, because ecotourism is something that I would suggest to my own family. You know, not safaris, but ecotourism, where you go out and actually live in and with the world as it was originally designed. And so it is a very painful reality that people will destroy that which they need to survive in order to survive temporarily.

The CHAIRMAN. Great. Let me just ask this—the Select Committee is going to Brazil for five days beginning tomorrow. Tell us from your perspective, what should we be looking for? What recommendations should we be making? What would you give us as your words of counsel, as we land in Brazil tomorrow evening?

Mr. LOVEJOY. Well, I guess I get to answer that first, having been doing that for about 43 years. Just have real conversations

with the people there. I mean, you would do that anyway, but there are some pretty sophisticated people, and you will find them, you know, starting with the Amazonas state government officials that you will meet with, and some of the scientists you are going to see at the National Institute for their Amazon Research. And these are world-class scientists who have been working on these issues for years.

And the kind of interest that you displayed in this hearing I think will win them over in no time, and you will be having some very fruitful discussions.

The CHAIRMAN. Ms. Meeks.

Ms. MEEKS. I would be interested in having you ask them the question that you asked us at the beginning of this hearing, which is: what does the United States need to do in order to get a country like Brazil to take their deforestation seriously? And what kind of market mechanisms would they be looking to for their level of interest? Answering some of these questions about leakage and additionality and permanence that you have asked us today.

I agree with Dr. Lovejoy. I think there is a number of sophisticated people in countries around the world who are wrestling with these issues, and I think it would be very interesting for the Committee to hear from them directly on what direction from the United States would be helpful to their governments in order to move in the right direction.

The CHAIRMAN. Okay. Thank you.

Do any of the Committee members have any final questions for our witnesses? No? Thank you.

Well, we thank you so much. When Speaker Pelosi created the Select Committee on Global Warming, I never thought that our travels would actually bring us over to the Senate side for a hearing, which is about as distant, actually, from the other side of the Capitol as you can get. So I would like to thank Senator Kennedy for making this hearing room available to us.

It was a very congested afternoon in the United States House of Representatives to do anything other than this already predetermined business. And so I think that what we have learned here today, and which each of you have pointed out quite eloquently, is that deforestation is something that if we can develop a strategy can pay huge dividends in the battle against global warming.

And as the gentleman from Washington State made reference to, that along with things like energy efficiency, it just is all part of the strategy of working smarter, not harder. The assets are there. If we think about it in a very strategic way we can derive tremendous benefits from it.

We thank you for the dedication that you have made to this issue for your lifelong commitment to these issues, and we hope that we can work with you in the next year, because Speaker Pelosi is committed to passing a mandatory cap and auction and trade bill. And this issue of deforestation is obviously going to have to be a central part of any strategy which we adopt nationally.

So we thank you. We apologize for the long intercession, but it was unavoidable.

With that, this hearing is adjourned. Thank you.

[Whereupon, at 4:54 p.m., the Committee was adjourned.]

Lovejoy Responses:

My responses are below:

1) Where are we in terms of assessing forests around the world and knowing which are in fairly good condition and which are experiencing degradation at an alarming rate? Do we have an accurate inventory?

The short answer is there is no annual estimate made of changes in forest, although individual countries such as Brazil (as contrasted to the rest of the Amazon) produce reliable annual figures. FAO figures are well known to be unreliable as they mostly are a mosaic of individual government reports.

Current satellite platforms do have the ability to observe major land use changes globally, with pixel sizes of 20x20m to 30x30m. There are Landsat class instruments on NASA's Landsat 5 satellite, SPOT (French) and SBERS (Brazil-Chinese) satellite, and ALOS (Japanese). NASA's Landsat 5 will wink out in the very near future and not be replaced until around 2011 so all data will be collected in that interval from non-US satellites. Ground observation and and aircraft are used as well.

Satellites most easily monitor land conversion due to fire and deforestation. Forest damage due to insects, disease, drought and storm damage are often of finer scale (although they can be large in the aggregate) and harder to monitor

Clearly there is a need to get to reliable annual figures of change in forests (and carbon) on a global scale.

2) How good is the scientific data on how much carbon is sequestered by forests, by the various types of forests, and how changes in deforestation affect the global climate?

The data tend to lack a lot of precision, but there is enough approximate information to allow rapid inclusion of forests in addressing greenhouse gas emissions and concentration in the atmosphere.
Rapid progress is being made combining information and ecosystem models to estimate carbon dynamics related to forests.

Further work needs to be done to understand (and thus manage) other important aspects of forests (e.g., albedo,, exchange of water vapor and other greenhouse gases.)

3) In 1990, the IPCC said that deforestation is responsible for about 20% of global CO2 emissions. Do you think that this figure has increased or declined?

