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LEGISLATIVE HEARING TO CONSIDER THE FOLLOWING ITEMS: S. 810, GREAT APES PROTECTION ACT OF 2011, S. 1249, TARGET PRACTICE AND MARKSMANSHIP TRAINING SUPPORT ACT, S. 2071, PERMANENT ELECTRONIC DUCK STAMP ACT OF 2012, S. 357, WILDLIFE DISEASE EMERGENCY ACT OF 2011, S. 1494, NATIONAL FISH AND WILDLIFE FOUNDATION REAUTHORIZATION ACT OF 2011, S. 1266, DELAWARE RIVER BASIN CONSERVATION ACT OF 2011, S. 2156, MIGRATORY BIRD HABITAT INVESTMENT AND ENHANCEMENT ACT, AND S. 2282, NORTH AMERICAN WETLANDS CONSERVATION EXTENSION ACT OF 2012

HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND WILDLIFE

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

APRIL 24, 2012

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ONE HUNDRED TWELFTH CONGRESS
SECOND SESSION

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TUESDAY, APRIL 24, 2012

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON WATER AND WILDLIFE,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10:15 a.m. in room 406, Dirksen Senate Office Building, Hon. Benjamin L. Cardin (Chairman of the Subcommittee) presiding.

Present: Senators Cardin, Inhofe, Carper, Lautenberg, and Udall.

OPENING STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Senator CARDIN. The Committee will come to order.

Let me welcome you all to the Subcommittee hearing of Water and Wildlife of the Environment and Public Works Committee. I want to thank Senator Boxer for permitting the Subcommittee to hold this hearing today on a subject I think is important to many members of the U.S. Senate. We are taking up several bills.

I want to thank Senator Sessions, who will be here shortly, the Ranking Republican Member of the Subcommittee on Water and Wildlife, for his help and cooperation, and Senator Inhofe for his help.

With today's hearing we have the opportunity to discuss a set of critical issues to protecting the Nation's wildlife. The Subcommittee

will consider seven bills. I would like to thank my colleagues who have worked so hard to craft the bills that are before us today. I see Senator Udall and Senator Begich who are here, and I want to thank them for their leadership on these issues.

Among the bills we will address are the use of chimpanzees in medical research, a bill that would focus Federal attention and resources on diseases like white-nose syndrome in bats that are devastating an entire animal population—I want to thank Senator Lautenberg for his strong leadership on that particular issue—and several bills to provide critical support for wildlife conservation and habitat protection.

Three of the bills we are considering today directly establish or reauthorize conservation programs; S. 1494, the National Fish and Wildlife Reauthorization Act, S. 1266, the Delaware River Basin Conservation Act, and S. 2282, the North America Wetlands Conservation Reauthorization Act.

As we attempt to balance Federal spending with the need to reduce our deficit, it is important to bear in mind that these conservation programs are important not only to preserve the health and beauty of our natural environment but also because of the significant economic benefits they provide. A study commissioned by the National Fish and Wildlife Foundation found that outdoor recreation, nature conservation, and historic preservation provide 9.4 million jobs and account for over $1 trillion in the total economic activity.

In Maryland alone the National Fish and Wildlife Foundation has funded more than 400 projects since 2000, including such important conservation and restoration projects as manure-to-energy research at the University of Maryland, watershed restoration in the Wicomico River, and oyster restoration initiatives to restore key species of the Chesapeake Bay.

The Delaware River Basin includes the Delaware River Watershed in New York, Pennsylvania, New Jersey, and Delaware and the Delaware Bay. The basin is home to more than 8 million people, and 16 million depend on it as an economic engine, as a place for recreation, a source of clean drinking water, and a vital habitat for fish and wildlife.

The North American Wetlands Conservation Act's matching grant program, which funds projects to conserve wetlands that benefit migratory birds and other wildlife, creates nearly 7,500 new jobs annually in the United States, and on average it generates over $200 million in workers' earnings each year.

I think everybody is getting to see the theme. These are programs that protect the beauty, and what makes America so special is unique to our species diversification, but also plays a critical part in our economy.

In addition to conserving wildlife for recreation purposes, wildlife also plays a critical role in maintaining a healthy ecosystem. They pollinate plants, prey on insects like mosquitoes, moths, and beetles, thereby reducing the need for pesticides. Yet emerging diseases such as colony collapse disorder in bees and white-nose syndrome in bats threaten entire species of wildlife. S. 357, the Wildlife Disease Emergency Act, would focus resources and attention on

diseases like white-nose syndrome by creating a Federal plan for responding to wildlife disease emergencies.

Three of the bills we will consider today address the ability of marksmen, hunters, and other outdoorsmen to enjoy our national wild space. S. 1249, the Target Practice and Marksmanship Training Support Act, would give States more flexibility to using existing funds to create and maintain safe shooting ranges in national parks.

S. 2071, the Permanent Electronic Duck Stamp Act, would authorize the U.S. Fish and Wildlife to sell Federal duck stamps on line. Since 1934 sportsmen have been required to purchase a Federal duck stamp to hunt migratory waterfowl. The program generates approximately $25 million per year, which is deposited into the Migratory Bird Conservation Fund to preserve habitat and ensure future hunting opportunities.

S. 2156, the Migratory Bird Habitat Enhancement and Investment Act, this bill also affects the Duck Stamp Program by permitting the Secretary of Interior, in consultation with the Migratory Bird Conservation Commission, to set prices for duck stamps. The Duck Stamp Program is an important resource for conservation activities nationwide, and especially in my home State of Maryland.

Just this past March, the Department of Interior announced that the Migratory Bird Conservation Commission had approved over $500,000 in funding to conserve 112 acres of habitat for waterfowl and other wildlife in Maryland's Blackwater National Wildlife Refuge to be funded with duck stamp proceeds. I am very proud of Blackwater Refuge. Its unique habitat and ecology make it one of Maryland's most important natural resources. The Duck Stamp Program is a key resource for maintaining Blackwater and other environmental programs.

And finally, S. 810, the Great Apes Protection and Cost Savings Act, would retire approximately 500 federally owned chimpanzees currently in laboratories to permanent sanctuary. At Congress' request, the National Institutes of Health commissioned a study of the chimpanzees used in biomedical research and determined that using chimpanzees was unnecessary in most instances. S. 810 is an attempt to address this ongoing issue.

So, we have very important bills that are before us. I am pleased, again, with the leadership that the Members of the Senate have shown on these important environmental and economic issues.

With that, let me turn to the ranking Republican of the Committee, Senator Inhofe.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Thank you, Mr. Chairman. And thank you for having this.

I want to especially welcome Dan Ashe to this hearing. Back during the confirmation process we had a chance to visit about what his goals were and what our goals were, and he agreed to come to Oklahoma to listen to some of the problems that our ag community primarily would have with the listing of the lesser prairie-chicken. And we were able to really—actually, he had two meetings, one in

Woodward, way out in the Panhandle, and one in more of the central part of the State.

Anyway, the listing would significantly harm agriculture, construction of highway infrastructure, and energy development, including numerous wind development projects in the Woodward area, which he saw when he was out there. I fly my plane out there quite often, and I take people who have not been up. In any one place you can see about 300 of these windmills going around. So, they have a dog in this fight, too.

Of course, the listing is not the only option, and it certainly is not the best. While in Oklahoma, Director Ashe also had a chance to hear about how Oklahomans have invested millions of dollars and a great deal of time and significant effort and which are increasing the numbers of the lesser prairie-chickens without harming our economy.

I continue to call for the Fish and Wildlife Service to allow these voluntary efforts to achieve results before going through with the listing decision. Recently, there has been talk of a possibility of a 6-month delay which would be most welcome as it would give Oklahomans a chance to continue their important work.

So, let me just say thank you, Director Ashe, for your help out in Oklahoma.

Today's hearing is a great opportunity to put the spotlight on voluntary efforts as time and time again they prove to be the best methods of achieving land and species conservation goals without destroying jobs and hurting the economy. One such example can be found in a bipartisan bill I sponsored with my good friends Senators Boxer and Vitter, the North American Wetlands Conservation Extension Act.

This program has such a good track record for conservation precisely because it is a volunteer effort. It incentivizes non-Government funds for wetland and wildlife habitat conservation. On each, each Federal dollar is matched by $3.20 from non-Federal contributions. In my State of Oklahoma, it currently has 12 projects either completed or underway. These projects have conserved some 26,869 acres of wildlife habitat and leveraged $11.3 million in partner contributions from the $4.9 million in the funding.

The Hackberry Flat Project in Tillman County has led to the restoration of wetland habitat, and the area is now open for hunting waterfowl, dove, quail, rabbit, and sandhill cranes. When you compare the successes with the Federal mandates which most often do not achieve the conservation goals but give States unnecessary economic pain it is clear that the voluntary programs should be at the center of all conservation efforts.

In addition to the NAWCA, we will be discussing several conservation bills today, including the National Fish and Wildlife Foundation Reauthorization Act, which is another promising voluntary effort. The National Fish and Wildlife Foundation is doing important work protecting the lesser prairie-chicken in order to help prevent this listing under the Endangered Species Act. Most importantly, the bill reduces the authorization level by $5 million while still giving the Foundation the ability to leverage funds for conservation projects.

The only other bill I have concerns about is S. 810, the Great Apes Protection Act. I look forward to hearing from Dr. Anderson from the National Institute of Health, his thoughts on this legislation.

I would like to thank all the witnesses for being here today, especially Greg Schildwachter, former Staff Director of this Subcommittee, who now works at Watershed Results LLC. With his background, he will be able to provide valuable insight on the effectiveness of these bills. I look forward to having an important dialogue about how best to achieve the conservation goals without causing more pain.

And by the way, I always have trouble with his last name because, when he was on the Committee, we just called him Greg.

[Laughter.]

Senator INHOFE. Anyway, we have the partnership programs, and others have been so successful, and I say to Director Ashe, as Oklahoma as kind of a good testing ground for these programs, and I think you probably came back with that same impression.

Thank you, Mr. Chairman.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE,
U.S. SENATOR FROM THE STATE OF OKLAHOMA

I would like to thank Senator Cardin and Senator Sessions for holding this hearing on a number of important wildlife conservation bills.

I would especially like to welcome Dan Ashe, Director of the U.S. Fish and Wildlife Service. Director Ashe traveled to my home State late last year to hear from Oklahomans about how devastating a listing of the lesser prairie-chicken would be for Oklahoma's economy: this listing would significantly harm agriculture, the construction of highway infrastructure, and energy development, including numerous wind development projects in the Woodward area. But of course a listing isn't the only option, and it certainly isn't the best. While in Oklahoma Director Ashe also had the chance to hear about how Oklahomans have invested millions of dollars and a great deal of time in significant voluntary efforts which are increasing the number of lesser prairie-chickens without harming our economy. I continue to call for the Fish and Wildlife Service to allow these voluntary efforts to achieve results before going through with a listing decision. Recently there has been talk of a possibility of a 6-month delay, which would be most welcome as it would give Oklahomans more time to continue this important work.

Today's hearing is a great opportunity to put the spotlight on voluntary efforts, as time and time again they prove to be the best methods of achieving land and species conservation goals without destroying jobs and hurting our economy. One such example can be found in a bipartisan bill I am sponsoring with my good friends Senators Boxer and Vitter: the North American Wetlands Conservation Extension Act of 2012 (S. 2282).

This program has such a good track record for conservation precisely because it is a voluntary effort; it incentivizes non-Federal funds for wetland wildlife habitat conservation. On average, each Federal dollar is match by $3.20 of non-Federal contributions.

In my State of Oklahoma NAWCA currently has 12 projects either completed or underway. These projects have conserved 26,869 acres of wildlife habitat and leveraged $11.3 million in partner contributions from $4.9 million in NAWCA funding. The Hackberry Flat project in Tillman County has led to the restoration of wetland habitat, and the area is now open for hunting waterfowl, dove, quail, rabbit, and sandhill cranes. When you compare the success of NAWCA with Federal mandates which most often do not achieve conservation goals but give States unnecessary economic pain, it's clear that the voluntary programs should be at the center of all conservation efforts.

In addition to NAWCA, we will be discussing several conservation bills today, including the National Fish and Wildlife Foundation Reauthorization Act (S. 1494), which is another promising voluntary effort. The National Fish and Wildlife Foundation is doing important work protecting the lesser prairie-chicken in order to help

prevent its listing under the Endangered Species Act. Most importantly this bill reduces the authorization level by $5 million while still giving the foundation the ability to leverage funds for conservation projects.

I also support Senator Wicker's bill, S. 2071, the Permanent Electronic Duck Stamp Act of 2012, which, as stated in the title, allows the purchase of electronic duck stamps for waterfowl hunters across all 50 States. Migratory waterfowl hunters are required to purchase a Federal Duck Stamp from the Fish and Wildlife Service, and the stamp grants them access to Federal Wildlife Refuges without any additional fees. This bill follows a successful pilot program by eight States that allowed the purchase of the Federal Duck Stamp online. Additionally, this bill comes at no cost to taxpayers.

One bill, though, that I cannot support in its current form is S. 810, the Great Apes Protection Act. While we certainly want to treat animals as humanely as possible, this bill goes too far with an outright ban on chimpanzee research. Recently, the National Academies' Institute of Medicine (IOM) released a report regarding the use of chimpanzees in biomedical and behavioral research. The IOM report states, "The committee's report does not endorse an outright ban on chimpanzee research" and warns "how disruptive an immediate outright ban would be, affecting animal care and potentially causing unacceptable losses to the public's health." It continues to state that "chimpanzees may prove uniquely important to unraveling the mystery of diseases that are unknown today."

Chimpanzee research has led to the development of vaccines for hepatitis A and B and has helped gain important insight into diseases such as hepatitis C, malaria, HIV, and cancer. An outright ban would be very shortsighted and may endanger public health.

I would like to thank all the witnesses for being here today, especially Greg Schildwachter, a former staff director of this Subcommittee who now works at Watershed Results, LLC. With his background he will be able to provide valuable insight on the effectiveness of these bills.

I look forward to having an important dialogue about how best to achieve conservation goals without causing more pain in tough economic times.

Thank you.

Senator CARDIN. Again, Senator Inhofe, thank you for your leadership on so many of these issues.

Senator Lautenberg.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thanks, Mr. Chairman, for holding this hearing on legislation to protect wildlife, including legislation that I introduced to address the threats to bats and other wildlife.

Since 2006 more than 5 million hibernating bats have died from a disease called white-nose syndrome. And it is happening in 19 States across the country, particularly in New Jersey. We have a sanctuary for bats called the Hibernia Mine. I went down into that mine in 1997 and visited with a bunch of bats. To be precise, 30,000 of them were there, and I was very comfortable with them, I must tell you.

The bat population, however, having remained constant for a decade, suddenly in 2009 it was discovered that the number of bats went from 30,000 down to just 700. Bat mortality rates in some caves are approaching 100 percent. You cannot make a mistake. The loss of these bats poses a major threat to entire ecosystems, with the potential to cause serious environmental and economic problems.

Bats are one of nature's best exterminators, helping to protect the public's health and our crops. They prey almost exclusively on mosquitoes and other insects which spread disease, and moths and beetles which damage crops. A single bat can eat half of its body

weight in insects in a single night, and an entire colony will consume hundreds of millions of insects.

In the 6 years since the white-nose syndrome was first discovered in New York State, we have made some progress in the fight against the disease. We had a hearing in this Subcommittee, last Congress, and have secured more than $5 million to address white-nose syndrome. The challenges that make white-nose syndrome so difficult to address are the same as those that affect many developing wildlife diseases. And as a result, Federal agencies have been able to determine the origin and cause of white-nose syndrome.

Last month, Senator Leahy and I sent a letter to the Appropriations Committee, signed by 11 other Senators, asking for additional funding for white-nose syndrome. But we must do more, which is why I introduced the Wildlife Disease Emergency Act.

So, what we have to do is, we have got to really put our resources into this fight. Today, we are forced to scramble to develop a basic response to a disease, only to find out that the outbreak has surpassed the scale of the response. In the years since the white-nose outbreak began, the Fish and Wildlife Service has done great work to coordinate response across several agencies and with State governments.

My bill would help Federal and State agencies to be better prepared to respond to future outbreaks of wildlife diseases. It would also authorize more resources to address wildlife disease emergencies, including the ongoing response to white-nose syndrome.

The bill still is endorsed by 17 wildlife groups, including Bat Conservation International, the National Resource Defense Council, the Defenders of Wildlife, and many other distinguished agencies. In a letter of support, they note overarching coordination is necessary to promote efficiency and prevent redundancy and that this bill will provide that coordination.

And I ask unanimous consent that their letter of support be included in the record.

Senator CARDIN. Without objection.

Senator LAUTENBERG. Our mission is clear. We have got to do more to stop this deadly outbreak and be better prepared to stop the next wildlife disease emergency.

I thank the witnesses for being here. I look forward to hearing from them today on all of these bills.

I thank you, Mr. Chairman.

[The referenced letter follows:]

American Bird Conservancy • Animal Welfare Institute • Association of Zoos and Aquariums • Bat Conservation International • Center for Biological Diversity • Defenders of Wildlife • EcoHealth Alliance • Endangered Species Coalition • Houston Zoo • International Fund for Animal Welfare • National Speleological Society • Natural Resources Defense Council • The Nature Conservancy, Tennessee Chapter • Pollinator Partnership • Western Nebraska Resources Council • The Wildlife Society • The Xerces Society for Invertebrate Conservation

April 24, 2012

Dear Chairman Cardin and Ranking Member Sessions,

Thank you for holding a hearing on legislation that is so important to wildlife. As non-governmental organizations engaged in conserving wildlife, including preventing and controlling wildlife disease, we are writing to express our support for the Wildlife Disease Emergency Act, S.357.

New and emerging diseases pose a critical and growing threat to the health of wildlife. Since 1970, more than 40 previously undocumented diseases have been identified around the world. The global wildlife and pet trade, international travel, introduction of non-native species, and changes in human land-use have all contributed to wildlife coming into contact with pathogens to which they are unaccustomed and lack resistance. As globalization accelerates, this trend will only continue. Industrial byproducts such as mercury and lead, agricultural products like fertilizers and pesticides, and medicinal and other products in human sewage and garbage can also cause disease, often by suppressing immune response. Climate change's alterations to ecosystems will further exacerbate disease outbreaks by creating conditions favorable to such vectors as ticks and mosquitoes.

Wildlife disease affects human well-being. Bats and birds consume vast numbers of insects that would otherwise attack agricultural crops, for example, and bees pollinate crops and other plants. Losing these animals to White-nose Syndrome, West Nile Virus, and diseases impacting native pollinators affects not only wildlife, but also farmers and consumers. Other wildlife diseases kill animals we rely on for food. Prior to effective control strategies in the United States, avian influenza and Newcastle disease were transferred among wild birds and poultry, while viral hemorrhagic septicemia still affects both wild fish and aquaculture populations, with impacts for fisheries. Moreover, while not all emerging wildlife diseases cause illness in humans today, a disease may mutate from animal forms to human forms in the future, especially in the face of the environmental changes described above. We are keen to prevent the human and economic tolls associated with such disease transfer as we have witnessed with the emergence of human immunodeficiency virus (HIV) from non-human primates.