The figure will vary from year to year depending on the absolute amount of deforestation and the absolute amount of emissions from fossil fuel combustion. The latter has certainly been rising. So whether the percentage in any given year probably varies a bit. The real point is that it is large enough that global management of the forest part of

the carbon cycle is one the seven or so main elements in a greenhouse gas reduction strategy

4) A recent article in Science Journal discussed a study that suggested the large increase in bio-fuels will have negative greenhouse gas impacts worldwide when incorporating land-use changes, particularly in deforestation to plant more crop land. What role do you think bio-fuel mandates play in rainforest degradation?

At this point the impact of biofuels on the scale of tropical deforestation is probably greatest in those areas such as Malaysia where there is a lot of oil palm being grown. Soybeans for biodiesel could be a problem but it is not that promising as a biofuel, especially compared to sugar cane. So far Brazil grows most of its sugarcane in a relatively small area in (already deforested)southern Brazil. It may not grow as efficiently in the Amazon but it could grow there.

The main point is that biofuels have a contribution to make to a new energy mix but the details of what, where and how it is grown is very important.

5) Is it true that forests in the United States are also net carbon sinks because the annual growth exceeds the annual harvest? Would you recommend that we actively increase the growth as well as encouraging it in other countries?

United States forests are still estimated to be net carbon sinks, primarily because of regrowth of forest in the northeast and U.S. intermountain west. Fire suppression in the west in the last 50 years has added to the sink. But fire, drought and insect pests can change that balance. For example forest mortality in parts of the southwest have been substantial in the past decade. In the future, biofuels from forests could affect the carbon sequestration depending on the forest product sources and how they are grown.

6) After a forest fire in a rainforest area, what actions need to be taken to make sure that we accelerate the return of a healthy forest to that area? How are they different from what we might do in a forest fire area in the US?

Probably the most important thing to do is prevent occupation of the land by providing appropriate incentives for different activities. Forest fires have traditionally been rare in rain forests because they maintain so much mooisture. As the forest is broken up, however, it can get drier and an initial fire may leave a forest standing but lead to subsequent mortaility that makes the forest more vulnerable to fire than before. Again probably the most cost effective solution would be to provide alternatives to local people so they don't use fire, or are properly trained in its use.

7) How does forest fire management differ in international

countries? In the case of rainforests, does thinning out undergrowth make sense to keep fires under control?

Thinning undergrowth is not useful or necessary in tropical rain forest as it's very moisture is a deterrent. Plant mortality caused by a fire might suggest thinning as an alternative, but again it will be cheaper just to keep people away and let the forest heal itself.

8) What role do indigenous peoples play in deforestation?

Indigneous people generally are protectors of the forest, and the deforestation they do cause is amll scale slash and burn which is pretty much steady state.

9) Based on the amount of carbon that forest fires release into the atmosphere, do you think it is fair to say that a forest fire anywhere in the world can constitute a global warming emergency? And as a follow up question, would it require any new technology development for us to work on this problem right now as a preventative measure?

If a forest fire is likely to be followed by forest regrowth, it will in the end not be a net (even if temporary) contributor to the atmosphere.
It is the forest fires that lead to permanent deforestation that should be the matter for real concern. I personally believe the Amazon forest is not far from a point where further deforestation could trigger degradation of the hydrological cycle making the forest drier and more vulnerable to fire

Response of Stephanie Meeks, Acting President and CEO of The Nature Conservancy to questions posed by the House Select Committee on Energy Independence and Global Warming April 14, 2008

1) **Where are we in terms of assessing forests around the world and knowing which are in fairly good condition and which are experiencing degradation at an alarming rate? Do we have an accurate inventory?**

Coarse monitoring methods have found that the highest rates of tropical forest degradation, like deforestation, are occurring in Southeast Asia, followed by central Africa, and Latin America. However, we simply do not have an accurate global inventory of forest degradation because, until recently, the major causes of degradation such as selective logging have been invisible to large scale satellite monitoring. A recent breakthrough in methods for analyzing U.S. satellite images (Landsat ETM) makes it possible to implement an accurate global inventory, and to conduct regular monitoring of areas of concern. Already, an inventory of selective logging activity has been conducted for large portions of the Brazilian Amazon region, finding that logging in this region (1) covers a larger area than outright deforestation does, (2) accounts for an additional 25% of carbon emissions above the emissions when only outright deforestation is considered, and (3) is a strong catalyst for subsequent deforestation. Similar studies in Africa and Southeast Asia, where degradation is more intense, have not been conducted. Continued U.S. government support of the Landsat series sensor is critical for global forest monitoring.

2) **How good is the scientific data on how much carbon is sequestered by forests, by the various types of forests, and how changes in forestation affect the global climate?**

While the technology and methods exist to achieve high levels of accuracy everywhere for both sequestration and emissions of carbon from forests, we currently have high accuracy results in some locations but not others. Limited investments in field inventory data collection, as well as analysis of remote data, limit the accuracy of forest carbon accounting in many developing countries, thus limiting the accuracy of global forest estimates. The accuracy of global estimates is rapidly improving, yet more investment is needed to build capacity for forest carbon accounting in developing countries. Extensive forest inventory networks such as in the United States, and wall-to-wall remote sensing imagery analysis such as in Australia, provide exportable models for other countries.

Given existing data, REDD credits can be credibly traded by requiring sellers to assume the lower end of the error range for a given location. This is a conservative approach and it creates an incentive for better data where uncertainty is high.

3) **In 1990, the IPCC said that deforestation is responsible for about 20% of global CO2 emissions. Do you think that this figure has increased or declined?**

The IPCC Third Assessment Report (IPCC 2001) estimated that deforestation in the 1980s emitted 6.2 billion tons of CO_2 per year (minimum 2.2, maximum 9.2) and that fossil fuel combustion emitted 20 ± 2.2 billion tons of CO_2 per year. The IPCC Fourth Assessment Report estimated that deforestation in the 1990s emitted 5.9 ± 4 billion tons of CO_2 per year and that fossil fuel combustion emitted 23 ± 1.5 billion tons of CO_2 per year. So, the increase in emissions from fossil fuels lowered the fraction of total carbon dioxide emissions from deforestation from ~24% to ~20%. For all greenhouse gases, IPCC estimates that deforestation contributed ~17% of total emissions in 2004.

Because of forest fires, agricultural clearing, hurricanes, pest infestations, and other disturbances, the carbon balance of forests varies over the seasons and from year to year. Specific policies and changing economic and political conditions can also change pressures on forests. For example, global increases in corn prices seem to be increasing the threat of deforestation in the rainforests of Brazil.

4) **A recent article in *Science Journal* discussed a study that suggested the large increase in bio-fuels will have negative greenhouse gas impacts worldwide when incorporating land-use changes, particularly in deforestation to plant more crop land. What role do you think bio-fuel mandates play in rainforest degradation?**

Biofuels are a contributor to deforestation in the tropics, though the precise magnitude of their present contribution is not clear. What is clear is that a significant expansion of biofuel mandates above current biofuel consumption threatens to add to the deforestation of tropical rainforests.

For instance, Indonesia is experiencing one of the highest rates of deforestation of any nation in the world, and oil palm production is a principal cause. Indonesia's palm oil production has been and continues to be driven primarily by food and industrial uses. Nevertheless, the burgeoning demand for biofuels has increased interest in conversion of palm oil to biodiesel, placing additional pressure on palm oil prices and increasing demand for land conversion. Last year, the Indonesian government reported that proposals to develop biofuels in Indonesia, including construction of several refineries to produce biodiesel from palm oil, were attracting $17 billion in planned investment.

Deforestation in the Amazon has not been as directly linked to biofuels demand and policy. However, many researchers contend that Amazonian forest lands that have been converted to cattle ranching are moving into soy production as the result of very high global prices for soy beans. This price spike may have been caused in part by a decrease in U.S. soy production to make room for corn acreage in response to the U.S. biofuel mandate included in the Energy Policy Act of 2005 and the need to replace MTBE as an octane enhancing agent in gasoline. Although soy production in the Brazilian Amazon is relatively limited, accounting for perhaps 2% of cleared land area, it is expanding rapidly with acreage increasing at an average 16.8 percent per year since 2000. Vigilance is required to ensure biofuels never becomes a driver of deforestation in the Amazon.

Conversion linked to biofuels produced in Brazil may have the potential to be an important short-term threat in the Cerrado grasslands of central Brazil and the Atlantic Forests of southern Brazil. These are less well known internationally than the Amazon, but are also threatened. Although some portion of the Brazilian sugarcane crop is grown in regions that had previously been part of the Atlantic Forest, it does not appear that sugarcane ethanol is a principal cause of deforestation at this time.

5) **Is it true that forests in the United States are also net carbon sinks because the annual growth exceeds the annual harvest? Would you recommend that we actively increase the growth as well as encouraging it in other countries?**

Currently, the forests of the U.S. constitute a net carbon sink equivalent to 600 million tons of CO2 per year in 2005.[1]

U.S. forests are a net carbon sink because biomass gained through growth exceeds losses to timber harvests and mortality by 33%.[2] Losses to timber harvests are three times the losses to mortality. The currently large growth rate of U.S. forests derives from the regrowth of large areas of forest cleared for agriculture from approximately 1850 to 1920.[3] This one-time source of forest growth is slowing and U.S. forests could revert back to becoming a net source of greenhouse gas emissions.[4]

In certain forest types, there are forest practices (pre-commercial and commercial thinning, shifting rotation lengths, etc.) that can lead to greater biomass growth, thereby increasing carbon sequestration. To identify areas where such activities are appropriate and effective requires careful analysis and planning. These types of practices should generally be applied with the overall objectives of restoring and maintaining native ecosystems, and should not be applied in previously unmanaged areas, such as old-growth forests and wilderness areas.

In other areas (e.g., forests that were converted to agricultural lands in the past), there also may be opportunities to reforest with native species to help restore native forest systems and increase the carbon sequestration potential of those lands.