The gravity of emerging wildlife disease is compounded by institutions' difficulty addressing it. In many cases, little to no knowledge exists about an emerging disease, so researchers must start from scratch in order to gain scientific understanding. Wildlife managers are obligated to develop protocols to handle the disease on the ground. Groups must educate the public, and policymakers have to learn about the disease in order to enact appropriate measures to combat it. Overarching coordination is necessary to promote efficiency and prevent redundancy. Federal

funds are needed for any of this to occur. Too often, the wildlife disease community scrambles to develop a basic response for a disease, only to find the outbreak's magnitude has surpassed the scale of the response.

We support the Wildlife Disease Emergency Act because it would help remedy the major challenges inherent in responding to emerging wildlife diseases: lack of intellectual, logistical, and financial resources. The coordinated response team and interagency Wildlife Disease Committee envisioned by this legislation will facilitate scientific discoveries and inform decision-making in the early stages of an outbreak. Federal, State, and Tribal agencies and other stakeholders, including NGOs, which the Secretary of the Interior may mobilize will provide logistical assistance needed to monitor and manage a disease. The Wildlife Disease Emergency Fund and Grant Program will speed the delivery of funds to carry out the aforementioned work. These funds will also be money saved, since controlling a disease early is cheaper than dealing with a full-blown outbreak. Finally, authorizing the Secretary of the Interior to declare a wildlife disease emergency will help legitimize a disease in the eyes of the public and of private funders.

We thank Senator Lautenberg for introducing this legislation. We also thank Chairman Cardin and Senators Bingaman, Leahy, Menendez, and Sanders for co-sponsoring it. Because it addresses serious gaps in wildlife disease emergency response, we endorse it and urge its approval by the Senate.

Sincerely,

Laurie Davies Adams
Executive Director
Pollinator Partnership
San Francisco, CA

Mary Beth Beetham
Director of Legislative Affairs
Defenders of Wildlife
Washington, DC

Scott Hoffman Black
Executive Director
The Xerces Society for Invertebrate Conservation
Portland, OR

Sylvia Fallon
Senior Scientist
Natural Resources Defense Council
Washington, DC

Nina Fascione
Executive Director
Bat Conservation International
Austin, TX

Jeffrey Flocken
Director, Washington, DC Office
International Fund for Animal Welfare
Washington, DC

Gina Hancock
State Director
The Nature Conservancy, Tennessee Chapter
Nashville, TN

Leda Huta
Executive Director
Endangered Species Coalition
Washington, DC

William B. Karesh
Executive Vice President for Health and Policy
EcoHealth Alliance
New York, NY

Paul R. Krausman
President
The Wildlife Society
Bethesda, MD

Cathy Liss
President
Animal Welfare Institute
Washington, DC

Mollie Matteson
Conservation Advocate
Center for Biological Diversity
Richmond, VT

Buffalo Bruce McIntosh
Staff Ecologist
Western Nebraska Resources Council
Chadron, NE

Steve Olson
Vice President, Federal Relations
Association of Zoos & Aquariums
Silver Spring, MD

Peter Riger
Vice-President of Conservation
Houston Zoo
Houston, TX

Darin Schroeder
Vice President for Conservation Advocacy
American Bird Conservancy
Washington, DC

William Shrewsbury
President
National Speleological Society
Huntsville, AL

Senator CARDIN. Thank you.
Senator Udall.

OPENING STATEMENT OF HON. TOM UDALL, U.S. SENATOR FROM THE STATE OF NEW MEXICO

Senator TOM UDALL. Thank you, Senator Cardin. I will try to be brief since our colleagues are here. But I want to thank you for holding this hearing on all of these very important bills.

This Committee has the important task of ensuring that wildlife throughout the Nation is appropriately managed. The bills before the Subcommittee today do a great deal to help ensure species are protected, watersheds are vibrant, and animals receive humane treatment.

About 1 year ago I invited Senators Bingaman and Harkin to join me and ask the National Academy of Sciences to complete a study on the necessity for chimpanzee use in biomedical and behavioral research. This study was meant to lay out the scientific basis for the need for chimpanzees in research and to inform future policy decisions relating to invasive research on chimpanzees.

I commend the National Academy of Sciences for taking on the task, which was assigned to and completed by the Institute of Medicine. The Institute was diligent in bringing in experts from diverse fields and allowing for public involvement. The resulting report is a non-biased resource for policymakers.

I would also like to commend the National Institutes of Health for their quick and deliberate response to the report and look forward to hearing what progress the National Institutes of Health has made toward adopting the recommendations of the IOM.

I also look forward to hearing from the other panelists today.

The most important thing that they concluded was that, for the most part, chimpanzees are not needed in most research, which was a bit of surprise, I think, to everyone, and it looks like we are going to—Chairman Cardin, you mentioned this in your opening statement—move forward with those recommendations expeditiously.

Jane Goodall just put together testimony, Chairman Cardin, on this particular issue, and I have a copy of that, and I would ask that it be put in the record. And I would also ask that the remainder of my opening statement be deferred and give the courtesy to our colleagues that are here to inform us on the pieces of legislation they are working on.

And with that, I yield back.

Senator CARDIN. Without objection, your full statement will be included in the record, as well as the additional comments from the other person mentioned.

[The referenced testimony follows. The prepared statement of Senator Tom Udall was not received at time of print.]

Statement of

Dr. Jane Goodall, DBE
Founder, the Jane Goodall Institute &
UN Messenger of Peace

For a Hearing of the
U.S. Senate Committee on Environment and Public Works
Subcommittee on Water and Wildlife

April 24, 2012

406 Dirksen Office Building, 10:15 a.m.

Dear Chairman Cardin and Members of the Subcommittee:

Thank you for the opportunity to submit this statement in support of S.810, the Great Ape Protection and Cost Savings Act of 2011. I commend Senator Cardin for including this measure in the hearing today.

I would like to begin by expressing my deep appreciation for the hard work of the Institute of Medicine (IOM) committee members who last year reviewed the status of chimpanzee biomedical and behavioral research as it stands today. I was particularly impressed by their expert analysis of the exciting alternatives to the chimpanzee model that have been developed in the past five to 10 years and that are likely to be developed in the near future—many of which make no use of animals at all. So many new research tools exist today that I could not have dreamed of when I began my research more than 50 years ago in what is now Gombe National Park in Tanzania. Some of these new tools can even be employed with chimpanzees in the wild. Today, researchers at Gombe perform a wide range of biomedical and behavioral studies, all without use of invasive methods of any kind.

I would also like to say that we have a great deal of respect for scientists at the National Institutes of Health (NIH) and elsewhere who are working so hard to find cures for a broad range of human diseases. The majority of the researchers with whom I have met feel that it is wrong to use chimpanzees in invasive research due to the scientific limitations of using this animal model and because of clear ethical concerns. I would not be surprised if there are many scientists working for the government or doing government-funded research who are quite relieved by the IOM report and the very wise decision of the NIH to adopt its recommendations.

It is critical that highly respected scientists at IOM and NIH have spoken on this issue. Without their thoughtful analysis, many legislators—and their constituents, for that matter—would not feel comfortable discussing this issue. They might have continued to hear only a one-sided point of view. But, because of these scientists' expert and candid assessment, we now know that most current use of chimpanzees for biomedical research is unnecessary. And the IOM and NIH scientists have come up with very stringent regulations that would have to be met before any

researcher would be allowed to use a chimpanzee model. For one thing, they would have to prove that there was NO OTHER method which would enable them to get the information.

The scientists have spoken. Now it is time for those who represent the general public to stand up and share their views. I hope that you will move this piece of legislation forward. Tweak it if you must, but do pass this bill. In so doing, you will not just improve the lives of captive chimpanzees, but you will also advance the ethical standing of mankind.

Thank you for allowing me to contribute to this hearing.

With kind wishes, I am respectfully

Jane Goodall, Ph.D., DBE
Founder, the Jane Goodall Institute &
UN Messenger of Peace

Senator CARDIN. We will now turn to our colleagues.

First, let me welcome Senator Mark Udall to our Committee. Senator Udall is the sponsor of S. 1249, the Target Practice and Marksmanship Training Support Act.

It is a pleasure to have you before our Committee.

OPENING STATEMENT OF HON. MARK UDALL, U.S. SENATOR FROM THE STATE OF COLORADO

Senator MARK UDALL. Thank you, Mr. Chairman, and in the spirit of my good cousin from New Mexico, I will also try to be brief.

I want to thank you and Ranking Member Sessions for your support. I am also grateful to Chairwoman Boxer and Ranking Member Inhofe for including my bipartisan legislation into today's hearing. I want to also acknowledge my good friend, Senator Lautenberg from New Jersey.

I have introduced the Target Practice and Marksmanship Training Support Act. It is designed to encourage the development of high quality shooting ranges which are open to the public by amending certain parts to the Pittman-Robertson Wildlife Restoration Act. That Act provides Federal support for certain wildlife restoration and hunter education programs.

My bill would give the States greater flexibility over the Federal law than they already receive from the PR, the Pittman-Robertson funds, which would free up more money to build shooting ranges. The funds from Pittman-Robertson come from an excise tax on the sale of shooting and archery equipment. This bill helps those paying into the system, which are primarily sportsmen, get a better return on their investment.

By focusing on flexibility with already allocated funds, the legislation will not cost taxpayers an additional dime. And in return, I believe it will be a tremendous boon for our sportsmen and our outdoor recreation communities which are not only an integral part of our national heritage but are a key component of our economy, especially in rural areas, which we all do represent.

For those reasons, the bill has broad bipartisan support. Here, Senator Risch teamed up with me to author the bill. It has broad support within the sportsmen's community, and I am grateful for the support that we have gotten from everybody from the National Shooting Sports Foundation to the National Rifle Association.

As you all know, often the best ideas for legislation come from the local communities, and I really had overwhelming support in Colorado from people who want to see the development of more high quality shooting ranges. So, I want to finish with some comments from two of my constituents.

Donald in Pagosa Springs, Colorado, which is down in the wonderful southwestern part of the State near my cousin's State of New Mexico. He wrote to me, I have been a hunter education instructor for over 30 years and helped teach over 5,000 students. Since we have no public shooting facilities in the Pagosa Springs area, it is always a challenge to find a safe and accessible location for the range portion of the class. We desperately need a range facility in our area to be able to continue teaching our kids and those who are new to hunting how to safely handle firearms.

From Gary in Aurora, Colorado, my father helped to found and build a recreational shooting facility in the late 1950s. I was literally brought up at the range. I spent every weekend working there. These ranges are not just a place to shoot. They are a close knit family full of diverse people. Our club has also taught my son the love of shooting and safety along with me. I cannot stress this enough as we are seeing more and more clubs closing down. We need more places to teach, enjoy, and relax with fellow shooters.

So again, Mr. Chairman, thank you for giving me an opportunity to present my bill to you, and I look forward to working with the Committee to advance this important legislation.

Senator CARDIN. Thank you, Senator Udall. I appreciate your leadership on this and so many other issues.

Senator Begich is the principal sponsor of S. 2156, the Migratory Bird Habitat Investment and Enhancement Act.

Senator Begich.

OPENING STATEMENT OF HON. MARK BEGICH, U.S. SENATOR FROM THE STATE OF ALASKA

Senator BEGICH. Thank you, Chairman Cardin, and also the other members that are here for holding this hearing today, including S. 2156, the Migratory Bird Habitat Investment and Enhancement Act.

Since it was created in 1934 the Federal Duck Stamp Program has been one of the most successful conservation tools in history. It has raised over $750 million and has preserved over 5 million acres of wetlands to protect waterfowl habitat. It has preserved lands which maintain our hunting heritage and boosted waterfowl population for enjoyment by all.

I introduced the bill to address two issues with the duck stamp. One is to adjust the price. The current price, $15, has not changed since 1991, and has lost over half its value due to inflation. Without a change, the Duck Stamp Program cannot continue to do the work it has been doing.

Rather than just hike it, I propose to allow the Secretary of Interior, in consultation with the Migratory Bird Conservation Commission, to adjust the price once every 5 years. I think you will hear from the duck hunters that even they support this since they benefit directly from the program.

My bill also allows the Secretary to grant limited waivers from the stamp fee. That is a response to subsistence shooters in my State who argue they have already done their part for wetlands conservation. Millions of acres of native lands have been set aside in refuges or in some other protected status. Such a waiver would have minimal impact on the Duck Stamp Program but will relieve subsistence users who still live off the land for most of their diet from the cost of this Federal program.

I welcome your consideration of this bill and would be happy to answer any questions you may have as you move forward on this piece of legislation.

Thank you, Mr. Chairman.

Senator CARDIN. Well, thank you, Senator Begich and Senator Udall. We thank both of you for your leadership on these important issues. And I do not see that there are any questions from mem-

bers of the Committee, so thank you very much. You are both excused.

We will now turn to our first panel. We are pleased to have Hon. Dan Ashe with us. He is the Director of the U.S. Fish and Wildlife Service, the Nation's principal Federal agency dedicated to the conservation of fish and wildlife and their habitats.

Director Ashe has a long and distinguished career in conservation. Prior to assuming the Director's position, he served within the Fish and Wildlife Service as Deputy Director for Policy, as a science advisor, and as Chief of the National Wildlife Refuge System. I also am pleased to note that he is a Maryland constituent.

We are also pleased to have Dr. James Anderson. Dr. Anderson is the Director of the Division of Program, Coordination, Planning and Strategic Initiatives of the National Institutes of Health. Dr. Anderson has expertise in both clinical medicine and academic research and has held key academic positions with the University of North Carolina, Chapel Hill, and the Yale School of Medicine.

Welcome, both of you, to our Committee. We thank you for your service to our country, and we thank you for being here today.

We will start off with Mr. Ashe.

STATEMENT OF HON. DANIEL M. ASHE, DIRECTOR, U.S. FISH AND WILDLIFE SERVICE

Mr. ASHE. Thank you, Senator Cardin, Committee members. It is great to be here.

Senator Inhofe, I would start off by again saying thank you for the invitation to come to Oklahoma. It was a wonderful opportunity. It was tragic just about 2 weeks ago when I saw that a tornado had occurred in Woodward, and it made me feel for those great people up there. So, my heart goes out to everyone there, Senator.

I would like to begin by saying the Committee is considering a great breadth of legislation today, things that really touch on the breath of challenges that we are facing in the wildlife conservation world today. As we think about those challenges, we have to think about the root of those challenges, and it really is us.

We see, of course, continued expansion of population at the world scale but also at the United States scale. And it is not just an expansion in the total number of people. It is the expansion of affluence in both the United States and in the world as a whole.

We all want a better place for our children and grandchildren. We want a strong economy; we want an expanding economy. But I think we have to realize that what that means for the land and the water resources of our Nation and the world is that we will be asking more of the land and water resources to produce more food, more fuel, more fiber, and more water for our human needs. And that means, of course, less for the rest of what we could collectively call biological diversity.

So, as you see these pieces of legislation before you today you are really dealing with the root of the issues and challenges that we face, the continued fragmentation and destruction of habitat.

I will point you to the prairies, the American prairies where, which are really the—we call it the duck factory as we think about waterfowl in the United States. We are seeing a perfect storm in

the American prairie today driven by $8 a bushel corn, but also new genetically modified crops that allow growing of crops in wetter and drier areas, new draining and tiling techniques that allow the removal of water from many of these systems. And so, we are seeing the conversion of wetland and grassland habitat in the prairies at rates that are unprecedented.

So as you are considering today the reauthorization of the North American Wetlands Conservation Act, and the authorization for the Secretary to increase the price of the duck stamp, these will be vital tools to us as we seek to conserve America's great wetlands, expand our partnership with Canada and Mexico, and continue to great heritage of waterfowl hunting and the great tradition that it supports.

As we see habitats diminishing, it also means that our wildlife populations will be more susceptible to stressors like wildlife disease. Senator Lautenberg has been a leader in raising the profile of white-nose syndrome. We are also dealing with the challenges of chytrid fungus in amphibians, which is driving worldwide decline amphibians.

Of course, again, the root of many of these problems is trade. We see trade globally escalating. And many of our laws like the Lacey Act, which is a key wildlife enforcement law, was written in 1900 when trade moved by steam locomotive for the most part. And now we have, of course, global trade where we can move products and commodities across the globe on a 24-hour scale.

So, as we think about the challenge of conservation, many times in the past we have driven our philosophy of conservation from a public land base, and public lands in the United States are about 30 percent of the land base. I mean, 70 percent is in private ownership.

So, the legislation that is before you to reauthorize the National Fish and Wildlife Foundation, of course, that public-private partnership, is essential to us as we think about conservation in the future, and organizations like the National Fish and Wildlife Foundation that provide the opportunity to bring and leverage public and private partnerships are essential as we think about conservation in the 21st century, and of course expanding the opportunity for outdoor recreation as represented in Senator Udall's legislation and Senator Begich's legislation.

I think that that opportunity to use an instrument like the Pittman-Robertson Program and the Wildlife and Sport Fish Restoration Program to expand opportunities for shooting on public land is a great opportunity for the future.

So, expanding challenges in an era of diminishing resources means that we need exceptional leadership. And I want to thank you, Mr. Chairman, and all of the members of the Committee, for your great leadership as represented by the legislation that you are hearing today.

[The prepared statement of Mr. Ashe follows:]

**TESTIMONY OF DAN ASHE, DIRECTOR,
U.S. FISH AND WILDLIFE SERVICE, U.S. DEPARTMENT OF THE INTERIOR,
BEFORE THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON WATER AND WILDLIFE, REGARDING
S. 357, THE WILDLIFE DISEASE EMERGENCY ACT OF 2011;
S. 1249, THE TARGET PRACTICE AND MARKSMANSHIP TRAINING SUPPORT ACT;
S. 2071, THE PERMANENT ELECTRONIC DUCK STAMP ACT OF 2012;
S. 2156, THE MIGRATORY BIRD HABITAT INVESTMENT AND ENHANCEMENT ACT OF 2011; S. 2282, THE NORTH AMERICAN WETLANDS CONSERVATION EXTENSION ACT; S. 1266, THE DELAWARE RIVER BASIN CONSERVATION ACT OF 2011; AND S. 1494, THE NATIONAL FISH AND WILDLIFE FOUNDATION REAUTHORIZATION ACT OF 2011**

April 24, 2012

Introduction

Chairman Cardin, Ranking Member Sessions, and Members of the Subcommittee, I am Dan Ashe Director of the U.S. Fish and Wildlife Service (Service) within the Department of the Interior (Department). Thank you for the opportunity to testify on bills that address multiple responsibilities of the Service for the conservation of our nation's fish and wildlife for the benefit of our citizens, including conserving migratory birds and their habitats, administering critical funding for state conservation and sportsman programs, and addressing a matter of grave and growing significance to wildlife conservation, that of wildlife disease.

The Service is the nation's premier conservation agency, dedicated to ensuring that Americans today and in future generations can enjoy the nation's abundance of wildlife, wander lands and winding waters. Whether they hunt game, cast for fish, climb trees, paddle canoes, snap photographs, ski downhill, or bike or hike up hills, the bills you are considering today will enrich their opportunities across the United States and its territories. The intrinsic value of these species and the sustainability of their populations is demonstrated through the millions of annual visitors to our National Wildlife Refuges and other federal lands; through the millions of people who support a wide array of wildlife conservation organizations and causes; and through the billions of dollars in economic impact of hunters, fishers, photographers, and watchers as they purchase equipment and trip-related services to pursue the wildlife they enjoy. The Department appreciates the support and leadership of the Committee across a myriad of conservation issues as well as this opportunity to talk about a range of these issues.

The Threat and Challenge of Wildlife Disease

Although disease is present as a natural influence on living organisms, shaping population composition of species and evolution, human alteration of natural landscapes has resulted in an alarming increase in both the incidence and severity of new and emerging diseases affecting native

fish and wildlife species in the past 40 years. These diseases can significantly impact matters of great importance to Americans in the broad categories of ecological, economic, and human health. The sources and transmission of many emerging fish and wildlife diseases are not well understood, but the impacts on affected fish and wildlife populations can be devastating. For example, white-nose syndrome in bats and *chytrid* fungus in amphibians have caused unprecedented declines in affected wildlife populations. Since its discovery in a New York cave in 2006, white-nose syndrome has killed an estimated 5 million bats, decimating populations of hibernating bats in the northeast, southeast, and Midwest States. The *chytrid* fungus has contributed to massive losses and extinctions of amphibians, including frogs and toads, in many nations around the world. As primary insectivores, both groups of species play an important ecological role in the balance of insect populations, some of which can have significant impacts on United States agriculture, as well as human health.

Diseases that can be transmitted from animals to humans, like West Nile virus or rabies, are called "zoonotic". The Centers for Disease Control reports that more than 75 percent of diseases currently classified as "new or emerging" are considered zoonotic. Rapid response to disease outbreaks can help contain them, however this requires quick access to adequate funding, coordination with partners at both the policy and ground level, and the ability to quickly ramp up infrastructure and activities. Limited and uncertain availability of resources coupled with the complexity of governance over both animal and human health – split among federal, state, and local agencies – make such responses, even to zoonotic diseases, very challenging.

Sources of disease in wild animals may include disease transmitted by domestic animals to wildlife, the intentional importation of disease organisms or vectors, accidental introduction through ballast water or on an animal that has stowed away in cargo, or it can arise through the evolution of a once-benign organism into an invasive and virulent new disease threat to humans, livestock, or other fish and wildlife species. Infectious disease organisms can include bacteria, viruses, prions, fungi, and parasites with a wide range of life cycles. Major health threats to fish and wildlife populations also arise from noninfectious diseases associated with natural toxicants and anthropogenically-derived environmental contaminants, such as pesticides, lead, and endocrine disrupting chemicals. Disease may be caused or exacerbated by declining environmental conditions, caused by human activities on the landscape, which result in loss of food, water, or structural elements that provide shelter or territory for species that have evolved to live in a particular niche. The impacts of new and more aggressive disease organisms present tremendous challenges for conservation, both through their direct impact on the productivity of animal populations and through the loss of the direct and indirect roles of these animals in their ecosystems.

As illustrated by West Nile virus, public policy is generally reactive to emerging diseases – not proactive – and maintaining focus of public resources on managing any disease in the long term, let alone taking proactive steps, can be challenging. Changes in public priorities often shift limited resources away to other problems, and animal or human health issues can quickly overwhelm available funding. However, in addition to significant ecological impacts, diseases arising in or fostered through wildlife populations can threaten humans, livestock, as well as aquatic and terrestrial species of significant ecologic and economic importance. Our ability to prevent or

respond to it requires a commitment of readily available resources and an ability to accelerate the necessary infrastructure and activities needed to effectively protect these public trust priorities.

With ever-increasing globalization and significant ecological, economic, and human health interests at stake, ensuring effective fish and wildlife disease detection, response, and management is profoundly challenging.

S. 357, the Wildlife Disease Emergency Act

The Department supports the intent of this legislation to address wildlife disease, and with further work and amendments to reflect our comments below, we would strongly support its enactment. This proposal would vest in the Secretary of the Interior the authority to identify "Wildlife Disease Emergencies" and to dedicate resources within a segregated account of funds to address them, including through the establishment of rapid response teams. It proposes to allow the Secretary to "establish a Wildlife Disease Committee to assist in increasing the level of preparedness of the United States to emerging wildlife diseases."

Currently, the Service employs a small number of veterinarians and other animal health specialists who specialize in avian and fish health or who have wildlife health expertise. The National Park Service (NPS) also employs a small number of veterinarians who work with NPS public health officials, and both agencies contribute to the Department's One Health Group, which facilitates coordination of actions across the Bureaus to monitor, identify, and respond to emerging diseases issues. These professionals work with the U.S. Department of Agriculture (USDA), the Centers for Disease Control, and other federal and state agencies on a wide range of fish and wildlife health issues. The Service offers technical assistance and works cooperatively with other agencies, like USDA, that have authority to screen and stop shipments of animals or plants suspected of carrying disease that may affect agricultural interests or human health.

Both the Service and the NPS work closely with the U.S. Geological Survey's National Wildlife Health Center, which employs a broad range of veterinary expertise and specialized facilities to provide technical assistance to state, tribal, federal, and other wildlife agencies necessary to respond to and manage diseases in order to prevent wildlife losses. The National Wildlife Health Center also conducts diagnostic investigations and research to identify emerging diseases and to understand the impact of diseases on wildlife populations, as well as to devise methods through which we can more effectively manage these threats.

The Service has in place tools and resources to address disease affecting particular groups of species, such as our nine National Fish Health Centers, which are located primarily in the Northwest, but are also in the north, south, and central regions. These Centers, which work collaboratively with the USGS Western Fisheries Research Center, play a critical role in identifying and managing fish disease in hatcheries, as well as aquatic ecosystems through the National Wild Fish Health Survey. Similarly, the NPS has a Wildlife Health Team that provides technical assistance to National Park units in preventing and managing disease. Ensuring capacity and adequate resources to address new and emerging diseases is challenging. New and emerging

diseases quickly overwhelm the systems we have been able to put in place to address existing diseases, which continue to pose threats to the sustainability of wildlife populations. Yet, addressing existing diseases is not part of S. 357, as we interpret its language.

Prevention of new diseases becomes increasingly challenging as the live animal trade grows. In November 2010, the Government Accountability Office noted the challenges that the Service and other federal agencies have in reducing the risk of disease through live animal imports. The potential for preventing disease from entering the United States through this route is not included in S. 357.

The Service has authority to list invasive species as "injurious wildlife" under the Lacey Act (Title 18), which prohibits listed species from being imported into the United States or transported across state lines. Species are almost always listed after they have already become established and are already inflicting significant ecological and economic damage. Even more challenging to the prevention of such invasions is that the increase in the number of newly listed species does not correlate with increases to biological and law enforcement support to address the problem. The problem this poses, with regard to disease, in particular, is illustrated by a recent petition to the Service to list all amphibians under the Lacey Act "injurious species" provisions. The petition is based on the threat of the *chytrid* fungus to U.S. wild amphibian populations, because it has been documented as causing massive losses of amphibians worldwide. Bullfrogs grown on farms overseas for human consumption have been found to carry the *chytrid* fungus, and if the fungus reaches wild amphibian populations through this international market or through any importation of infected amphibians, it could decimate populations of these animals in the United States. However, listing all species of amphibians as "injurious" would quickly overwhelm current law enforcement capacity.

The Service is working to improve both our implementation of the Lacey Act and our capacity to address fish and wildlife diseases. Although not focused on disease specifically, we have conducted an internal analysis of the Lacey Act and its implementation, through which we have developed draft recommendations. These are currently undergoing review. We are also working toward a more centralized, coordinated wildlife health network within the agency, and in the process we are considering existing, effective governance models, such as the core national capability that the National Park Service has established in its Biological Resource Management Division.

This legislation is a good beginning for what the Department perceives to be a growing need to develop a governance framework that can focus resources and comprehensive, coordinated efforts among all federal agencies with responsibilities related to human and animal disease to both prevent the establishment of new disease and respond to outbreaks of emerging diseases. For a fully functioning framework, however, there is a need for certain, critical components that are missing from the bill. Whether they are addressed in this legislation or in subsequent legislative proposals, the following policy items should be considered: 1) parameters on the establishment of cooperative goals toward which government action and public resources can be prioritized, such as human health, agricultural interests, wild species of economic importance, and ecosystem health; 2) a framework for multiple agencies to cooperate on the inspection and screening of imported animals;

3) a framework for multiple agencies to respond to disease outbreaks, and 4) a stable source of funding that enables rapid response to emerging diseases.

The Department supports the intent of this legislation. We are glad to work with the Committee toward provisions that can support and strengthen the existing capacity of Department Bureaus and cooperation among federal agencies to address wildlife diseases, to specifically address the prevention of disease through the inspection of animal imports, and the provision of adequate resources and infrastructure to support both prevention and response.

S. 1249, the Target Practice and Marksmanship Training Support Act

Shooting, whether with gun or bow, is an American tradition. Creating opportunities for young Americans to experience this tradition, and pursue the goal of "marksmanship", also provides opportunity for them to learn about responsibility, about dedication, about accomplishment. The Department supports this legislation, because it will help create such opportunities, and we would like to work with the Committee to consider some technical corrections.

The Pittman-Robertson Wildlife Restoration Act (16 U.S.C. 669-669i) authorizes the Secretary of the Interior to cooperate with the States, through their respective State fish and game departments, in wildlife-restoration projects. The Act also provides for grants for a variety of uses including reintroduction of declining wildlife species, wildlife population surveys, species research, hunter education, acquisition of wildlife habitat, and public target ranges. Currently, Pittman-Robertson funds can only be used to pay 75 percent of the cost of building or operating a public target range. S. 1249, the Target Practice and Marksmanship Support Act, would amend the Pittman-Robertson Wildlife Restoration Act to change the funding requirements to allow up to 90 percent of target range construction and maintenance to be paid for with Pittman-Robertson funds, thus reducing the match burden on state and local governments.

In addition, S. 1249 would amend an existing requirement that Pittman-Robertson funding used for acquiring or constructing public target ranges be obligated within two years by allowing the funds to accrue over five years. This extension would allow individual projects to be funded over multiple budget cycles and significantly enhance the ability of states to acquire and build target shooting ranges.

S. 2071, the Permanent Electronic Duck Stamp Act of 2011

The Department supports the intent of S. 2071, which would authorize the Secretary of the Interior to continue to administer a program which enables hunters to purchase Migratory Bird Hunting and Conservation Stamps (Federal Duck Stamps) through approved state automated licensing systems. The proof of purchase receipt from this sale, bearing a unique serial number, serves as a permit to hunt migratory waterfowl for a limited time. This program was initiated through the Electronic Duck Stamp Act of 2005 (P.L. 109-266), which directed the Secretary to conduct a three-year pilot program to determine if this approach would provide a cost effective and convenient means for issuing migratory bird hunting and conservation stamps.

In order to hunt migratory birds in the United States, hunters are required by 16 U.S.C. 718(a) et al. to purchase a Federal Duck Stamp and to carry the stamp with them while they are hunting. In September of 2007, the Service initiated the pilot electronic Duck Stamp program (E-Stamp program), partnering with eight states: Arkansas, Colorado, Florida, Idaho, Maryland, Minnesota, Texas, and Wisconsin. Each participating state signed a Memorandum of Understanding to administer the E-Stamp program in cooperation with the Service, through their automated hunting license sales outlets.

Through the E-stamp program, the proof of purchase hunters receive immediately upon purchase serves as a valid permit to hunt migratory waterfowl for up to 45 days from the date of purchase or until the customer receives the physical stamp. Like the physical Federal Duck Stamp, the electronic stamp proof of purchase allows free entry into all national wildlife refuges that charge a fee.

The Electronic Duck Stamp Act of 2005 directs the Secretary to conduct and evaluate a pilot program and submit a report on whether or not the program "has provided a cost-effective and convenient means for issuing migratory-bird hunting and conservation stamps" and whether it has: (1) increased the availability of those stamps, (2) assisted states in meeting the customer service objectives of the states with respect to those stamps, (3) maintained actual stamps as an effective and viable conservation tool, and (4) maintained adequate retail availability of the physical stamp. After conclusion of the pilot program in December 2010, the Service finalized its evaluation, which included review and analysis of data from participating states, and submitted its report to Congress in September 2011.

The E-Stamp pilot program has proven to be a practical method of selling Federal Duck Stamps that is readily accepted by the stamp-buying public. Since the program's inception, more than 600,000 electronic Duck Stamps have been sold. Sales of E-Stamps increased from 58,000 in 2007 to more than 350,000 in 2010, an increase of more than 420 percent. In 2010, E- Stamp sales accounted for more than 27 percent of total Duck Stamp sales nationwide, demonstrating the widespread acceptance of the pilot program. With few exceptions, states reported ease in administering the program, and the pilot program did not negatively affect the availability of the physical stamp or its value as an effective and viable conservation tool. E-Stamps provide an additional avenue of availability for stamp purchasers, though the program has not yet resulted in an increase in overall Federal Duck Stamp sales.

The Service has continued to administer the E-Stamp program under the authority of the Migratory Bird Hunting and Conservation Stamp Act. Although we understand we can continue to administer the program without additional authorities, the Department supports the intent of S. 2071. We appreciate the support it represents for the overall Duck Stamp Program and its role in protecting wetlands that are home to a multitude of species, which, in turn, are enjoyed by those who purchase Duck Stamps.

S. 2156, the Migratory Bird Habitat Investment and Enhancement Act

An increase in the price of the Federal Duck Stamp is a priority for the Department and has been included in the President's budget proposals over the past several years, through the terms of two Presidents. The price of the Federal Duck Stamp is statutorily set through the Migratory Bird Hunting and Conservation Stamp Act. We appreciate Senator Begich's leadership and the approach taken in S. 2156 to accomplish this important increase, and we strongly support the legislation with some simple further clarifications and technical changes.

The restoration of North America's great migratory waterfowl populations is a conservation success story. It is a story that involves sportsmen in partnership with States, Congress, and Federal agencies applying science to habitat protection and restoration. Because of strategic actions taken to conserve key habitats along the four major North American flyways, migratory waterfowl populations are thriving. This work maintains our hunting tradition, and has provided a linchpin for the economies of many states supported by the recreational activities of hunters and outdoor enthusiasts.

The Federal Migratory Bird Hunting and Conservation Stamp, commonly known as the Federal Duck Stamp, plays a critical role in this conservation partnership and its success story. Originally created in 1934, the Duck Stamp represents the permit required by the Migratory Bird Treaty Act of 1918 to hunt waterfowl, and every waterfowl hunter is required to carry one into the field. Ninety-eight percent of the receipts from stamp sales are used to acquire important migratory bird breeding, migration, and wintering habitat, which are added to the National Wildlife Refuge System. Since 1934, sales of the Duck Stamp have helped to acquire more than 5.3 million acres of waterfowl habitat for the Refuge System. These protected lands not only benefit waterfowl, but also countless other wildlife species, as well as increase opportunities for outdoor and wildlife-dependent recreation.

The cost of the Duck Stamp has remained the same since 1991. Based on the Consumer Price Index, the stamp would need to cost more than $24 today to have the same buying power that $15 had in 1991. As an example, in 1991, revenue from the Duck Stamp enabled the Service to acquire 89,000 acres of habitat for the Refuge System at an average cost of $306 an acre. In 2010, the Service was able to acquire significantly less habitat because land values had tripled to an average of $1,091 an acre.

In his FY 2013 Budget Proposal, the President included a legislative proposal to amend the Migratory Bird and Hunting Conservation Stamp Act (16 U.S.C. 718b), to increase the sales price for Duck Stamps from $15 to $25, beginning in 2013. With the additional receipts that would be generated from the proposed price increase, the Service anticipates additional annual acquisition of approximately 7,000 acres in fee and approximately 10,000 acres in conservation easement. Total acres acquired for 2013 would then be approximately 24,000 acres in fee title and 33,000 acres in perpetual conservation easements. These funds can be targeted to acquire habitats for waterfowl that can provide the greatest possible conservation benefit.

S. 2156 would require the Secretary of the Interior to establish a price for the Federal Duck Stamp every 5 years, in consultation with the Migratory Bird Conservation Commission, beginning with calendar year 2013. The price of the stamp would be collected by the U.S. Postal Service if the Secretary determines that all amounts collected during the previous calendar year are obligated. It also would allow the Secretary to waive requirements under the Migratory Bird Hunting and Conservation Stamp Act for such individuals the Secretary, in consultation with the Migratory Bird Conservation Commission, determines to be appropriate. The Department would be glad to work with the Committee as you continue to consider this legislation.

S. 2282, the North American Wetlands Conservation Extension Act

The Department strongly supports S. 2282, which would reauthorize the North American Wetlands Conservation Act (NAWCA). NAWCA was originally passed by Congress in 1989 to support partnership efforts to protect and restore habitats for wetland-associated migratory birds. NAWCA provides matching grants to organizations, agencies, and individuals to carry out wetlands conservation projects in the U.S., Canada, and Mexico. Since its inception, this program has been among the most successful leveraged funding mechanisms for the conservation of wetland habitats that benefit waterfowl and other birds, as well as other wildlife species.

Over the past 22 years we have witnessed remarkable achievements in conservation through this landmark legislation. Partnerships applying NAWCA funds to wetland conservation projects include nationally recognized conservation organizations, State fish and wildlife agencies, local governments, grass-roots organizations, and private landowners. They have supported thousands of cooperative projects across North America, leveraging billions of partner dollars and affecting more than 27 million acres of bird habitats.

Like the Joint Ventures, NAWCA supports activities under the North American Waterfowl Management Plan. However, NAWCA also focuses on the conservation of wetlands nationwide for all birds and wildlife dependent upon wetland habitats. NAWCA is widely recognized for its support of other bird conservation plans, including Partners in Flight, the North American Waterbird Conservation Plan, and the U.S. Shorebird Conservation Plan. The program's connection to these conservation plans was formalized in the 2002 reauthorization of NAWCA.

The maintenance of healthy populations of wetland-associated migratory birds in North America is dependent on the protection, restoration, and management of wetland ecosystems and associated upland habitats in the U.S. as well as in Canada and Mexico. Many North American migratory birds nest in Canada, including waterfowl species that generate the greatest economic gains for states and local economies in the United States. Many of these migratory species depend on southern U.S. and Mexican wetlands for wintering habitat. Wetlands destruction, loss of nesting cover, and degradation of migration and wintering habitat have historically contributed to significant declines in North American birds.