6) **After a forest fire in a rainforest area, what actions need to be taken to make sure that we accelerate the return of a healthy forest to that area? How are they different from what we might do in a forest fire area in the US?**

Around the world, forests may exhibit different responses to fire. Fire-dependent habitats are those where most of the species have evolved in the presence of fire, and where fire is an

[1] United States Environmental Protection Agency (US EPA). 2007. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005. US EPA, Washington, DC.
[2] Smith, W.B., P.D. Miles, J.S. Vissage, and S.A. Pugh. 2007. Forest Resources of the United States, 2002. United States Department of Agriculture, Forest Service, St. Paul, MN.
[3] Smith, W.B., et al. 2007. And United States Climate Change Science Program (CCSP). 2007. The First State of the Carbon Cycle Report: The North American Carbon Budget and Implications for the Global Carbon Cycle. National Oceanic and Atmospheric Administration, Asheville, NC.
[4] CCSP. 2007.

essential process for conserving biodiversity. Fire-sensitive habitats are those where most of the species have not largely evolved in the presence of fire. An example of the latter is tropical moist broadleaf forests where, in many cases, the introduction of fire can have an extensive negative impact on biodiversity.

The vast majority of fires in tropical forests are caused by agricultural activities, i.e. escaped burns from agricultural fields, escaped or uncontrolled burns for grazing, and fires intentionally set to clear forests, usually after they are opened up by various forms of logging. Return to a healthy forest after a forest fire in tropical rainforests involves keeping subsequent fires out of these forests. The problem is, once these forests burn they become more flammable due to the increase in fuel from vegetation killed by the fire, from more sunlight reaching the forest floor and drying out the fuel, and from the increased sunlight allowing the invasions of flammable grasses and ferns. A positive feedback loop is formed, in which fire leads to changes in microclimate and flammability, which in turn leads to more fire. After only a few fires, the forest is lost. It is a difficult cycle to stop.

By contrast, in the U.S. the vast majority of forests are fire-dependent, requiring fire at some frequency to persist and thrive. Healthy, fire-dependent forests that experience fires with parameters (severity, intensity, season, etc.) that fall within some natural range of variation are said to have "intact fire regimes." Various land management practices, climate change, non-native plant species, and excluding fire can alter fuels and fire regimes. From an ecological standpoint the post-fire actions needed to restore forests that experience fire depends on the condition of the forest and its fire regime and also on the type of fire. In many cases, no actions will be necessary. There are, however, social and economic considerations (e.g., community safety) that need to be weighed against ecological concerns when planning post-burn restoration actions.

7) **How does forest fire management differ in international countries? In the case of rainforests, does thinning out undergrowth make sense to keep fires under control?**

In many countries around the world, fire management is community-based and to be effective requires incentives for the people to want to protect the forests. In the U.S., fire management is more command and control by technologically sophisticated fire management agencies. Across much of Latin America, the emphasis should be on community-based fire prevention incentives

and community fire brigades to deal with fires when they do occur. Most countries do not have the capacity nor the resources to effectively fight fires. In addition, many prevention programs do not address the underlying causes of fire, i.e. people needing to burn to maintain their livelihoods.

Thinning out undergrowth in tropical rainforests does not make ecological sense. These are fire-sensitive forests with no adaptations to survive even very low intensity fires. Fires in tropical rainforests, when they do occur, tend to be very low-intensity, yet very destructive. Removing understory vegetation would change the dynamics of these forests, affecting regeneration, nutrient cycling, and biodiversity. Any opening of the forest, even the understory would subject the forest to invasion by flammable grasses, which would produce higher-intensity, even more destructive fires.

Traditional tropical forest harvesting creates the same effects as fire – increased fuel load and greater canopy opening. Sustainable forest management techniques such as controlled intensity of logging and good harvest practice such as directional felling and planned extraction routes reduce canopy opening and fuel load. The Conservancy's support of forest certification aims to bring market pressure to bear to ensure adoption of best practice.

8) What role do indigenous peoples play in deforestation?

Many of the world's most critical habitats still exist today due to the traditional knowledge and effective conservation strategies practiced by indigenous groups. The growing recognition of the strong conservation stewardship role played by indigenous groups has resulted in a doubling of the forest area over the last fifteen years that communities and indigenous people own and administer. As of 2002, this amounted to over 380 million hectares - an area almost seven times the size of France. The eight countries of the Amazon Basin now recognize indigenous people's rights to territories covering over 100 million hectares. Countries as diverse as Australia, Canada, Malaysia, Russia, and the Philippines have recently taken major steps in the same direction. In developing countries, indigenous people and local communities own or officially manage 22% of all forests, compared to only 3% in developed countries.

According to a recent study[5], indigenous people in Nicaragua's Bosawas Reserve clear dramatically less forest than their non-indigenous neighbors, due principally to their tribal culture's deep respect for nature and the fact that they have lived in the forest for thousands of years without destroying it. Indeed, on average, each non-indigenous farmer cleared nearly 17 times more forest in 2002 than their indigenous counterparts.