NAWCA projects provide wetland habitat where it is needed across the country and the continent, including in the northern breeding grounds, along widespread migration routes, and in southern

areas where some species spend the winter months. In the critical waterfowl breeding grounds of the prairie pothole region in the north-central U.S., NAWCA has conserved more than 2.1 million wetland and associated grassland acres by leveraging $104 million in Federal funds to generate another $170 million in partner contributions since the start of the program in 1991.

For example, the Missouri Coteau Habitat Conservation Projects have protected and restored wetland and native prairie grassland habitats, which are critically important components of North Dakota's prairie pothole ecosystem. Protecting native prairie surrounding vital prairie pothole wetlands provides essential nesting habitat for waterfowl and other species and minimizes the influx of sediments, herbicides, and pesticides into these wetlands. NAWCA projects along the Samish River in Washington State offer both breeding and migrating habitat. The Whatcom Land Trust has used NAWCA grant funds to add about 100 acres to an existing preserve, permanently protecting more of the freshwater and riparian habitats that provide critical feeding and breeding areas for waterfowl and other migrants.

NAWCA projects are reviewed by the North American Wetlands Conservation Council, which draws its strength from its diverse membership. It is comprised of the Executive Director of the National Fish and Wildlife Foundation, the Director of the Fish and Wildlife Service, four directors of State fish and wildlife agencies representing each of the four migratory bird Flyways, and three non-profit organizations actively involved in habitat conservation. The Council has been widely viewed as a leader in international habitat conservation activities through their implementation of NAWCA.

The key to NAWCA's accomplishments is that it fosters cooperative efforts. Project proposals are developed through local partnerships, basing their objectives on the bird conservation goals and information created on a continental scale, through the North American Waterfowl Management Plan and the other continental bird plans, and using the best science available. These proposals are recommended by a Council of partners, and they are also shared with the Joint Ventures. The Joint Ventures review the proposals based on how well they reflect the habitat goals of the Joint Ventures in the geographic regions in which they occur.

In 2006, Congress reauthorized appropriations for the Act through fiscal year 2012, reflecting the continued support of Congress and the public support for NAWCA's goals. S. 2282 will extend authorization for the Act through fiscal year 2017. We support this bill and look forward to continuing to administer this outstanding program to build on its impressive legacy of accomplishment for both the American people and the wildlife it treasures.

S. 1266, Delaware River Basin Conservation Act of 2011

The Department supports the goals of the Delaware Basin Conservation Act of 2011, and we agree with the legislation's assertion that the Delaware River basin is a national treasure of great cultural, environmental, and ecological importance, and that it is of extraordinary value. The bill would direct the Service to establish a Delaware River Basin restoration program, under which the Director would work with relevant management entities and partners in the four-state Delaware

Basin to identify, prioritize, and implement restoration and protection activities within the Basin. Through the proposal, the Service would provide technical assistance toward restoration and establish and administer a grant program for matching grants to support restoration projects.

The Delaware River is the largest undammed river east of the Mississippi, with 330 miles of unimpeded river flow for numerous federal trust species. The Delaware Bay supports the largest known spawning aggregation of horseshoe crabs, with unique importance to migrating shorebird populations as well as to the biomedical and human health industry. Careful and prudent measures are critical for the effective conservation of this vibrant ecosystem.

The Service believes that the Delaware River basin represents the best example of a wild river system in the eastern U.S. and, as such, it can be used as a standard by which restoration efforts in other river systems are measured. Due to the proximity of the Delaware basin to a large portion of the U.S. population, the Service acknowledges the tremendous economic importance of the Delaware River as a freshwater port, drinking water supply, and as resource that enables many industries to function in the basin. However, we would like the opportunity to work with the Committee to ensure that the restoration program works with existing Service obligations in the region. We would also like to ensure that it is complementary to the North Atlantic Landscape Conservation Cooperative, through which we are working with partners to identify large-scale needs for scientific information that is not only foundational to the success of such an initiative, but can also help ensure that limited resources are used most effectively.

S. 1494, the National Fish and Wildlife Foundation Reauthorization Act of 2011

The Department fully supports S. 1494, the National Fish and Wildlife Foundation Reauthorization Act of 2011. We appreciate the leadership of Chairman Boxer, Chairman Cardin, and the bill's bipartisan cosponsors in continuing Congressional authorization for the National Fish and Wildlife Foundation (Foundation), which plays an important role in funding on-the-ground conservation projects and managing and leveraging taxpayers funds with private contributions. The bill reauthorizes the program through 2015 and makes amendments which strengthen the Foundation's ability to carry out its purposes.

The Foundation was established by Congress in 1984 to encourage, direct, and administer private funding to support fish and wildlife conservation, among other purposes. Its principle purpose is to match public conservation dollars with private funds toward pressing conservation needs. Working with a full complement of individuals, foundations, government agencies, non-profits, and corporations, the Foundation is able to achieve partnerships that can supply both a diversity of funding and ideas to some of our most intractable conservation challenges. Through the authorization of the National Fish and Wildlife Foundation Establishment Act, the Foundation receives federally appropriated funds to forge effective partnerships for locally-driven natural resource conservation efforts that support larger landscape level efforts. The Service works closely with the Foundation to develop and evaluate projects that support the Service's statutory obligations and priorities.

Since 1984, the Foundation has leveraged approximately $576 million into over $2 billion to fund 11,600 grants for on-the-ground projects that benefit conservation in all 50 states. This includes more than 3,700 grants supported with funding through the Service, leveraging $174 million in Service funds into more than $618 million for conservation. Its efforts to increase the public fund investment in the conservation of fish and wildlife resources have yielded an average 3-to-1 ratio in private matching funds, although its statutory requirement is only a1-to-1 match.

The Service's Mission, which is *"working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people"*, is greatly advanced by the work of the Foundation, and we look forward to our continued partnership in the conservation of fish and wildlife resources. The Department supports amendments proposed in S. 1494, and we strongly support reauthorization of the National Fish and Wildlife Foundation.

Conclusion

We greatly appreciate the continued interest and leadership of the Subcommittee in protecting America's fish and wildlife, in your consideration of this important legislation and in working so closely with us on myriad conservation issues. We would be pleased to work with the Committee to improve and clarify provisions in the bills for which we indicated concerns or reservations and to assist you in any way we can as this entire slate of bills continues to be considered.

Environment and Public Works Committee
Legislative Hearing – April 24, 2012
Director Dan Ashe Follow-up Questions for Written Submission

Senator Barbara Boxer

1. Can you please describe the importance of investing in the conservation programs that would be authorized or reauthorized by the legislation considered at this hearing? What wildlife and economic benefits can be expected?

Response: A number of the programs for which legislation was heard by the Senate Environment and Public Works Subcommittee on Water and Wildlife on April 24, 2012 have a long history of benefits to wildlife and to the American economy. Two of these, the Federal Duck Stamp and the North American Wetlands Conservation Act (NAWCA), have provided decades of conservation value for waterfowl and other wetland-dependent wildlife, through the protection and restoration of wetland habitats across the nation. Through these and other programs, the U.S. Fish and Wildlife Service (Service) implements its responsibility to conserve sustainable populations of migratory birds. Alone and in combination with other conservation efforts, these two programs have helped re-establish and sustain healthy waterfowl populations, and they benefit other wetland-dependent species, as well. Ninety-eight cents of each dollar from Federal Duck Stamp sales goes toward the purchase of fee title or easements to protect waterfowl habitat – wetlands and associated uplands. Since its inception in 1934, the Federal Duck Stamp has protected more than 5.3 million acres of such habitat. With the additional receipts that would be generated from the proposed price increase, the Service anticipates the ability to acquire an additional 7,000 acres in fee and 10,000 acres in conservation easement, approximately, each year. Total acres acquired for 2013 would then be approximately 24,000 acres in fee title and 33,000 acres in perpetual conservation easements. These funds are and would be targeted to acquire habitats for waterfowl that can provide the greatest possible conservation benefit.

NAWCA was enacted, in part, to implement the North American Waterfowl Management Plan, which is a tri-partite agreement among the U.S., Canada, and Mexico to recover and sustain North American waterfowl. NAWCA provides federal funds to restore wetlands through partnership projects – wetlands that support waterfowl nesting in the north, migration throughout the continent, and wintering habitat, primarily in the U.S. and Mexico. In the critical waterfowl breeding grounds of the prairie pothole region in the north-central U.S., NAWCA has conserved more than 2.1 million wetland and associated grassland acres by leveraging $104 million in Federal funds to generate another $170 million in partner contributions since the start of the program in 1991.

These programs can provide additional lands for hunting and other wildlife-associated recreation, and they help ensure the birds are there to enjoy for future generations. Waterfowl hunting provides significant economic support to rural communities across the nation, and it serves as an economic anchor for several such communities. According to the Service's Survey of Fishing, Hunting and Wildlife-Associated Recreation, last conducted in 2006, 1.3 million Americans participated in waterfowl hunting and 15.4 million traveled in the country to view or photograph

waterfowl. Migratory bird hunters spent $1.3 billion in trip and equipment-related expenses, while wildlife watchers -- ninety-four percent of which are bird watchers -- spent more than $45.6 billion. Without these and other migratory bird conservation programs, the U.S. and the communities that support hunting and wildlife-watching would not realize these economic benefits.

Since 1984, the National Fish and Wildlife Foundation (NFWF) has leveraged approximately $576 million into over $2 billion to fund 11,600 grants for on-the-ground projects that benefit conservation in all 50 states. This includes more than 3,700 grants supported with funding through the Service, leveraging $174 million in Service funds into more than $618 million for conservation. Its efforts to increase the public fund investment in the conservation of fish and wildlife resources have yielded an average 3-to-1 ratio in private matching funds, although its statutory requirement is a 1-to-1 match. NFWF has provided and will continue to facilitate mechanisms through which the greatest conservation benefit can be achieved through a combination of federal and non-federal funds, and the projects that have funding facilitated through NFWF help ensure fish and wildlife populations are sustained for the enjoyment of all Americans and for the economic support of communities that depend on wildlife-associated recreation.

The Service has acknowledged the tremendous economic impacts of the Delaware River to the highly populated region in which the river basin lies, and a landscape-level approach to conserving its fish and wildlife and other resources can be cost effective. The North Atlantic Landscape Conservation Cooperative is the larger landscape-level effort to identify priority science products needed to conserve fish and wildlife in the region, and participation of the larger Delaware River Basin partnership in the North Atlantic LCC will help ensure that limited resources for conservation science across the region will be used most effectively.

It is difficult to predict the conservation or economic benefits of the Wildlife Disease Emergency Act while it has no identified source of funds. The primary purpose of the Act is to establish a Fund through which the Secretary of the Interior can rapidly dedicate the resources necessary to put into place infrastructure to address emerging diseases that threaten our ecosystems as they arise. With the resources to support a fund, the bill could contribute to ensuring that the Department can mount the necessary response to contain and manage the outbreak of fish and wildlife diseases that threaten their populations in the wild, the ecosystems that support their habitats, and the economic benefits derived from them.

2. Can you please describe the successful partnership with Canada and Mexico on migratory bird conservation? How has the North American Wetlands Conservation Act contributed to this partnership? What benefits do sportsmen in the U.S. receive from conservation efforts in Canada and Mexico?

Response: The U.S. has a long-standing partnership with Canada and Mexico to conserve the migratory bird species we share. Because migratory birds use nesting habitat in northern latitudes, migrating habitat across the continent, and winter habitat in more southern latitudes, their conservation depends upon each nation having laws that prevent unsustainable mortality rates and programs to protect migratory bird habitats. In 1916, the U.S. entered into a treaty with Great Britain (for Canada) to protect birds species that migrate between the two North American

nations. In 1936, the U.S. joined Mexico in signing the Convention between the U.S. and Mexico for the Protection of Migratory Birds and Game Mammals. The Migratory Bird Treaty Act of 1918 (16 USC 703-713) (MBTA) was first enacted in the U.S. to implement our treaty with Great Britain (Canada), and it was later amended to accommodate the provisions of the 1936 treaty with Mexico. It was subsequently amended further to accommodate similar treaties with Japan in 1974 and Russia in 1978.

The MBTA implements the underlying obligation of the United States for the conservation of migratory birds. It prohibits the "take" of protected species without a federal permit, and it provides for conditions under which permits may be given. "Take" includes killing, possessing, transporting, or selling any protected bird or part of a bird, egg, or nest. Despite the measures taken by the Federal government, in partnership with the states, to conserve migratory waterfowl, North American populations of several species declined, and by the late-1970's and early 1980's, the declines were alarming. By 1985, the Service estimated that 53 percent of the original 221 million wetland acres found in the contiguous United States had been destroyed since early settlement, while 29 to 71 percent of wetland losses across Canada were lost in that time frame. In 1986, the United States and Canada signed an agreement, called the North American Waterfowl Management Plan (Plan), to rescue waterfowl populations through regional implementation of management approaches by Federal-state-tribal-private partnerships, called Joint Ventures, and through the financial support of partnership projects specifically to restore wetland habitats through the North American Wetland Conservation Act (NAWCA). In 1994, Mexico also signed on to the Plan. On May 31, 2012, Secretary Salazar joined with representatives from the Canadian and Mexican governments to recommit to the Plan in a revision that addresses three overarching goals for waterfowl conservation: 1) abundant and resilient waterfowl populations to support hunting and other recreational uses without imperiling habitat; 2) sufficient wetlands and related habitats to sustain waterfowl populations at desired levels, while providing places to recreate and ecological services that benefit society; and 3) increasing numbers of waterfowl hunters, other conservationists and citizens who enjoy and actively support waterfowl and wetlands conservation. To implement the Plan, NAWCA, and the Joint Ventures for migratory birds, the Service works closely with relevant agencies in Canada and Mexico.

Senator Tom Carper

1. Based on your expertise as Director of the U.S. Fish and Wildlife Service, can you please expand upon the importance that you mentioned in your testimony of protecting the Delaware River basin watershed? What are some of the risks, ecological, economic and otherwise, that might come to be if investments are not made in protecting the Delaware River?

Response: The Delaware basin, like the Chesapeake Bay and other coastal and aquatic systems, supports myriad native species. A number of these species fall into the Service's Trust species, including those protected by the Migratory Bird Treaty Act and the Endangered Species Act. Within its focused role for conservation in the basin, the Service has pointed out in testimony that the Delaware River is the largest undammed river east of the Mississippi, with 330 miles of unimpeded river flow. This is particularly valuable for the anadromous species that fall within the Service's purview. The Delaware Bay supports the largest known spawning aggregation of

horseshoe crabs, and these are of critical importance to red knots and other shorebirds, as well as to the biomedical and human health industry. To support the conservation of anadromous and other inter-jurisdictional fish species, the Service currently has a Delaware River Coordinator Office. This office works with the four Delaware River basin states: Pennsylvania, Delaware, New York, and New Jersey to assist in all interstate activities related to anadromous fish management and restoration as well as activities related to management and restoration of other inter-jurisdictional fish species with economic or ecological significance in the Delaware basin.

Over 15 million people (approximately five percent of the nation's population) rely on the waters of the Delaware River Basin for drinking, agricultural, and industrial use. This figure includes about seven million people in New York City and northern New Jersey who live outside the basin. New York City gets roughly half its water from three large reservoirs located on tributaries to the Delaware. Management of the water quality and distribution, now the focus of the Delaware River Basin Commission, are of paramount importance to fish and wildlife and among the greatest challenges faced by the human and fish and wildlife inhabitants of the region.

The landscape conservation model for large, aquatic ecosystems has evolved through our experiences in addressing Chesapeake Bay, Everglades, Great Lakes, and other large, aquatic ecosystems and their restoration. Beyond the underlying challenges of preserving or restoring water quality and managing distribution of water to meet human needs, the landscape conservation challenge we face, in part, is identifying the scale at which an aquatic resource should be conserved and at what scale should the scientific research, monitoring, and management tools be developed to identify and address underlying and priority conservation challenges, such as the extraction of fuels or energy production. Environmental conditions and landscape challenges, including climate change, invasive species, disease, and drought can greatly impact the success of more focused fish and wildlife conservation initiatives. To that end, the Service has led the creation of a North Atlantic Landscape Conservation Cooperative in the region in which the Delaware River basin lies. Landscape Conservation Cooperatives (LCCs) are self-directed, multi-partner entities that develop science-based and adaptive tools for conservation at the landscape level, and this approach – including 22 such entities across the nation – was spearheaded by the Department of the Interior through Secretarial Order 3289. The Service encourages the stakeholders involved in the Delaware River Basin initiative to work with the North Atlantic LCC to identify priority landscape-level conservation science needs.

Senator Frank R. Lautenberg

1. The Wildlife Disease Emergency Act would authorize the Secretary of the Interior to declare wildlife disease emergencies and lead cross-agency efforts to fight those diseases. It would also authorize additional resources.

   How could those new tools help your agency address outbreaks of wildlife diseases?

Response: The Service currently has the authority to develop the infrastructure necessary to respond to the outbreak of wildlife diseases and to establish a committee similar to that described in Section 6. The new authority proposed in S. 357 for the Secretary – to enable the Secretary to declare a "Wildlife Disease Emergency"— would be of assistance to the agency in dedicating resources to the rapid establishment of infrastructure necessary to quickly assemble partners,

identify and conduct or contract necessary research, and identify and implement management steps to contain or eradicate the disease. However, without an identified funding source to support the Wildlife Disease Emergency Fund, the effect of this authority, beyond the Service's existing authorities, is limited.

2. In the last few years, the Delaware River Basin has experienced serious flooding on a regular basis.

   What conservation and habitat restoration programs could you implement under the Delaware River Basin Conservation Act that would also help control flooding in the region?

Response: The Service anticipates a role under the Delaware River Basin Restoration Act that coordinates and supports the functions of existing Federal and state agencies and regional entities, such as the Delaware River Basin Commission, in carrying out their existing and separate statutory authorities and responsibilities. One of the ways habitat restoration and conservation provides benefits to society is by restoring fully functioning wetlands and riparian habitats, which mitigate the impacts of flooding. Accordingly, under the legislation, the Service would continue to work with the relevant states and other stakeholders to restore fully functioning wetlands and other riparian habitats in the watershed. In addition to mitigating the impacts of flooding, investments in proactive, on-the-ground habitat restoration provide significant conservation benefit to migratory birds, anadromous fish, and threatened and endangered species and also buttress the ecosystem services on which we so critically depend. Another key consideration is that each of these benefits enhance the economy, including by reducing flood damage and enhancing opportunities for wildlife dependent activities.

Senator Benjamin Cardin

Target Practice and Marksmanship Training Support Act (S. 1249)

1. Does the Service support use of funds to develop and maintain shooting ranges?

   a. Why/why not?

Response: The Pittman-Robertson Wildlife Restoration Act (16 U.S.C. 669-669i) authorizes the Secretary of the Interior to cooperate with the States, through their respective State fish and game departments, in wildlife-restoration projects. The Act also provides for grants for a variety of uses including reintroduction of declining wildlife species, wildlife population surveys, species research, hunter education, acquisition of wildlife habitat, and public target ranges. S. 1249, the Target Practice and Marksmanship Support Act, would amend the Pittman-Robertson Wildlife Restoration Act to change the funding requirements to allow up to 90 percent of target range

construction and maintenance to be paid for with Pittman-Robertson funds, thus reducing the match burden on state and local governments. The Department supports S. 1249 because it creates an opportunity for young Americans to learn about responsibility, about dedication, about accomplishment. Yes, we support the use of funds to develop and maintain shooting ranges.

2. Do you see detrimental impacts to FWS wildlife conservation and protection efforts resulting from shooting ranges on public lands?

Response: The Service does not maintain shooting ranges on public lands and therefore does not possess comprehensive data on the impacts to wildlife conservation and protection from these areas. Any potential detrimental impacts to wildlife conservation and protection from a proposed shooting range construction and operation would be evaluated through an environmental assessment in accordance with the National Environmental Policy Act.

a. Are these impacts offset by potential benefits to local economies or state revenues?

Response: The Service does not maintain data on the benefits to local economies or state revenues generated by shooting ranges on public lands. The 1991 Survey of Fishing, Hunting and Wildlife-Associated Recreation included questions about hunters participating in target shooting, but the Service did not pursue this data in the 1996, 2001, or 2006 surveys, and the 1991 data did not represent all target shooters.

b. Could FWS mitigate these negative impacts to wildlife?

Response: As noted above, the Service does not maintain shooting ranges on public lands and therefore does not possess comprehensive data on the impacts to wildlife conservation and protection from these areas. The Service believes that any impacts to wildlife can be addressed through current laws, regulations and policies.

Delaware River Basin Conservation Act (S. 1266)

3. As we've seen in the Chesapeake Bay, regional coordination on large water bodies is one of the most effective ways to protect the habitats of wildlife dependent on these systems and improve overall improve environmental conditions.

a. Does FWS suggest any corrections to the bill to ensure that this legislation is an effective conservation tool? Please elaborate.

Response: The Service is concerned that the legislation, as statute, could be interpreted to overlap the statutory authorities and obligations of existing federal and state agencies and regional entities, such as the Delaware River Basin Commission, the Environmental Protection Agency, the U.S. Army Corps of Engineers, and relevant state agencies with jurisdiction over those waters. Section 4(b) should be redrafted to clarify that: 1) the Secretary's role is in coordinating (and not implementing) the conservation work occurring in the basin beyond its existing statutory authorities. Section 4 (c), entitled "Coordination" should be followed by direction for the Secretary to coordinate, not "consult" with the list of agencies that follow. Absent these changes, the Service recommends including a clause which clearly states that the

Act is not intended to supersede existing federal authorities or state jurisdiction.

North American Wetlands Conservation Extension Act (S. 2282)

4. The North American Wetlands Conservation Act provides an excellent return on every federal dollar spent. For each federal dollar used in the program, the average match is over three dollars. This wetlands conservation protects a range of wildlife.

    a. Does FWS support this bill?

Response: The Service strongly supports reauthorizing the North American Wetlands Conservation Act (NAWCA). S. 2282 would simply authorize this program through 2017.

    b. Does FWS recommend any alterations to the bill?

Response: The Service appreciates the Committee's leadership in supporting and perfecting NAWCA throughout its history. No further statutory changes are needed at this time.

Senator James Inhofe

1. You mentioned that 70% of the prairie wetlands are in private ownership. In your opinion, are land owners in this area of the country willing to take part in voluntary conservation efforts?

Response: Based on our experience in implementing wetland conservation programs under our authority and in our work with USDA's Natural Resource Conservation Service in implementing the Farm Bill's Wetland Restoration Program, more landowners are interested in wetland restoration project support, on a voluntary basis, than there are Federal funds to accommodate them.

2. How do you coordinate conservation efforts with other federal agencies to ensure minimizing duplication and maximizing proper use of federal funds? How do you coordinate with private and state efforts?

Response: The Service has responsibility, directed by Congress, for the conservation of certain wild and native fish, and wildlife species of national significance. These statutes include the Endangered Species Act, the Migratory Bird Treaty Act, the National Wildlife Refuge System Administration Act, the Federal Aid in Sportfish Restoration Act, and the Federal Aid in Wildlife Restoration Act. In the implementation of our statutory responsibilities, the Service engages the states, with which we share federal and state statutory obligations, respectively, to conserve. These include federally endangered or threatened species, migratory birds, and certain species of anadromous fish. We have developed efficient and effective partnerships and joint processes to carry out these obligations, some of which date to the turn of the 20th Century, and these partnerships have demonstrably contributed to the restoration of fish and wildlife populations and to the provision of hunting, fishing and wildlife-associated recreation. Although the Service manages National Wildlife Refuges for purposes directed by Congress, we work closely with state wildlife agencies and local governments to ensure that

the purpose of each Refuge is supported by local policies and constituents. Congress has directed or authorized the Service to carry out a wide range of conservation partnership programs, and the Service works to ensure that funds appropriated for these purposes are directed toward projects that are in line with Congressional direction and that address priorities shared by all relevant partners. In addition, the Service has initiated partnerships under existing authorities, to implement its conservation responsibilities, such as the Joint Ventures for migratory birds. These landscape level partnerships not only strengthen the cooperative work of the partners, including states, tribes, other federal agencies, private organizations, and academic institutions, but they also help clarify the roles of each partner so that duplication of effort is minimized. The Service has led the development of several Landscape Conservation Cooperatives (LCCs) and is now a partner in all 22 of these self-directed, multi-partnered entities – including relevant Federal, state, tribal and local government agencies – to identify priority science needs and to develop science-based, adaptive conservation tools to address landscape-level challenges to fish, wildlife, and other natural and cultural resources. Through LCCs, spearheaded by the Department of the Interior through Secretarial Order, all participating agencies that are statutorily or otherwise responsible for these resources can pool together and maximize the conservation value of limited resources by reducing redundancies and magnifying the effectiveness of each partner.

Senator Jeff Sessions

1. Would S. 2071 (the Permanent Electronic Duck Stamp Act) allow the States to save some costs over current practice? Would it be easier for purchasers of duck stamps if they had an electronic option? Would duck hunters, who prefer receiving the paper duck stamp, still be able to obtain the traditional stamps?

Response: P.L. 109-266 required the Service to conduct a pilot program to offer the sale of electronic Federal Duck Stamps and to prepare a report to Congress to describe its results. The report was released in August of 2011. The Service included data in the report to show that the percentage of total Federal Duck Stamp sales purchased online in each participating state increased during the first two years. In several participating states, the increase was dramatic, indicating that this mechanism appeals to Duck Stamp purchasers. All waterfowl hunters must carry a paper stamp into the field, and each hunter purchasing a Federal Duck Stamp receives a paper stamp. Hunters purchasing the Federal Duck Stamp online will receive a paper Duck Stamp in the mail, but they may use their receipt from the online sale – with its unique serial number – for 45 days after its purchase. Each state has its own game laws and administrative process for issuing hunting licenses, including Federal Duck Stamps. The Service has not surveyed the states for relative costs of administering the direct Duck Stamp sales versus electronic sales, but the current law allows the states to charge "a reasonable fee" to recover costs associated with the electronic Duck Stamp sales. All but one of the participating states has charged a fee, ranging from $1 per stamp to $3.50 per stamp.

2. Our federal debt is unsustainable. All programs have to take a serious look at doing with less. In your view, is it possible to reauthorize programs like the National Fish & Wildlife Foundation program at somewhat reduced authorization levels and still accomplish the program's primary objectives? If so, what level would be appropriate in your view?

Response: The Service will do everything possible to maximize the conservation value of every dollar appropriated by Congress for this and other programs. The National Fish and Wildlife Foundation (NFWF) is a highly efficient conduit for federal conservation dollars, and cutting funds for NFWS would also eliminate this facilitator of nonfederal funds for important projects. However, the Service defers to NFWF regarding what specific authorization level is necessary to accomplish its primary objectives.

3. The Fish & Wildlife Service plays an important role in administering the North American Wetlands Conservation (NAWCA) program. My understanding is that NAWCA currently requires 30-60% of the program's funds to be spent on projects in Canada and Mexico. Should this committee give consideration to recalibrating that percentage, to increase the amount of conservation dollars spent in the United States? How much is Canada spending on wetlands conservation programs of a similar nature to NAWCA?

Response: Most North American waterfowl nesting habitat lies in Canada, and Mexico contains important winter habitat for many of these species. Migratory waterfowl species depend on nesting habitat in northern latitudes, migrating habitat across the continent, and winter habitat in more southern latitudes, and it is critical to invest in conservation of these habitats to meet their transcontinental and seasonal needs. NAWCA was enacted as part of the implementation of the North American Waterfowl Management Plan (the Plan), a tri-partite agreement among the United States, Canada, and Mexico, initiated in 1986 by Canada and the U.S. to combat historical declines in waterfowl recorded in the late 1970's and early 1980's. NAWCA is the mechanism through which wetland acres -- prime waterfowl habitat -- are conserved and restored through partnership projects across the nation and in Canada and Mexico. Because much of the nesting habitat for our waterfowl species lies in Canada, the Service recommends that NAWCA funds, as appropriate, be spent on Canadian projects. A smaller percentage of funds are invested in Mexico to conserve winter habitat for those species that migrate to Mexico. At this time, the Service does not believe it is appropriate, for the purposes of waterfowl conservation, to recalibrate the percentage of NAWCA funds that may be invested in Canada and Mexico. It is simply not possible to capture, within the borders of the U.S., the significant, latitude-dependent waterfowl nesting habitat found in Canada or the important wintering habitat found in Mexico. The current flexibility of percentages of NAWCA funds that may be awarded to projects in Canada and Mexico ensures that the Service can apply all available funding to the most productive projects across the continent each year. NAWCA projects in Canada are matched with Canadian funds. The Service would be pleased to provide a detailed account of Canadian NAWCA projects. The Service defers to the Canadian government to provide detailed accounting of other spending its Federal government, provincial governments, or private organizations spend on wetland restoration.

4. NAWCA currently requires a 1:1 match for federal dollars, but I understand that the program is highly competitive and over-subscribed. I also understand that, on average, NAWCA obtains a 3:1 level of non-federal matches for projects. That is very good. Should this committee consider recalibrating the ratio to maximize the ability to leverage non-federal support for our scarce federal dollars?

Response: Although it is possible for NAWCA projects to achieve a 3:1 match, the current

match gives the Service the flexibility to apply available funds toward projects that will yield the greatest benefits to waterfowl and other wetland-dependent migratory bird species across the continent and in the United States. Although more applications are received than can be funded, not all projects are equally valuable to these resources. The Service is usually able to fund all of the highest quality projects proposed. Setting the bar for match at 3:1 in statute would eliminate funding for many projects that have significant value for wetland habitat conservation. In the prairie pothole region, where most North American waterfowl species nest, matches for NAWCA projects on average remain at about 1:1.

5. The Fish & Wildlife Service recently entered settlement agreements with environmental organizations whereby your agency agreed to publish listing determinations for more than 750 species-more than 150 of which are in Alabama. This is an enormously expensive undertaking that re-shuffled federal priorities under the Endangered Species Act without the involvement of Congress. In November, Sen. Inhofe and I asked your agency to provide us with copies of communications between your agency and the plaintiffs related to the litigation and settlement agreements. Your agency responded that the documents were protected by "attorney-client privilege." We did not agree with your agency's response, as no attorney-client relationship existed between the government and plaintiffs. On March 23rd, you wrote a letter to me stating that the documents would not be disclosed because of a federal district court's "local rules" that prohibit disclosure of "any written or oral communication made in connection with or during any mediation session."

    a. Wouldn't you agree that, as the Ranking Members of the EPW Committee and Water & Wildlife Subcommittee, Sen. Inhofe and I have oversight responsibilities with regard to these issues?

    b. Has your agency sought leave of court to provide any documents that are responsive to our request?

    c. Could you tell us when mediation began in this litigation, and how many responsive documents in your agency's possession were produced either before mediation began or after it was concluded?

    d. Will you give me your personal assurance that your agency will do everything it can, within the law, to ensure that Sen. Inhofe and I are able to review all documents that are responsive to our request?

Response: We agree that the Senate Environment and Public Works Committee has oversight responsibility for issues related to the Endangered Species Act. In this regard, it is important to clarify that these settlement agreements neither re-shuffled federal priorities nor resulted in enormous expense. The settlements actually reflect our biological priorities and restore our ability to set biologically-driven priorities in the future. We can meet all of our obligations under these settlements within our current funding levels.

Your questions were also raised in your May 24, 2012, letter, co-signed by Senator Inhofe, and

we are working closely with our legal counsel in the Office of the Solicitor and the Department of Justice on the response, which we will provide under separate cover. The Service is committed to working with you to address your information request in a manner that respects the bureau's confidentiality interests and legal obligations.

Senator CARDIN. Thank you, Mr. Ashe.

Dr. Anderson.

STATEMENT OF JAMES M. ANDERSON, M.D., PH.D., DIRECTOR, DIVISION OF PROGRAM COORDINATION, PLANNING AND STRATEGIC INITIATIVES, THE NATIONAL INSTITUTES OF HEALTH

Dr. ANDERSON. Good morning, Mr. Chairman and members of the Subcommittee.

I am pleased to testify about NIH's efforts to implement the recent recommendations offered in a December 15, 2011, report by the Institute of Medicine [IOM] and accepted by the NIH regarding the use of chimpanzees in NIH-supported research.

As the Subcommittee begins consideration of S. 810, the Great Ape Protection and Cost Savings Act, I look forward to discussing the recommendations of the IOM and NIH's efforts to implement them as we continue to focus on our mission of improving human health and saving lives.

The use of animals in research has enabled scientists to identify new ways to treat illness, extend life, and improve health and well-being. Chimpanzees are our closest relatives in the animal kingdom, providing exceptional insight into human biology and the need for special consideration and respect. NIH is deeply committed to the care and welfare of chimpanzees.

While used very selectively and in limited numbers, research involving chimpanzees has served an important role in advancing human health in the past. Just a few examples, contributing significantly to the development of oral vaccine for polio and the vaccines for hepatitis A and B, developing FDA approved antibodies for the use and treatment of lymphomas and other cancers, and pioneering new uses for immune cells in cancer immunotherapy.

However, new methods and technologies developed in the biomedical community have provided alternatives to the use of chimpanzees in several areas of research. Consequently, in December 2011, with the encouragement of Senator Udall on this Subcommittee and other Members of Congress, NIH commissioned a study by the IOM to assess whether chimpanzees are or will be necessary for biomedical and behavioral research.

A year later, December 15, 2011, the IOM issued its findings and concluded, among others, that the use of chimpanzees in current and future research should be guided by specific principles and criteria. And based on these principles, they concluded that most current use of chimpanzees for biomedical research is unnecessary with the exception of some areas that may still require their use.

Of special relevance to today's hearing, they also concluded that new, emerging, or re-emerging infectious diseases may present challenges that defy non-chimpanzee models and therefore may require that chimpanzees be used in future research.

After accepting the IOM recommendations, NIH immediately halted issuance of any new awards for research involving chimpanzees until processes for implementing the recommendations are in place.

In addition, the NIH has assembled a working group within the NIH Council of Councils—that is a Federal advisory committee—

to provide advice on the implementation of the IOM recommendations and to consider the size and placement of active and inactive populations of NIH-owned or supported chimpanzees.

The working group began their work in early February of this year, and NIH anticipates they will present their final report during a session of the Council of Councils in early 2013. After the Council considers the working group's report and recommendations, the NIH will open a 60-day public comment period on the implementation of the report and recommendations.

Throughout this process, NIH remains committed to conducting and supporting high quality science in the interest of advancing public health and to the humane care of animals used in NIH research. Animals used in federally funded research are protected by laws, regulations, and policies to ensure the greatest commitment to their physical and emotional comfort and welfare.

I would like to close by thanking the Subcommittee for inviting NIH to provide an update on its activities to implement the IOM recommendations. I want to assure you, Mr. Chairman and members of the Subcommittee, that we place the appropriate care and use of animals as a fundamental principle at the core of all our research activities.

I would be happy to try and answer any questions.

[The prepared statement of Dr. Anderson follows:]

DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

Witness appearing before the

Senate Environment and Public Works Committee

Subcommittee on Water and Wildlife

James Anderson, M.D., Ph.D.
Director of the Division of Program Coordination, Planning, and Strategic Initiatives, NIH

April 24, 2012

Good afternoon, Mr. Chairman, Ranking Member Sessions and Members of the Subcommittee. I am James Anderson, the Director of the Division of Program Coordination, Planning, and Strategic Initiatives ("the Division") in the Office of the Director at the National Institutes of Health (NIH), an agency of the U.S. Department of Health and Human Services. I am pleased to appear before you today to testify about NIH's efforts to implement recent recommendations offered in a December 2011 report[1] by the Institute of Medicine (IOM) and accepted by NIH regarding the use of chimpanzees in NIH-supported research. As the Subcommittee begins consideration of S. 810, the Great Ape Protection and Cost Savings Act, I look forward to discussing the recommendations of the IOM and NIH's efforts to implement them as we continue to focus on our mission of improving human health and saving lives.

About the Division

First, I would like to tell you about the Division and its role in NIH-supported chimpanzee research and in implementing the IOM report recommendations. Among its activities, the Division plans and implements trans-NIH, transformative initiatives and coordinates research across NIH related to AIDS, behavioral and social sciences, women's health, disease prevention, and – more recently and relevant to this hearing – research infrastructure. Included in the mission of the research infrastructure office is NIH's Chimpanzee Management Program, a program that supports long-term, cost-effective housing and maintenance at facilities for chimpanzees. The Chimpanzee Management Program provides programmatic oversight of the facilities and ensures they comply with the Animal Welfare Act, and policies concerning laboratory animal care and use. These activities were previously supported by the National Center for Research Resources (NCRR). As a result of a recent organizational change within the NIH, independent of the IOM report, the Division gained this and other research infrastructure activities from NCRR..

[1] http://www.ncbi.nlm.nih.gov/books/NBK82797/pdf/nap13257.pdf

The Division is advised by the NIH's Council of Councils, a Federal Advisory body composed of approximately 27 members selected from the NIH Institutes and Centers' Advisory Councils and broad lay representation, including a member of the NIH Council of Public Representatives. The Council advises the NIH Director and me on matters related to the policies and activities of the Division. A working group of this Council is currently developing recommendations on how NIH should implement the IOM recommendations.