According to Center for International Forestry Research (CIFOR), careful examination reveals that complex, indirect forces are often more important than the logging and slash and burn activities popularly understood as the main causes of deforestation. Forces such as fluctuations in international commodity prices; agricultural and, more recently, biofuel subsidies; and roads and other infrastructure projects can encourage forest clearing.

Although indigenous peoples have gained land rights and their lands often act as a barrier to land use change, they are increasingly pressured by competing demands for their land be it for oil and gas, ranching or other development needs. It is important to note that indigenous peoples are more adversely affected by deforestation than other population groups. If there are not urgent measures to support them in their efforts to effectively conserve their lands there may be rapid disintegration of the cultures and the forests on which they depend. From engagement in policy debates on compensation for environmental services or infrastructure development, to satellite based vigilance systems through incorporation of modern know-how to their traditional knowledge, the indigenous peoples need support to be able to determine their own future in the modern world. Strengthening management capacity including threat abatement and guaranteeing sustainable finance are issues common to indigenous lands and the traditional park systems.

9) **Based on the amount of carbon that forest fires release into the atmosphere, do you think it is fair to say that a forest fire anywhere in the world can constitute a global warming emergency? And as a follow up question, would it require any new technology development for us to work on this problem *right now* as a preventative measure?**

No. Many, if not most forest fires are carbon neutral. More than half of the world's ecosystems depend on fire for their existence. Most of the species in these forests have adapted to either survive fire or respond reproductively to it.

[5] Stocks, A., B. McMahan, and P. Taber. 2006. Beyond the Map: Indigenous and Colonist Impacts and Territorial Defense in Nicaragua's Bosawas Reserve.

A common example is the world's many pine forests that are maintained by frequent, low-intensity fires that burn through grasses and leaf litter on the forest floor. The larger trees are unaffected and their reproduction is stimulated. The grasses, forbs and shrubs in the understory are not killed and will re-sprout. Root systems, which store large amounts of carbon, are unaffected by the fire. What is burned in these fires? Grasses and dead leaf litter, which when they burn are immediate inputs of carbon to the atmosphere. But, let's say that this is a pine forest naturally adapted to fires recurring every three years. Within three years the grass, shrubs and tree growth (producing leaf litter) have recaptured all the carbon that was released three years before. Thus, over time, these ecosystems are in steady state with respect to carbon, i.e. they are carbon neutral. If the trees in the forest are relatively young, the forests can be carbon sinks because the trees are actively storing carbon in their trunks and branches as well. Preventing fires in pine forests or other fire-dependent ecosystems, or not managing them with prescribed fire, leads to dense forests and huge fuel loads which will eventually burn and release huge amounts of carbon, kill all vegetation, damage soils, reduce productivity, and reduce water quality.

The same situation exists in intact boreal forests, but over a longer time frame. These forests are maintained by fires that recur every several hundred years. A lot of carbon is released from one of these fires, but during the fire-free years all of that carbon is recaptured by the re-growing forest. The problem in both of these situations (pine forest and boreal forest) is when there is forest conversion, i.e. the forest is lost due to other activities and changes in land use. If the forests are maintained with intact, ecologically appropriate, fire regimes, they are carbon neutral (and carbon sinks if they have not reached steady state).

The need is for incentives to prevent the loss of forests to other land uses.

10) In your testimony you express your support for a cap and trade system. Cap and trade is not required in order for us to work on deforestation is it? The only thing that is really required is money, isn't that correct?

If we are to successfully slow and stop emissions from tropical deforestation, mechanisms must be established that create value for conserving standing forests. This is the only way to compete against the economic forces that currently value cutting or burning forests more than

leaving them standing. The magnitude of the deforestation challenge requires that all financial instruments be brought to bear. We believe that market incentives, structured effectively, offer the greatest potential to drive investments to reduce deforestation. Well-structured market approaches will also provide an accountability element in that they would be structured on a pay-for-performance basis; payments would be made after emissions reductions from avoided deforestation have been demonstrated, using reliable accounting and measurement systems. A U.S. cap-and-trade system which allows credits for forest carbon activities, both national and international, to be used against the compliance cap is the most effective way to establish such incentives. Credits under a U.S. cap-and-trade system should be complemented by other financial instruments, including targeted official development assistance from bilateral and multilateral agencies and other sources, debt-for-nature swaps, and taxes on carbon intensive commodities or services.

11) If we are going to use forests as carbon credits in a cap and trade system, how do we make certain that we count them only once in the process and that a preserved area does not get deforested later – after they enjoy the funds from being used as a credit?

As with the electric power, industrial and transportation sectors, the objective of efforts to reduce emissions from deforestation and forest degradation is to reduce the emission rates from the activity over time. The objective in all of these sectors is to slow the rate of transformation of carbon – whether stored in the ground as fossil fuels or stored in standing forests – to carbon dioxide in the atmosphere. Reducing emissions from deforestation avoids or delays some amount of this transformation as does reducing emissions from the combustion of fossil fuels. In both cases, the possibility remains that the stock of carbon – whether in a forest or in a seam of coal – could subsequently be transformed to carbon dioxide. The goal of climate policy is to regulate and, over time, diminish the rate of transformation and thereby slow the rate at which atmospheric concentrations of carbon dioxide accumulate. Ultimately, this will be essential to stabilizing atmospheric concentrations to avoid the worst impacts of climate change.