Background

The use of animals in research has enabled scientists to identify new ways to treat illness, extend life, and improve health and well-being. Chimpanzees are our closest relatives in the animal kingdom, providing exceptional insights into human biology and the need for special consideration and respect. NIH is deeply committed to the care and welfare of chimpanzees.

While used very selectively and in limited numbers for medical research, research involving chimpanzees has served an important role in advancing human health in the past. For example:

- Contributing significantly to the development of vaccines against hepatitis A and B infection that are in use today. These vaccines most often are given as pediatric immunizations. Since 1991, there has been a 98 percent decline in hepatitis B in children under the age of 15 years. The rate of new hepatitis A infections in the United States declined by more than 92 percent between 1995 and 2008.
- Determining that dietary salt is a major causative factor of elevated blood pressure (Denton et al., 1995).
- Developing FDA-approved monoclonal antibodies for use in treating lymphomas and other cancers, and establishing that certain in vitro differentiated immune cells can serve as vehicles for cancer immunotherapy (Larsson et al., 2004).

However, new methods and technologies developed by the biomedical community have provided alternatives to the use of chimpanzees in several areas of research..

About the IOM Report

In December 2010, with the support from Senator Udall on this subcommittee and other members of Congress, NIH commissioned a study by the IOM to assess whether chimpanzees are or will be necessary for biomedical and behavioral research in today's advanced technological environment. Specifically, the IOM committee reviewed the current use of chimpanzees for biomedical and behavioral research and explored contemporary and anticipated future alternatives to the use of chimpanzees in biomedical and behavioral research that will be needed for the advancement of the public's health.

A year later on December 15, 2011, the IOM issued its findings. The IOM concluded that:

- The use of chimpanzees in current and future research should be guided by the following principles and criteria (pp. 4-5):
    - The knowledge gained must be necessary to advance the public's health.
    - There must be no other research model by which the knowledge could be obtained, and the research cannot be ethically performed on human subjects.
    - The animals used in the proposed research must be maintained either in ethologically appropriate physical and social environments (i.e., as would occur in their natural environment) or in natural habitats.
- Based on these principles, the IOM concluded that most current use of chimpanzees for biomedical research is unnecessary, with the exception of some areas of research that may still require their use, including (pp: 4-5):
    - some ongoing research on monoclonal antibody therapies;
    - research on comparative genomics; and

  - non-invasive studies of social and behavioral factors that affect the development, prevention, or treatment of disease.
- The committee was evenly divided on the necessity of the chimpanzee for the development of prophylactic hepatitis C virus vaccine.
- New, emerging, or re-emerging infectious diseases may present challenges that defy non-chimpanzee models and therefore, may require that chimpanzees be used in future research.
- NIH should continue development of non-chimpanzee models and technologies.

After careful consideration, the NIH Director decided to accept the IOM recommendations, and announced that NIH was in the process of developing a plan for implementing the IOM's guiding principles and criteria. Upon accepting the IOM recommendations, NIH immediately halted issuance of any new awards for research involving chimpanzees until processes for implementing the recommendations are in place. In addition, the NIH has assembled a Working Group within the Council of Councils to provide advice on the implementation of the IOM recommendations, and to consider the size and placement of the active and inactive populations of NIH-owned or -supported chimpanzees.

Status of the Working Group

The Working Group was officially charged on February 1, 2012 and held their first meeting a day later, on February 2. They have been charged with:

- Developing a plan for implementation of the IOM's guiding principles and criteria;
- Analyzing currently active NIH-supported research using chimpanzees to advise on which studies currently meet the principles and criteria defined by the IOM report and advising on the process for closing studies if any do not comply with the IOM recommendations;
- Advising on the size and placement of active and inactive populations of NIH-owned or NIH-supported chimpanzees that may need to be considered as a result of implementing the IOM recommendations; and

- Developing a review process for considering whether potential future use of the chimpanzee in NIH-supported research is scientifically necessary and consistent with the IOM principles.

Ongoing research involving NIH-owned or -supported chimpanzees is currently being reviewed on a project-by-project basis by the NIH Working Group to assess whether it meets the IOM principles and criteria. Projects that are found not to meet those standards will be phased out, but in a fashion that preserves the value of research already conducted, and minimizes the impact on the animals involved. Therefore, until the NIH Working Group has made their recommendations, currently funded projects will continue.

NIH welcomes public input into the Working Group's deliberations. In fact, the NIH has already begun seeking public input to further inform the Working Group's deliberations through a Federal Register Notice that was published in February. Our public website[2] provides information about the members of the Working Group, their charge, and upcoming Council of Councils meetings. With regard to timing, the Working Group will update the Council of Councils during the open session of the June 5, 2012 meeting, and again in September 2012. The NIH anticipates that the Working Group will present its final report during an open session of the Council of Councils in early 2013. After the Council considers the Working Group's report and recommendations, the NIH will open a 60-day public comment period on the implementation of the report and recommendations.

NIH's Commitment to Care and Welfare

Throughout this process, NIH remains committed to conducting and supporting high-quality science in the interest of advancing public health, and to the humane care and use of animals used in NIH research. It cannot be emphasized enough that **all** animals used in Federally-funded research are protected by laws,

[2] http://dpcpsi.nih.gov/council/working_group.aspx

regulations, and policies to ensure the greatest commitment to their physical and emotional comfort and welfare.

Since 2001, the animals housed in our four chimpanzee facilities constitute a closed colony; no new animals are introduced into this population from non-NIH facilities and none are transferred to other chimpanzee populations, such as zoos, other entertainment, or wild populations. This policy helps to ensure these chimpanzees are maintained as a unique and distinct population based on highly regulated and monitored welfare and guaranteed lifetime care and housing. NIH-supported chimpanzee facilities are uniquely designed for these large animals, including indoor housing with air conditioning/heating, special wall furniture, and outdoor housing tailored to chimpanzee size and behavior. In 2002-2004, NIH constructed a Federal sanctuary facility operated by Chimp Haven to provide lifetime housing for approximately 130 Federally-owned chimpanzees that have been retired from research.

Based on an analysis of the most recent awards and payments, NIH spends an average of $35 per day per chimpanzee (n=421) in research facilities; $47 per day per chimpanzee (n=119) in the Federal sanctuary facility operated by Chimp Haven; and $67 per day per chimpanzee (n=173) in the research reserve facility at Alamogordo Primate Facility.

Closing

I would like to close by thanking the subcommittee for inviting NIH to provide an update on its activities to implement the IOM recommendations. NIH shares the concern over animal welfare, and I want to assure you Mr. Chairman and Members of the Subcommittee, that we place the appropriate care and use of animals as a fundamental principle at the core of all of our research activities. The agency also is driven by its mission to improve human health and save lives: for example, deaths of children from leukemia and other loved ones from heart disease, and illnesses from liver disease have been prevented through the use of animal models to develop treatments and vaccines.

While we pursue this mission, NIH seeks to minimize the use of animals wherever possible to find appropriate alternatives. As we continue to manage an important population of animals -- our Federally supported chimpanzees -- we look forward to hearing the Working Group's recommendations on how the agency should implement the IOM recommendations.

Thank you for the opportunity to present this update to you. I will be happy to try to answer any questions.

QUESTIONS FOR THE RECORD

Legislative Hearing (Including the Great Ape Protection Act- S. 810)
Water and Wildlife Subcommittee of the Senate Environment and Public Works Committee
April 24, 2012

Boxer questions:

1) **Is it correct that the Institute of Medicine (IOM) concluded that the "present trajectory indicates a decreasing scientific need for chimpanzee studies due to the emergence of non-chimpanzee models and technologies" and recommended that the NIH significantly limit the use of chimpanzees in biomedical research, unless the proposed research meets a specific set of criteria?**

   Answer: Yes. The use of chimpanzees for biomedical research is decreasing. Scientists develop new technologies and these new technologies are used to develop better ways to answer specific biomedical questions and this reduces the use of animal models to answer those questions. The IOM recommended limiting the use of chimpanzees to specific research applications and these research applications should meet a specific set of criteria.

   Do the criteria outlined by the IOM offer a promising framework for evaluating future research needs and reducing the use of chimpanzees in medical research?

   Answer: Yes. The principles and criteria outlined by the IOM provide a framework to evaluate the need for future research and the NIH expects this will result in a reduction in the use of chimpanzees in biomedical research. The NIH is now in the process of developing a complete plan for implementation of the IOM's guiding principles and criteria. The NIH has assembled a working group within the NIH Council of Councils to provide advice on the implementation of the recommendations, and to consider the size and placement of the active and inactive populations of NIH-owned or -supported chimpanzees.

Cardin questions:

1) **The Institute of Medicine recently released a report assessing the need for chimpanzee use in NIH-funded biomedical and behavioral research. The report concluded that most current biomedical research use of chimpanzees is not necessary, but did not endorse an outright ban on chimpanzee research. Instead, the report established a set of uniform criteria to guide current and future research of chimpanzees.**
   a. **Could you identify what specific modifications could be made to the bill that would incorporate the Institute of Medicine's and NIH's initial concerns?**

      Answer: HHS is currently reviewing the bill.

   b. **Does NIH have any concerns about tailoring a statutory exception for research in line with the Institute of Medicine's recommendations?**
      i. **How should such an exception be written?**
      ii. **What key ideas should be included?**

Answer: We would be happy to provide technical assistance for any possible legislative language that would provide a statutory exception in line with the Institute of Medicine's recommendations. The NIH would suggest flexibility, so that the working group can continue its work. The working group has been meeting with experts and reading all the public comments we received in April on how to proceed. They are doing a thorough job which will result in an informed set of recommendations. NIH expects interim recommendations in September with a final report in January 2013. At that point, NIH will seek public comment on the proposal before it is final. We are moving swiftly while being certain to ensure appropriate consideration of public comment.

2) **Would this legislation, if implemented, represent a cost increase or a cost savings as compared with the current treatment of great apes? Please elaborate.**

Answer: HHS is currently reviewing the bill.

There are two types of costs associated with the long-term care of chimpanzees owned by the NIH: appropriate facility construction and chimpanzee care and welfare costs. Below, is a summary of current costs associated with long-term care of chimpanzees.

Facility Construction Costs

Chimpanzee facilities are uniquely designed for these large animals, including indoor housing with air conditioning/heating, special wall furniture, etc., and outdoor housing tailored to chimpanzee size and behavior. In 2002-2004 NIH spent approximately $11.8 million to construct a federal sanctuary facility operated by Chimp Haven, Inc. to appropriately house 130 federally-owned chimpanzees over their life-time. In today's economy at the same location the anticipated construction cost would be $125K per animal. We estimate that construction of additional Federal Sanctuary space to retire the remaining ≈600 NIH –owned chimpanzees would cost at least $75M.

Chimpanzee Care and Welfare

Based on the most recent posting of awards and payments for maintaining chimpanzee care and welfare (http://grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm), NIH is spending an average of $35 per day per chimpanzee in research facilities; $67 per day per animal for chimpanzee in the research reserve facility at Alamogordo Primate Facility (APF); and $47 per day per chimpanzee in the federal sanctuary facility operated by Chimp Haven, Inc. The average cost for non-sanctuary facilities becomes $44 per day if the research reserve facility at APF is included. See Table 1 for detailed figures.

Costs for chimpanzee maintenance vary among research facilities based on local economy, size of the facility (some facilities have thousands of monkeys in addition to chimpanzees), and the amount of research conducted. Research facilities also have more extensive hospital and emergency care capabilities and a larger veterinary care staff than sanctuaries. Companies that use chimpanzees for research studies pay for care and maintenance, and any specialized procedures, reagents, or personnel during the course of the study. A general animal use fee is also charged. These fees go into reducing the cost to the government.

Table 1 demonstrates how the cost to maintain chimpanzees is affected by their use or non-use in research. The Southwest National Primate Research Center (SNPRC) has two colonies. The P51 colony is part of a large primate facility that was awarded funds prior to the current ban on new chimpanzee research. The original budget request provided to NIH to cover the costs of chimpanzees over a five-year grant period was based on anticipated savings from program income derived from the use of chimpanzees in research protocols ($22.4/day/animal). More recently, the same facility received another award, U42, to cover the care and maintenance of chimpanzees that were not anticipated to be used in research; the cost is $56.3/day/animal. The quality of care is identical for the two populations, but the cost differs because of research use.

The New Iberia Research Center (NIRC) U42 costs ($28.8/day/animal) are similar to the SNPRC P51 costs because of a similar amount of research use. The Keeling-Center for Comparative Medicine Research (K-CCMR) costs ($45.5/day/animal) are higher due to less research than either SNPRC or NIRC and K-CCMR is a smaller facility. The Alamogordo Primate Facility costs ($67.4/day/animal) are the highest because research has never been allowed, and it is the smallest facility.

Udall questions:

1) **It is my understanding that the NIH is now working on a plan to implement the recommendations of the IOM study of the necessity for Chimpanzees in Biomedical Research that was released in December of last year.**
   a. **Is the NIH planning to issue any new funding or contracts involving chimpanzees before the new implementation plan is in place?**

      Answer: No. Upon acceptance of the IOM recommendations, NIH immediately halted issuance of any new awards for research involving chimpanzees until processes for implementing the recommendations are in place.

   b. **Is the team putting the implementation plan together considering the use of chimpanzees in ongoing research?**

      Answer: Ongoing research involving NIH-owned chimpanzees is being reviewed on a project-by-project basis by the NIH working group to assess whether it meets the IOM principles and criteria. Projects that are found not to meet those standards will be phased out in a fashion that preserves the value of research already conducted and minimizes the impact on the animals. Until the NIH working group has made these recommendations, currently funded research continues.

2) **It is my understanding that the laboratory Texas Biomed received funding from the NIH in September 2011 to use 25 chimpanzees from the Alamogordo Primate Facility in invasive research.**
   a. **Is there currently any active research being conducted on the Alamogordo chimps at Texas Biomed or are all the tax dollars allocated to this private laboratory for these chimps simply for care and maintenance?**

      Answer: There is no research being conducted with the 25 chimpanzees from APF now located at the Texas Biomed facility. The funding provided is for high quality care for

these animals. These funds for care and maintenance will continue for as long as the animals remain at this facility.

Inhofe question:

1) **Can you expand on the cost of maintaining chimpanzees in research facilities? Is it cheaper than keeping them in Federal sanctuary facilities such as Chimp Haven?**

Answer: There are two types of costs associated with the long-term care of chimpanzees owned by the NIH: appropriate facility construction and chimpanzee care and welfare costs. Below, is a summary of current costs, which depend on a number of factors.

Facility Construction Costs

Chimpanzee facilities are uniquely designed for these large animals, including indoor housing with air conditioning/heating, special wall furniture, etc., and outdoor housing tailored to chimpanzee size and behavior. In 2002-2004 NIH spent approximately $11.8 million to construct a federal sanctuary facility operated by Chimp Haven, Inc. to appropriately house 130 federally-owned chimpanzees over their life-time. In today's economy at the same location the anticipated construction cost would be $125K per animal. We estimate that construction of additional Federal Sanctuary space to retire the remaining ≈600 NIH –owned chimpanzees would cost at least $75M.

Chimpanzee Care and Welfare

As of December 2011 (http://grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm), NIH is spending an average of $35 per day per chimpanzee in research facilities; $67per day per animal for chimpanzee in the research reserve facility at Alamogordo Primate Facility (APF); and $47 per day per chimpanzee in the federal sanctuary facility operated by Chimp Haven. The average for research facilities becomes $44 per day if the research reserve facility at APF is included. See Table 1 for detailed figures.

Costs for chimpanzees maintenance varies among research facilities based on local economy, size of the facility (some facilities have thousands of monkeys in addition to chimpanzees) and the amount of research conducted. Research facilities also have more extensive hospital and emergency care capabilities and a larger veterinary care staff than sanctuaries.

Table 1 demonstrates how the cost to maintain chimpanzees is affected by their use or non-use in research. The SNPRC has two colonies. The P51 colony is part of a large primate facility that was awarded funds prior to the current ban on new chimpanzee research. The original budget request provided to NIH to cover the costs of chimpanzees over a five-year grant period was based on anticipated savings from program income derived from the use of chimpanzees in research protocols ($22.4/day/animal). More recently, the same facility received another award, U42, to cover the care and maintenance of chimpanzees that were not anticipated to be used in research; the cost is $56.3/day/animal. The quality of care is identical for the two populations but the cost differs because of research use.

The NIRC U42 costs ($28.8/day/animal) are similar to the SNPRC P51 costs because of a similar amount of research use. The K-CCMR costs ($45.5/day/animal) are higher due to less research

than either SNPRC or NIRC and K-CCMR is a smaller facility. The APF costs ($67.4/day/animal) are the highest because research has never been allowed and it is the smallest facility.

Sessions questions:

1) **I have heard from constituents who are genuinely concerned about the humane treatment of chimpanzees in research facilities. My understanding is that the NIH is in the process of reviewing and implementing the recommendations of the Institute of Medicine, is that correct?**

   Answer: We are in the process of reviewing the IOM recommendations regarding the use of chimpanzees in research.

   Regarding concerns about humane care, all animals used in federally-funded research are protected by laws, regulations, and policies to ensure the smallest possible number of subjects and the greatest commitment to their welfare. Fulfilling these protections is a collaborative effort between NIH, federally-supported scientific investigators, and research institutions.

   NIH's Office of Laboratory Animal Welfare (OLAW) provides oversight of all NIH-supported research activities that involve animals. OLAW monitors NIH-funded institutions to ensure their compliance with animal welfare laws and policies. OLAW also investigates allegations concerning animal welfare and appropriate animal care in NIH-funded studies.

   Federally-supported scientists are accountable for the protection of research animals' welfare from the earliest stages of planning until the project's completion. Before beginning the research, scientists must provide thorough, written justification for animal use, as well as a meticulous description of how animals will be housed and cared for and how veterinary care will be provided.

   The NIH peer review system rigorously evaluates these descriptions. Peer reviewers are scientists from institutions around the world who understand scientific value of a particular animal model for understanding the biological processes of a health condition and its treatments. Their evaluations ensure that only the highest quality research projects are considered by NIH for funding.

   A committee at each institution called the Institutional Animal Care and Use Committee (IACUC) also evaluates the proposed research. Comprised of local scientists, nonscientists, community members, and veterinarians, IACUCs closely monitor the research and ensure that the research conducted is in accordance with all provisions of the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals. The NIH will not fund research that uses animals if the IACUC has not given its approval to the proposed study.

   Throughout the research process, the IACUC monitors the care and use of animals at the institution, and it has the authority to suspend any activities involving animals if the research is not in compliance with federal requirements. NIH-funded institutions must report promptly to OLAW if the IACUC finds any violation of the PHS Policy on Humane Care and Use of Laboratory Animals. OLAW then considers these reports and requires the institution to make appropriate corrections and to prevent further violations.

Working together with the research institutions it funds, NIH upholds its commitment to the safety and welfare of laboratory animals so that researchers may continue to understand the biological processes of health and disease and to develop treatments that improve quality of life for both people and animals.

2) **Do you believe that Congress, before enacting a bill like S. 810 (Great Apes Protection Act), should allow the experts at the NIH to finish their task of reviewing the Institute of Medicine recommendation?**

Answer: We believe we should complete our plan to review and implement the IOM recommendations and provide Congress with this information.

3) **How much does the federal government spend annually on keeping chimpanzees at the NIH facilities? Would S. 810 result in cost savings to the federal government?**

Answer: HHS is reviewing S. 810. Below is a summary of current costs, which vary depending on a number of factors.

The cost to provide appropriate facilities and care to the former National Center for Research Resources (NCRR)* owned and supported chimpanzee population is approximately $45 per day per chimpanzee. This figure includes chimpanzees in active research, research reserve, and retired. See the following webpage for more information about costs for caring for and housing chimpanzees:
http://grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees_20110609.htm

The cost to support the NIH Division of Veterinary Resources-owned chimpanzees (18 as of Dec. 15, 2011) located at the Keeling Center for Comparative Medicine and Research, Bastrop, Texas, is $74 per day per chimpanzee. The new contract anticipated to go into effect in August 2012 will have a cost of approximately $50 per day per chimpanzee.

From September 2002 to September 2011, NIAID had a contract with the New Iberia Research Center (NIRC) that covered the leasing of chimpanzees from the NIRC-owned colony for use in research studies on hepatitis C and other important infectious diseases. NIAID spent $6,757,000 on this contract over its lifetime. This figure includes costs beyond care and maintenance, such as special research requirements.

There are two types of costs associated with the long-term care of chimpanzees owned by the NIH: appropriate facility construction and chimpanzee care and welfare costs.

Facility Construction Costs
Chimpanzee facilities are uniquely designed for these large animals, including indoor housing with air conditioning/heating, special wall furniture, etc., and outdoor housing tailored to chimpanzee size and behavior. In 2002-2004 NIH spent approximately $11.8 million to construct a federal sanctuary facility operated by Chimp Haven, Inc. to appropriately house 130 federally-owned chimpanzees over their life-time. In today's economy at the same location the anticipated construction cost would be $125K per animal.

Chimpanzee Care and Welfare

Based on the most recent posting of awards and payments for maintaining chimpanzee care and welfare (http://grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm), NIH is spending an average of $35 per day per chimpanzee in research facilities; $67.00 per day per animal for chimpanzee in the research reserve facility at Alamogordo Primate Facility (APF); and $47 per day per chimpanzee in the federal sanctuary facility operated by Chimp Haven. The average for research facilities becomes $44 per day if the research reserve facility at APF is included. See Table 1 for detailed figures.

Costs for chimpanzees maintenance varies among research facilities based on local economy, size of the facility (some facilities have thousands of monkeys in addition to chimpanzees) and the amount of research conducted. Research facilities also have more extensive hospital and emergency care capabilities and a larger veterinary care staff than sanctuaries.

Table 1 demonstrates how the cost to maintain chimpanzees is affected by their use or non-use in research. The SNPRC has two colonies. The P51 colony is part of a large primate facility that was awarded funds prior to the current ban on new chimpanzee research. The original budget request provided to NIH to cover the costs of chimpanzees over a five-year grant period was based on anticipated savings from program income derived from the use of chimpanzees in research protocols ($22.4/day/animal). More recently, the same facility received another award, U42, to cover the care and maintenance of chimpanzees that were not anticipated to be used in research; the cost is $56.3/day/animal. The quality of care is identical for the two populations but the cost differs because of research use.

The NIRC U42 costs ($28.8/day/animal) are similar to the SNPRC P51 costs because of a similar amount of research use. The K-CCMR costs ($45.5/day/animal) are higher due to less research than either SNPRC or NIRC and K-CCMR is a smaller facility. The APF costs ($67.4/day/animal) are the highest because research has never been allowed and it is the smallest facility.

In summary, the increased cost to the taxpayer to retire animals would derive from construction costs and an increased per diem costs.

4) In your opinion, is it in the national interest to ban chimpanzee research at this time?

Answer: In my professional scientific opinion, I concur with the IOM, which notes that limited research meeting specific criteria may be warranted now and in the future. Also, as indicated by the IOM, the use of chimpanzees is already decreasing. This decreased use of chimpanzees is a natural progression of science; as scientists learn more from the use of animal models, the need for their use decreases and as technology advances more alternatives to animal use are developed

5) Is it possible that a severe pandemic or other public health crisis could occur that would justify the continued use of chimpanzees for medical research?

Answer: The answer to this question is perhaps best highlighted by the thoughts of the IOM panel, a collection of world class scientists who considered this question for many months. The following is a direct quote from the IOM report, page 64:

"As highlighted throughout this report, over many years scientific advances that have led directly to the development of preventive and therapeutic products for life-threatening or debilitating diseases and disorders have been dependent on scientific knowledge obtained through experiments using the chimpanzee. In addition, many preliminary proof-of-concept experiments have been carried out in the chimpanzee; for example, development of human and humanized monoclonal antibody therapies have required preclinical testing in the chimpanzee (Iwarson et al., 1985). The same has been the case for early evaluation of therapeutic concepts based on RNAi, microRNA, and antisense RNA (e.g., for treating chronic HCV infection), and for evaluation of TLR7 antagonists (e.g., for treating chronic HBV infection) (Lanford et al., 2011).

The National Institute of Allergy and Infectious Diseases at the NIH has identified eight instances over the past two decades where research on new (or newly recognized), emerging, and reemerging infectious diseases has called for use of the chimpanzee to answer crucial questions pertaining to pathogenesis, prevention, control, or therapy. In five of these, the chimpanzee is still being used. At the same time, as has been the case rather often in the past, an important new, emerging, or reemerging disease may present treatment, prevention, and/or control problems that defy available alternative experimental approaches, including the most novel, innovative approaches, and therefore may require use of the chimpanzee—rare as this may be, this possibility cannot be discounted over the long term. The committee recognizes that the limited number of available animals and the potential need to perform experiments under conditions of biocontainment could potentially constrain the value of the chimpanzee during a public health emergency. The similarity in the neuroanatomy between the human and the chimpanzee may make it a model for neuropsychiatric disorders, for example, expressing human risk genes via viral vectors or from optogenetic methods that exploit the chimpanzee functional neuroanotomy."

6) **Does S. 810 contain provisions that would allow sufficient flexibility to use chimpanzees for research under appropriate circumstances?**

Answer: S. 810 is currently under review. However, we note S. 810 does not allow for invasive research on chimpanzees under any circumstance, as it prohibits all invasive research on great apes and requires the retirement of all federally owned great apes.

Senator CARDIN. Again, thanks to both of you for your presence and your testimony.

Mr. Ashe, let me start with you if I might. You commented about the bills that are basically under the jurisdiction of your agency, the U.S. Fish and Wildlife Service. There are seven bills here that generally come under your jurisdiction. Could you tell us specifically whether you have a position in support of this legislation, these bills, or whether there are any suggested changes that you would like to see us consider as we look over the seven bills that would generally come under Fish and Wildlife?

Mr. ASHE. Mr. Chairman, my written testimony goes through each bill one by one. I would say that we either support, or support the intention of, each of the bills today. We have indicated in a couple of instances things where we might like to see some changes or expansion in the direction of the bills. And so, we are happy to work with the Subcommittee on each and every one of those bills. We would like to, I think we would enjoin to see enactment of all of them, and we look forward to working with the Committee as you go forward.

Senator CARDIN. And your full statement will be, both of your full statements, will be included in our record.

I think that is very helpful. It is very positive. I know that Senator Lautenberg has worked very hard on the, dealing with the concerns of the wildlife disease emergencies, and it is well beyond just the problems with the white-nose syndrome for bats. There are other areas of equal concern. And the white-nose syndrome is far beyond just one State. There are many States that are involved in it.

Do you see that bill as an opportunity for us to better coordinate responses to these types of emergencies?

Mr. ASHE. We do. And the issue of wildlife disease, as I said, is one of the great emerging challenges for wildlife conservation. Of course, it always has been an issue. For instance, avian botulism has always been an issue that the Fish and Wildlife Service has had to deal with. But now we are seeing these exotic diseases.

Again, the root of many of them is trade and our really kind of weak authorities to regulate the movement of animals in international trade. And so, Senator Lautenberg's bill is certainly a great step in the right direction to encourage and support a better coordination in terms of a response to disease emergencies.

I think we also need to think about how we can prevent these exotic diseases from getting into our wildlife populations in the first place. And that is an area that we would like to work with the Committee to consider how we might envision more effective mechanisms of preventing these disease outbreaks before they occur.

Senator CARDIN. Thank you.

I point out that conservation programs, they are very, very efficient programs in getting dollars out to deal with conservation. The duck stamp, I think it is 98 cents of every dollar goes directly out to acquisition of acreage which is under protection, like 5 million acres have been protected under the Duck Stamp Program.

So, I think it is important for us to try to modernize those programs and make them even more effective. And I appreciate Sen-

ator Begich's comments about it. Does your written statement deal with the waiver suggestion that he has made?

Mr. ASHE. It does. We are strongly supportive of Senator Begich's bill. Of course, the last time the price of the stamp was adjusted was 1991. So we have lost purchasing power. The price of the stamp today, our estimate is that it would have to be $24 to have the same purchasing power as in 1991.

So increasing the price of stamps, which is supported by all of the major waterfowling organizations and hunting organizations like Ducks Unlimited and Delta Waterfowl and others, but then the exemption process that the Senator envisions will allow us to deal with some of the basic injustice and equity issues like he mentioned with Alaska natives, where we have Alaska natives that are engaging in a subsistence hunt, not a sport hunt, and they, as the Senator said, they conserve millions upon millions of acres of wetlands.

And so, we believe that there is an appropriate balance that can be made in instance like that where an exemption would not affect the revenue substantially or our ability to more broadly enforce the purchase and carry requirements for the duck stamp.

Senator CARDIN. Thank you very much.

I can also mention the National Fish and Wildlife Foundation since it has funded, I have been told, over 400 Maryland projects since 2000, is a very important program for us to reauthorize.

I also have questions in regard to Dr. Anderson and the chimpanzees, but my time in the first round has expired, and I guess that some of my colleagues will be questioning on subjects that I may have questioned anyway, so let me turn it over to Senator Inhofe.

Senator INHOFE. OK. Thank you, Mr. Chairman.

Director Ashe, I really do appreciate your coming out and talking to our constituents and also your recognition of what happened in Woodward, Oklahoma. It was just really tragic. I knew one of the persons who died in that tornado. So I will pass that on, your concern and your condolences at the same time.

As you know, this issue is really important to the people of Oklahoma along with the people of the other four States making a very significant push to ensure the long-term viability of this species. That said, I know that the proposed listing deadline is coming up in September, and the settlement agreements allow the Service to grant a 6-month extension so biologists can continue examining this species.

I do not want to ask you for a commitment. I just ask if you would be as flexible as possible to working with my office and other stakeholders to allow time for these efforts to demonstrate what they are able to do.

Mr. ASHE. We will work with you, Senator. The law does provide us with some flexibility to take into account new information. And the State of Oklahoma, as you know, has been a leader. I met last week again with Secretary Gary Shearer, and the State is really producing a great plan for conservation of the lesser prairie-chicken and is leading the other four States within the range of the species. So we look forward to working with the State of Oklahoma and the

other range States and we will provide as much flexibility as we possibly can.

Senator INHOFE. That is great. And I appreciate that. That is all I could ask.

Could you just make some comments about the reauthorization of the North American Wetlands Conservation Act, and more specifically, why it is important to have a voluntary program like that that offers the—that incentivizes the State and private funding? Your comments about the NAWCA.

Mr. ASHE. Sure. First, I want to begin with thanking you for your leadership in introducing that legislation. The North American Wetlands Conservation Act has been an absolute—has become an absolute foundation of our ability to conserve the waterfowl resource in the United States. It provides a bridge between Canada and the U.S. and Mexico, coordinates response amongst all of the agencies within the three governments. So, in the United States, it is Interior, it is Agriculture, the Department of Defense. We have partners like The Nature Conservancy, Ducks Unlimited, Trust for Public Lands. All of our State agencies are partners in that process.

So the North American Waterfowl Conservation Act has really become a singular success leveraging public dollars, 2 and 3 and 4 to 1. At the Migratory Bird Conservation Commission meeting last month they presented a slate of projects that were matched with three private dollars for every Federal dollar. So, just a tremendous success story, and the bill needs to be reauthorized so that we can continue that record.

Senator INHOFE. OK. I appreciate that very much.

Dr. Anderson, we had a hearing, it was not too long ago, I remember Senator Lautenberg and I were very interested in that. It was about some of the extreme animal rights groups coming in and trying to stop all experiments. I remember my son calling me, he is a medical doctor, saying well, Dad, do they not understand the choice may be animals or people? So, I know that this is something that we have to deal with.

In that case, however, there are specific things that we are able to achieve and demonstrate having been done. Do you want to make any comments about some of the really, not any specific extremist groups, but this idea that they should do away with all that type of experimental activity put together?

Dr. ANDERSON. Well, I would like to point out that the chimpanzee model being close to humans has been invaluable in the past. It has provided us with the oral Sabin vaccine. I just remembered the number. In 1952 there were 52,000 cases of polio. It is eradicated in the United States now. And there are similar dramatic improvements because of vaccines for hepatitis A and B.

Senator INHOFE. Now, I am old enough to remember. Do you really think that would not have happened if we had not had the opportunity to use chimpanzees? Was that a major player in this success?

Dr. ANDERSON. These were major.

Senator INHOFE. Yes. Yes.

Dr. ANDERSON. But that said, the Institute of Medicine, we have accepted their recommendations that there be criteria, really a

high bar for using chimpanzees in the future. Part of this is because we have developed other models. There is a humanized mouse now that can be infected with hepatitis C. It is not perfect. We are not quite there in replacing all uses of chimpanzees.

But the IOM pointed out that there were appropriate uses currently, I think most importantly, if we were to consider not having the model available, is, they pointed out, that there will be new and emerging, unexpected infectious diseases for which this model will be appropriate. And in the last few decades we have had examples of viral and bacterial infections where the chimpanzee has been the best model.

Senator INHOFE. Now, on the chimpanzee, you would not support a total, outright ban on all experiments on the chimpanzee?

Dr. ANDERSON. That is correct. NIH has accepted those recommendations from the IOM that this continue as an available model, but that there be high criteria for when we use it.

Senator INHOFE. Sure, sure.

Thank you, Mr. Chairman.

Senator CARDIN. Senator Lautenberg.

Senator LAUTENBERG. Thanks, Mr. Chairman.

Mr. Ashe, thank you both for your important testimony here.

Over the past several years, Congress has appropriated $5 million in funding to fight the white-nose syndrome. We are now fighting for more resources to conduct our campaign. What progress so far has Fish and Wildlife made toward addressing the disease? Are we making any progress?

Mr. ASHE. I think we are making tremendous progress, Senator. Of course, funding has been essential to that progress. I think we are understanding more about the disease. I mean, you mentioned 19 States. We have an extensive monitoring framework now that is done cooperatively with our State and other Federal partners. We have put in place protocols for cave—for consideration of cave closures, and cave resource management. We are and have worked on rapid response plans. So I think we have, we have made tremendous strides in our understanding of the disease.

Of course, what eludes us still is how to prevent further spread of the disease and really even fully understanding the vectors through which the disease is moving across and between the States. And so, we need more support. We need more research. We need improved partnership in the future between Federal, State, and private parties if we are going to attack the problem. But it is extremely complex.

Senator LAUTENBERG. Well, we have marshaled a lot of resources, not just the funds but organizationally. And we know that in Europe there is a different version of the white-nose syndrome. I do not know what we are learning from them, but I assume that we are swapping information freely?

Mr. ASHE. We are working with Europe. Of course, the fungus, the same fungus essentially in Europe does not cause the mortality in bats that we see in the United States. And so, there is always hope that bats here, that we will see an adaptation. There has been some indication that there may be some adaptation occurring, but it is way too early to tell whether that will be widespread.

But what we need is to better understand how the fungus is moving, how it is affecting bats at the population scale, what kind of management can we undertake to mitigate the effects on bat populations.

Senator LAUTENBERG. All of the questions that you just posed are very good, and we look to you for the answers.

Mr. ASHE. Thank you, sir.

Senator LAUTENBERG. The white-nose syndrome killed upwards of 5 million bats and continues to spread across the country. Now, earlier this year, the disease was confirmed west of the Mississippi, raising the risk for some of our largest agricultural States. What impact might the decimation of the bat population have on agriculture?

Mr. ASHE. We speak a lot these days in the conservation world of ecosystem services, essentially the free service that healthy and vibrant ecosystems provide. We know they provide flood control. They provide air quality and water quality benefits. The bats, they provide a huge benefit to the agricultural industry in terms of elimination of pests, insect pests. And so some of the estimates are $20 billion to $25 billion in ecosystem services that are provided by bat populations to the agricultural industry.

So, the decline, a potential decline or devastation in bat populations is of tremendous consequence to the American people, not just in the economic effect but then, in order to replace that service, we have to use pesticides. So there would the corresponding increase in our reliance upon pesticides with the corresponding potential and wildlife effects.

Senator LAUTENBERG. And obviously price increases would like follow, as the crops are produced in less quality.

Dr. Anderson, I have introduced legislation to reform our country's broken chemical safety law. We talk about TSCA, in particular. Included in my Safe Chemicals Act is a provision to reduce animal-based testing and promote research into advanced toxicity testing techniques. How far along are we—we have talked about this fairly extensively already—in developing tests that provide scientifically valid data without using animals at all?

Dr. ANDERSON. We are not quite there yet. The thing that is on the horizon now is the use of small, isolated units of biology, or a few cells that mimic something about the body that we can interrogate with toxins or with pharmaceuticals. We have several examples of that at NIH that we have recently developed. One is a big program with DARPA and FDA in regulatory science, or how do we collect the data to review drugs appropriately and safely move them along and hopefully faster. We have a way to go, but are working very hard in this area.

Senator LAUTENBERG. Thanks, Mr. Chairman. I have additional questions I will submit for the record.

Senator CARDIN. That is perfectly acceptable.

Senator Udall.

Senator TOM UDALL. Thank you, Chairman Cardin.

Thank you both for your testimony. Director Ashe, in particular I appreciate your testimony on the population impact on our natural resources. I am glad that is something that you are concerned about, and also your concerns for diversity.

We have, Dr. Ashe, a very important decision, as you know, the upcoming listing decision of the dunes sagebrush lizard, an extremely important issue in southeastern New Mexico. New Mexico ranchers, oil and gas producers, the State Land Office, and BLM have entered into conservation agreements covering 90 percent of the lizards' habitat in New Mexico.

Last week, Senator Bingaman and I sent you and Regional Director Tuggle a letter commending the work on these agreements. We encourage the Fish and Wildlife Service to finalize similar agreements in Texas. What do these conservation agreements mean for ranchers or oil and gas producers who have signed them?