As an example, Indonesia's rainforests are being deforested at a rate of 4.6 million acres per year, releasing as much as 280 million tons of CO_2 to the atmosphere. Reducing this rate of deforestation is of unambiguous gain to the atmosphere. A policy that reduces the annual rate of deforestation by 2 million acres would be of long-term and perhaps permanent benefit to the

atmosphere as long as the amount of forest loss in subsequent years does not rebound to levels above the original rate of deforestation.

As a practical matter, if significant reductions in forest destruction were achieved and maintained over time it is unlikely that a subsequent fire or other occurrence would quickly overtake these benefits. As a policy matter, the best way to assure that gains in forest preservation are not reversed is to put in place an international policy architecture that commits the major tropical forest nations to preserving declines in deforestation, just as it should commit the developed countries to maintain national emissions limits.

12) Are there currently any policies that stand in the way of your work? Or would you characterize the deforestation issue as one that just requires funding?

Although funding from both markets created by cap-and-trade systems and traditional overseas development aid is a key element to an international response to tropical deforestation, environmental, land use, and even trade policies are also critical to effectively slowing tropical deforestation. For example:

- Policies that drive demand for first-generation biofuels (e.g., biofuels made from corn, soy and oil palm) have the potential, through their effect on prices for agricultural commodities, to encourage deforestation. Increases in land prices resulting from these policies also make it more difficult to undertake reforestation projects, both here in the U.S. and in other countries.
- Some lending activities of the major development banks could lead to deforestation if not managed properly. For instance, the International Finance Corporation – a private sector arm of the World Bank Group - is funding infrastructure and agricultural processing facilities (meat packing plants) on the edge of the Amazon that may make it easier to move crops and meat grown on deforested lands to world markets. Efforts are underway to reduce the impact of these practices.
- Policies that allow products derived from illegally harvested timber to enter U.S. markets also contribute to the problem. Amending the Lacey Act to make it illegal to knowingly import, market, distribute, and/or sell products derived from illegally harvested timber would help significantly reduce deforestation.
- Policies and practices that restrict the transfer of agricultural technology and/or knowledge that would allow developing countries to intensify their agricultural practices

and therefore convert less land to agriculture further contribute to deforestation rates in developing countries.

In short, while funding is an important element--and opening U.S. carbon markets to REDD credits is an efficient way to generate that needed funding while also establishing pay-for-performance accountability measures--there are many complementary policies that would also significantly reduce deforestation.

13) When you look at a project, do you have specific standards in mind, such as species protection, watershed needs, etc or do you just work with whatever forest is available? What I am getting at here is how do we know which forest area is most important to the ecosystem if funds are short and we can't afford to pay for everything?

Yes, we do have specific standards. We have identified priorities for forest conservation based on our objective to protect 10% of every major habitat type on earth by 2015. Forest types that are under-represented globally and are at risk are given highest priority. We conduct intensive scientific analyses at multiple scales (regional, ecoregional, and local) to identify these conservation priorities. And within each forest type, we prioritize conservation of the most important "targets," or elements of the system, whether those are species or whole natural communities. We are also increasingly considering how ecosystem services (e.g. carbon, water quality, flood control) can dovetail with our conservation planning and provide benefits to both people and nature. We define "effective conservation" priorities as the nexus of viable biodiversity, acceptable threat levels, and adequate conservation management status.

14) What is the funding outlay for the Nature Conservancy's preservation projects in rain forest regions?

The Nature Conservancy works in 24 countries and one U.S. state (Hawaii) that contain rainforest. Our total outlay for operations and capital expenses in those countries and Hawaii was approximately $162 million over the last three fiscal years ($53.1 million in FY05; $51.7 million in FY06, $56.9 million in FY07). Given the high biodiversity of rainforests and their importance to our mission, much of our investment in those countries is for rainforest protection; however, the Conservancy works in all of the major habitat types and therefore some

of the expenditures summarized in the figures above represent conservation work focused on the protection of other habitat types, such as grasslands, wetlands, coasts, and marine ecosystems.

15) Would you characterize your projects as reforestation or prevention of deforestation?

The Nature Conservancy works on both reforestation and the prevention of deforestation.

The Conservancy has more on-the-ground experience in implementing forest carbon sequestration projects through reforestation in the United States and Latin America than any other environmental organization. Two of our largest projects are in the Lower Mississippi Delta and in the Atlantic Forest of Brazil.

- The Lower Mississippi Delta project has a goal of restoring 500,000 acres of forests in the Tensas River Basin on what is currently unproductive farmland as part of a program to sequester 150 million tons of CO_2 over 70 years. The first part of this project includes 47 acres that will sequester 12,690 metric tons of CO_2 over 70 years for the first offering of TNC's voluntary carbon offset program.
- The United Nations Educational, Scientific, and Cultural Organization (UNESCO) recognizes Brazil's Atlantic Forest as one of the highest conservation priorities in the world because of its incredible diversity and high threat level. The Conservancy's climate action projects seek to protect 50,000 acres of this forest in Southern Brazil. Over 40 years, we expect the project will sequester significant amounts of CO_2 while making an invaluable contribution to the preservation of biodiversity in this critical region.

On the avoided deforestation side, The Nature Conservancy has implemented five large-scale REDD projects in Belize, Bolivia, and Brazil that have reduced and continue to reduce emissions from deforestation while also protecting almost 1.8 million acres of forest land. The largest of these projects, the Noël Kempff Mercado Climate Action Project, included formally expanding the Noël Kempff Mercado National Park in Bolivia; ending logging in concessions within the park expansion area; and stopping conversion of forest to marginal ranchland and row crops through assistance in land titling for indigenous communities located adjacent to the project area, a sustainable development program for local communities, and strengthened park protection. This project demonstrates that activities to reduce deforestation in developing countries can provide real verifiable emissions reductions.

16) What are the challenges of convincing countries to go along with conservation? Are the problems primarily economic or cultural?

The level of commitment toward conservation in developing countries varies greatly across countries and circumstances. Some common obstacles to improved conservation include: lack of enforcement capacity; weak environmental ministries, agencies, and institutions; unclear land tenure rights; perverse incentive structures in national and international policies and markets; and a focus on economic development goals without due consideration of conservation objectives. An overriding concern in all countries, however, is the lack of an economic value for the carbon stored in standing forests.

17) Do you support sound forest management practices such as replanting after a fire, clearing underbrush and selective harvesting here in U.S. forests?

It is The Nature Conservancy's position that forest management can be compatible with biodiversity conservation, if carried out appropriately. First, careful analysis and planning are critical to identify areas that should be protected and those that are appropriate for management and harvest. Within the latter category, more analysis and planning are needed to ensure that management practices and silvicultural regimes are based on maintaining and restoring ecosystem functions and processes, including natural disturbance regimes such as fire.

As such, The Nature Conservancy supports, advocates for and engages in a wide range of sound forest management practices, including the following practices, *where appropriate*, for a particular fire regime and/or ecosystem. The Nature Conservancy supports the use of mechanical fuels reduction treatments where they provide the opportunity to reduce severe fire risk, restore forest health, and stimulate the local economy. In severely burned areas, we support replanting with native species to safeguard watersheds from erosion and invasive species. The Conservancy generally does not support post-fire selective harvesting, also known as salvage logging, which can damage vulnerable systems, remove snags and coarse woody debris important for wildlife, and impede natural regeneration.

Where management activities are taking place, we strongly recommend third-party certification of forest practices. Forest certification is a means to ensure that harvesting is carried out in an

ecologically sound and socially beneficial manner. Certified forestry can be a valuable part of any comprehensive strategy aimed at effective conservation of forested landscapes.

18) You state on page 9 of your testimony that, "Brazil has indicated the intent to develop an Amazon-wide REDD program." Do you know what their timeline is for actual implementation?

The Government of Brazil announced the Amazonian Fund REDD proposal for the Amazon in Bali, December 2007 in an official side event during the UN Climate Change Conference. The proposal starts with the Amazon and is planned to be expanded to a nation-wide mechanism by 2010. The fundamental aspect of the proposal is to reward the Brazilian government for concrete results in reducing deforestation. By the end of each year, deforestation and consequent carbon emissions are calculated and Brazil will ask for private and public investments into the Amazonian Fund to continue pursuing emissions reduction. The Brazilian National Bank for Social and Economic Development will be the finance agent of the Fund. The legal framework for the fund is expected to be published this month.

19) You state on page 10 of your testimony that proposed REDD financing come from either market-based approach (i.e. carbon offsets) or non-market (i.e. carbon taxes). Isn't this really just a transfer of wealth and jobs from the US to other nations?

REDD financing is not strictly a transfer of wealth from the U.S. to developing countries; it is a transaction in which both parties gain something of value. Developing countries receive sustainable financing for providing services that the world values as well as improved local livelihoods and increased biodiversity. U.S. entities will gain credits for emissions reductions that can be used to meet compliance requirements. Moreover, the protection of tropical forests generates a wide variety of benefits that standing tropical forests offer (medicines, food, regulated rainfall patterns, etc). Furthermore, including incentives in U.S. legislation to sustain and increase carbon storage in tropical forests is critical to reducing the approximately 20% of total global greenhouse gas emissions that come from deforestation and forest degradation and thus to combating climate change effectively.

Incorporating REDD into international agreements will also allow major developing country emitters to participate proactively in global climate change mitigation, and may thus facilitate

pathways to more global solutions. The U.S. is responsible for the largest share of any country--about 30 percent – of the historical greenhouse gas emissions that are contributing to the climate change we are already experiencing today and that will continue to change the climate for coming decades. Consequently, it will be essential for the U.S. to undertake emissions reductions here in the U.S. and support activities outside the U.S., such as REDD and technology transfer, if the developing countries are to join in the solution to climate change. A framework that engages all major emitters, developing and developed, will be essential to avoid the worst impacts of climate change.

20) The Noel Kempff project in Bolivia ended logging in the expanded park. Did this increase the amount of illegal and unregulated logging in other parts of Bolivia?

The Noël Kempff project prevents the release of carbon to the atmosphere through actions to 1) reduce logging and avoid the associated carbon emissions and 2) reduce conversion of forest to other land uses and avoid the associated carbon emissions.

The Conservancy and our project partners designed the Noël Kempff project with specific attention to addressing the risk of leakage (i.e., shifting of logging and land conversion and associated carbon emissions to areas adjacent to the park and to other parts of Bolivia).

Our approach to addressing leakage includes monitoring for an increase in the amount of regulated logging in timber concessions across Bolivia through the application of a model of Bolivian timber markets, which relies on official timber statistics. We do not currently monitor for increases in illegal and unregulated logging outside of the Noël Kempff project area, because at the time the project was developed, there was no method to monitor illegal and unregulated logging. Recently, however, a methodology was developed to monitor illegal and unregulated logging using remote sensing techniques. We have plans to apply that methodology to the Noël Kempff project as we continue to pioneer new techniques in the project.

21) Would you support a forestry management system that included replanted trees in tropical forest and/or national parks which would be guaranteed to grow around 30 to 40 years before they are harvested and then replanted again?

We would not support the conversion of mature forest ecosystems to intensively-managed plantations. Based on the best available science, the carbon debt (emission) incurred from deforestation cannot be made up for in a reasonable timeframe (50-100 years) by carbon sequestration realized through intensive plantation management.

Where this forest management system involved conversion of lands from an agricultural use, with the proper carbon accounting, taking into account the discontinuous nature of forest carbon stocks subject to repeated harvest, this could be a legitimate strategy and is in fact already recognized by the Clean Development Mechanism under Kyoto.

22) In your testimony, you state, "In 2007, Indonesia took a leadership role in the global dialogue on REDD." However on page 12 of your testimony, you state, "100% of log exports and 55% of plywood exports from Indonesia are illegal." How can we trust Indonesia will not take the money from carbon offsets and still "allow" illegal logging?

The goal of an international REDD program is to reduce carbon emissions from forest loss, not specifically to reduce illegal logging. Nevertheless, a reduction in illegal logging is a likely outcome, and special attention should be paid to making sure these objectives are mutually reinforcing.

An effective REDD mechanism would "pay for performance," where performance can be transparently assessed, based on pre-agreed criteria and third-party monitoring of forest carbon emissions over time. It will be important to be able to effectively monitor deforestation and degradation, both legal and illegal, and to account for it within a national accounting framework. Payments for carbon offsets would not occur unless real, verifiable emissions reductions take place.

Indonesia, therefore, will have a strong financial incentive to reduce forest loss in the most effective ways it can. Given the amount of forest loss from illegal logging occurring in

Indonesia, combating illegal logging and illegal forest conversion would be very high on the list of priority strategies to receive carbon offset payments.

A system of effective forest governance should largely be established before performance payments can be earned, and countries may need up-front financing for REDD program development. There may also be opportunities for lenders or donors to develop REDD credibility triggers, or requirements that countries make commitments to illegal logging interdiction and related topics, that would give increased confidence that illegal practices were being tackled together with overall reduction of forest emissions.

The tools for reducing illegal logging do exist in Indonesia. In recent years, Indonesian corporations, government agencies and international NGOs, including The Nature Conservancy, have worked to develop a timber legality standard, which clearly defines what timber comes from legal sources. With this standard in place, it is now possible for an independent auditor to verify the legality of an Indonesian forest product destined for the export market, where before this would have been nearly impossible. Combined with an effective log tracking system and inter-governmental agreements to maintain the integrity of the chain of custody, this system can work. The satellite and ground-based monitoring framework required for a REDD program can also be linked to illegal logging interdiction efforts.

23) Should the US re-open public land to logging to combat this flood of illegal wood shipments?

The United States – the largest consumer of wood and wood-based products globally – should definitely be considering the ecological and social impacts of our consumption of forest products. We should be advancing policy frameworks and market mechanisms that can improve forest management practices around the globe, especially in places where illegal and unsustainable logging are commonplace. Such policies and market approaches can also help level the forest products trade playing field. (Right now, illegal logging costs U.S. wood product companies more than $460 million a year in lost export sales.) Forest certification is a key tool that The Nature Conservancy promotes (and uses on our own lands) to ensure that forest management is carried out in an environmentally and socially responsible manner, in the United States and internationally.

Domestically, the statutes and planning processes that are currently used to determine areas of public lands that are and are not appropriate for timber harvesting should remain strong and in place. In general, The Nature Conservancy believes that harvesting activities should not expand into previously unmanaged forests.