Mr. ASHE. I think that what we see emerging in New Mexico and hopefully expanding into western Texas is really a model of how we can approach endangered species conservation in the future. And those candidate conservation agreements and candidate conservation agreements with assurances, in particular, what they represent to those landowners is essentially insurance that if a listing does occur, that what they are doing, those best management practices that they are implementing, will be enough. That is all they will be held to.

So, in the best case, they can help us avoid a listing because by implementing those best management practices they are abating the threat to the species. And so, we are hopeful that we may be able to avoid the necessity to list if we get similar commitments in Texas. But even if we have to list, they have that assurance that those practices that they have committed to are all that they will be held to in the event of a listing.

Senator TOM UDALL. And from a scientific perspective, how valuable are these agreements to protect the species?

Mr. ASHE. Well, they attack the cause. The threat to the species is the loss and fragmentation of its habitat. And so, the foundation of those agreements is avoidance of the shinnery oak habitat that is key for the dunes sagebrush lizard, avoidance, minimization of damage and then mitigation of any damage that does occur. So, it is essential to dealing with the threat to the species.

Senator TOM UDALL. And from a legal perspective, how significant are these agreements under the Endangered Species Act?

Mr. ASHE. Well, as I said, they provide the key if we are doing to avoid the necessity for a listing because we have to show that the threat to the species has been abated. And so, from a legal standpoint they would provide the underpinning that is necessary if we are going to reach a not warranted conclusion.

Senator TOM UDALL. As you are aware, Director Ashe, the Center for Excellence for Hazardous Materials Management in Carlsbad is a respected and independent third party non-profit organization responsible for holding the lizard permit as part of these conservation agreements. Can you explain the role of the Center for Excellence in Carlsbad and how valuable they have been in this process?

Mr. ASHE. We have to—when we form a candidate conservation agreement, we have to have somebody to hold a permit, and in this case we have had a third party step up in New Mexico to be the holder of that permit. Then they will be the party that we go to to ensure terms are being adhered to and that we can show that

the conservation that is supposed to occur is actually occurring. We have seen, thus far, an excellent track record in New Mexico, so reason for optimism.

Senator TOM UDALL. And their job is to go out on the ground and make sure that the conservation is actually occurring?

Mr. ASHE. Occurring, correct.

Senator TOM UDALL. The third party permit holder. Have we ever seen conservation agreements on the scale that New Mexico has done for the lizard? And if they are successful, could they be a model to protect future species?

Mr. ASHE. I am not aware of any application where we have seen candidate conservation agreements at this scale. We have now 2 million to 2.5 million acres of land in eastern New Mexico covered under candidate agreements that will help us conserve both the lizard and the lesser prairie-chicken. And this really is, I think, an emerging model for endangered species for candidate conservation where we get ahead of a listing decision, we put conservation on the ground, we are working with private landowners.

And I would have to give a bit of shout out to the Bureau of Land Management in this case in eastern New Mexico. The Bureau of Land Management has been an exceptional partner in this endeavor. And you are also considering here today the reauthorization of the National Fish and Wildlife Foundation. The Foundation has been a grantee in this case and has been a key partner in making this success story happen.

Senator TOM UDALL. Thank you.

Chairman Cardin, I just have one additional question for Dr. Anderson, and then I would submit the rest of my questions for the record.

Dr. Anderson, in Alamogordo, New Mexico, there is a primate facility housing approximately 200 chimpanzees formerly used in research. This group of chimpanzees has been described extensively by scientists and in the media as sick, aged, infected, diseased, maimed, and scarred. Many scientists have suggested this group, in particular, is completely inappropriate for invasive testing.

Members of Congress, members of the New Mexico legislature, and the city of Alamogordo have expressed concerns to the National Institutes of Health over further invasive testing on this group of chimps. As you know, the vast majority of these chimpanzees have not been used in invasive studies since 2001.

It is my understanding that all the Alamogordo chimpanzees were exposed to hepatitis C and HIV during their years in research, and most of the population is affected with multiple, chronic conditions. Does preexisting exposure to hepatitis C and HIV limit the usefulness of chimpanzees in future research? And are there areas of research where this specific Alamogordo population with their ongoing conditions could still be used in light of the IOM study?

Dr. ANDERSON. Well, first, let me reassure you that there is no research at the Alamogordo facility, and we have charged the working group with making recommendations on the size and the placement of future populations, the size of a group of animals that would be needed for research, and the Alamogordo population will fall within their considerations.

Senator TOM UDALL. Thank you. Thank you very much.

And Chairman Cardin, thank you for your courtesy in letting me go over a little bit there.

Senator CARDIN. Let me now recognize Senator Carper and thank him for his leadership on the Delaware River Basin Conservation Act, S. 1266. Before Senator Carper begins, let me point out that we have only heard very positive things about this legislation.

Senator CARPER. Could that possibly be my bill?

[Laughter.]

Senator CARPER. Well, who said them? Who said those positive things?

Was that you, Mr. Ashe?

Mr. ASHE. I think I did.

Senator CARPER. OK, good. Well thank you. Thanks very much.

Thank you both very much for joining us. I am sorry I missed your testimony. My colleagues and I, we usually have several different hearings going on at once, and I have been trying to combat waste and fraud in Medicare and Medicaid downstairs for the last hour or two. Now, we are going to come up and try to do good things with clean water in a bunch of places, including the estuary that we call the Delaware River Estuary.

It is a big one. And we have noted, with some pleasure, the river that divides our two States, the water quality is getting better. We continue to work on it because everything we do we know we could do better.

Let me just ask, if I can, I have a statement I would like to enter for the record, Mr. Chairman, please.

Senator CARDIN. Without objection, your entire statement will be made a part of the record.

Senator CARPER. Thank you. Thank you.

Mr. Ashe, based on your expertise as Director of the Fish and Wildlife Service, could you just expand for us on the importance for us that you mentioned in your testimony of protecting the Delaware Basin Watershed? What are some of the risks, ecological risks, economic risks, and other risks that could come to bear if we do not invest in protecting the Delaware River?

I think when you look at how much money we invest, the Federal dollars that we invest in protecting the Delaware River Estuary, I think it is pretty modest by Federal standards, by like $1 million. Can you compare that with some others? Maybe you can give us an idea of what we are spending in some areas of the country if that is a modest investment. I think it is. I would be interested in knowing what the cost-benefit ratio is but it has got to be pretty good because the investment is so modest.

Could you just, if you will, go back to the importance that you mentioned in your testimony of protecting the Delaware River Basin and also just share with us some of the risks? Thank you.

Mr. ASHE. The Delaware River and the Delaware Bay Estuary are—provide a tremendous natural resource for the country. And when you think about the two sides, of course, even in the Fish and Wildlife Service we have the Cape May National Wildlife Refuge on the New Jersey side, we have Prime Hook and Bombay Hook on the Delaware side, we have a tremendous interest in resources like

the red knot, a migratory species that goes from South America to the Arctic to nest. Delaware Bay is a key resting and foraging place for the red knot.

Senator CARPER. We like to say it is the place they like to stop for lunch.

Mr. ASHE. Exactly.

Senator CARPER. Sometimes breakfast, too.

Mr. ASHE. So it is just a key strategic resource from the standpoint of fisheries and wildlife management along the Eastern Seaboard. And you mentioned the cost-benefit ratio. I think what you are trying to do is preventative care, put the investment into the resource before we have a crisis. We can see places like the Everglades, where we are spending billions of taxpayer dollars, and the San Francisco Bay Delta, again billions of taxpayer dollars to restore ecological systems that have collapsed as a result of misguided management in the past. Se, we applaud your effort to really do preventative management and lead that effort.

What we would like to do is work with you to see if we can put this into the context of some of the larger efforts that we are looking at along the north Atlantic, the North American Wetlands Conservation Act and some of the larger landscape issues that we are working on and are represented in the legislation before the Committee today.

Senator CARPER. Let me just ask a question about how do we measure progress. One of my favorite questions of people when they are presenting with us ideas to spend Federal dollars is what do you want to accomplish, and how would you go about measuring progress. Could you just sort of work off of that question with respect to an estuary like the Delaware River Basin Watershed?

Mr. ASHE. Measuring progress in our field is, of course, a great challenge. One of the things that we are working on in the U.S. Fish and Wildlife Service is can we use, can we find biological metrics that tell us something about ecosystem health on a larger scale? And so, we would like to look at areas like the middle Atlantic, the Delaware River Estuary, and say, can we establish biological markers that tell us something about the larger ecosystem function?

So, we might look at things like the red knot. What is, is that population a good indicator of aspects of ecological health within the Delaware River Basin? Things that we can readily measure but that also tell us something about larger ecological function.

Senator CARPER. OK. If I could, last week Senator Lautenberg and I were sitting here and we were having a hearing on mercury, the emission of mercury and what it does when it gets into the water and fish, birds and waterfowl, and what is done with pregnant women, childbearing women and the children they bear in too many cases.

And right there, sitting in your seat, was a witness from Michigan, the northern part of Michigan, and she is an outdoorswoman of some renown, and she is lovingly referred to in northern Michigan as the Sturgeon General.

[Laughter.]

Senator CARPER. The Sturgeon General. So, when she testified, Senator Lautenberg, I called her General during the course of her testimony.

[Laughter.]

Senator CARPER. She was actually quite a good witness.

But when you look to sturgeon population in the Delaware River, I think is coming back a little bit. I just kind of—is this one of the markers that we look at to see if we are making some progress? I think we are.

The last thing I would say is we have gone through, as Senator Lautenberg knows, a lot of discussion between Delaware, Pennsylvania, New Jersey, and others, environmental community reports up and down the river, on whether or not we can safely dredge the Delaware River Bay to a depth of 45 feet in order to make sure that our ports remain vibrant and relevant. And after a lot of research and thinking and talking and all, we finally decided that yes, we can do that.

There is a big question, one of the questions we wrestle with here is, is it possible to have economic growth and job creation and still protect the environment? And we think in this case that we can, and we are going to go forward in a very guarded, measured way to make sure that our ports continue to be vibrant, active, and relevant but at the same time we do not despoil the water, reverse the quality that we have made in cleaning up the Delaware River.

Mr. Chairman, I think it is great that you had this hearing. We really appreciate your giving us a chance to talk a little bit about the legislation some of us have introduced. So, thank you so much.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE

I would like to thank Chairman Cardin for scheduling this legislative hearing today to consider a number of important items, including S. 1266, the Delaware River Basin Conservation Act. The Delaware River Basin Conservation Act is co-sponsored by members of this Committee, including Senators Lautenberg and Gillibrand, and Senators Coons, Casey, Menendez, and Schumer. There is also a House version of the Delaware River Basin Conservation Act, which was introduced last June as well, and is co-sponsored by several Republican and Democrat Members of Congress.

Despite being a major economic, environmental, and recreational asset, the Delaware River Basin watershed region does not have a Federal program charged with leading conservation and restoration efforts in the region. The Delaware River Basin is home to more than 8 million people, and more than 15 million people depend on it as a source of drinking water, including the populations of the first and fifth largest cities in our country, New York and Philadelphia. It is estimated that the Delaware River Basin contributes more than $10 billion annually to the economy, supporting critical economic activity in the port, shipping, agriculture, fishing, tourism, food and beverage, and other industries. Given the tremendous value of the Delaware River Basin, it makes a lot of sense to me that we would take the necessary steps to safeguard this important resource so that it can continue to provide this great value to our economy, environment, and our communities for generations to come.

S. 1266 would establish the Delaware River Basin Restoration Program within the Fish and Wildlife Service. This program would be charged with creating a single, basin-wide strategy to guide conservation and restoration efforts in the Delaware River watershed region. The program would support on-the-ground conservation and restoration projects in the Delaware River region. These projects would create real jobs—jobs that not only add economic value but also improve the quality of our environment, resulting in a double return on our investment.

S. 1266 was passed out of the Environment and Public Works Committee in December of last year. Prior to that, my office worked closely with several stakeholders that operate in the Delaware River watershed region, and with the U.S. Fish and Wildlife Service, to make improvements to the bill, which were successfully included in the bill that was passed out of this Committee last December. I greatly appreciate today's legislative hearing as an opportunity to hear further feedback on S. 1266 and will take the comments offered by our witnesses today to heart as we continue to move this important piece of legislation forward.

Thank you.

Senator CARDIN. Senator Carper, we thank you for your strong national leadership on great water bodies, including the Delaware River Basin. It is the way that I think we can really get a handle on preserving our biodiversity and our environment, and we also pointed out, our economy. It is very important. We appreciate your leadership.

Dr. Anderson, before I do that, Mr. Ashe, I want to just compliment you on the response with Senator Udall as it relates to the Endangered Species Act. We are in total agreement that these candidates for conservation agreements are the way to proceed for the two reasons that you mentioned. First, they avoid a listing when we have management plans that are reversing the trends that have already taken place. And second, in the event that there is a listing, it also provides safe harbors for those who have made the proper investments. So, I thank you for that.

And thank you for the leadership in New Mexico, Senator Udall. I think what you are doing is the right thing as it relates to the lizard, and we hope that we will be able to proceed in western Texas so that this will be an issue that will be handled in the spirit of why we have the Endangered Species Act. So we wish you well on that.

Senator TOM UDALL. Thank you.

Senator CARDIN. Dr. Anderson, I want to turn to the chimpanzees for one moment. I very much appreciate your testimony and the acceptance of the Institute of Medicine's recommendations. But you point out that it is going to take a little bit of time for you all to figure out exactly how to handle this as it relates to your current population of chimpanzees.

I think the Cantwell bill envisions—well, it would not envision, it mandates that the experimentation end. It also points out that many of the chimpanzees would be sent to sanctuaries and envisions a savings of several tens of millions of dollars for taxpayers.

My question to you is, or request, is that I would ask the National Institutes of Health to give us some direction. If Congress is to pass legislation, how you would want that legislation drafted?

I do not want to make any assumptions. But the legislation, as currently drafted, if it were enacted into law, would prevent the further experimentation on chimpanzees. I understand from your testimony that is not the position of the National Institutes of Health at this particular moment.

So I would ask that you focus on what would be the proper congressional response to help the implementation of the Institute of Medicine's recommendations which may be, or may not be, what the Congress wants to do. But I think it is a good starting point and probably does represent the best consensus that we might be able to get in Congress.

Dr. ANDERSON. Thank you, Senator. We will do that. We will do that in writing.

Senator CARDIN. That would be, I think, helpful for us in our work. And also as it would relate to what your intentions are to do with the chimpanzees that are no longer going to be candidates for use and how you would recommend we handle that transition.

Dr. ANDERSON. I would like to point out that we have asked for recommendations from the working group specifically on these issues. So, I would not want to preempt their conclusions. But they are asked to address those issues.

Senator CARDIN. That would be helpful if you get first their recommendations to you and then second your response. So far as I understand it, you are accepting the Institute of Medicine's recommendations.

Dr. ANDERSON. Completely. Yes, sir.

Senator CARDIN. And if that continues, we need to know that because they give you additional information. My expectation is that you will follow their recommendations, and then we will need a game plan as to how you intend to implement that and how the Congress could be helpful so that these policies become institutionalized within the Government, not just from one Administration, but have a little bit more staying power.

Dr. ANDERSON. Thank you, Senator, we will.

Senator CARDIN. And then the last point that was raised as to how it relates to animal experimentation beyond just chimpanzees. It would be interesting to keep us informed on that so that we can try to be a positive partner with the National Institutes of Health.

Dr. ANDERSON. Thank you. We will.

Senator CARDIN. Thank you.

Again, let me thank both of our witnesses for their testimony. We will now turn to the second panel.

Let me welcome Dr. Doug Inkley, Senior Wildlife Biologist for the National Wildlife Federation. Dr. Inkley is a certified wildlife biologist with expertise in ecology and wildlife management and is the National Wildlife Federation's Senior Scientist.

Let me also welcome Dr. Martin Wasserman, former Secretary of the Maryland Department of Health and Mental Hygiene, former Administrator of the Oregon Public Health Department. Dr. Wasserman is a pediatrician, a lawyer, and has served as the Executive Director of the Maryland State Medical Society, a Maryland constituent and a friend. So it is good to have Dr. Wasserman here. We have worked together on many issues from public health to policies affecting broader issues in our State. It is a pleasure to have you before our Committee.

And Dr. Greg Schildwachter. Dr. Schildwachter is a professional conservationist with 25 years of experience in policy, science, and management of land, water, fish, and wildlife. He holds a degree in Wildlife Biology from the Boone and Crockett Wildlife Conservation Program at the University of Montana, as well as degrees from the University of Tennessee and the University of Georgia.

It is a pleasure to have all three of you with us. We will start with Dr. Inkley.

STATEMENT OF DOUGLAS B. INKLEY, PH.D., SENIOR SCIENTIST, NATIONAL WILDLIFE FEDERATION

Mr. INKLEY. Good morning, Senator Cardin. As a 30-year resident of the State of Maryland, I have to tell you that I was especially pleased to receive your invitation to testify today.

Senator CARDIN. I do not think I had that on my introduction.

Mr. INKLEY. No, I kept it a secret.

Senator CARDIN. Well, let me add that to my introduction. It is a pleasure to have another Marylander on the panel.

[Laughter.]

Mr. INKLEY. Thank you.

The National Wildlife Federation's 4 million members and supporters include outdoor enthusiasts of all types, hunters and anglers like myself, backyard gardeners, birdwatchers, and many more. So, on their behalf today, and our 48 affiliated States, including the Baltimore Aquarium, one of our affiliates, we greatly appreciate the opportunity to testify for the purpose of protecting wildlife for our children's future. So thank you again.

It is worth noting that four of the bills under discussion today pertain to three long standing laws supported largely by hunters and anglers. It is a testament to their commitment that they support providing the funding for the so-called Duck Stamp Act, the Federal Aid and Wildlife Restoration Act, which you and I know as the Pittman-Robertson, or PR, Act, and matching funds for implementation of the North American Wetlands Conservation Act.

As a hunter, I am especially proud that my fellow sportsmen and women are putting their money where their mouth is, over the history of those programs, some $10 billion just for those three programs alone to conserve some 35 million acres.

In the interest of brevity, I ask that my entire written testimony be submitted for the record.

Senator CARDIN. All of your statements, all three of the witnesses, your full statements will be included in the record.

Mr. INKLEY. Thank you. I will briefly highlight five of the bills.

The first two bills pertain to the Duck Stamp Act. The National Wildlife Federation has supported this Act ever since our founding in 1936. J.N. Ding Darling, a giant in conservation, helped establish the Duck Stamp Act in 1934 and sketched the first ever duck stamp. It is no small coincidence that Ding Darling was also a founder of the National Wildlife Federation and the artist for our first annual production of conservation stamps. So we feel a particular affinity for that law and are very supportive of it.

The Duck Stamp Act requires all waterfowl hunters to purchase a duck stamp and the revenue furthers the conservation of wetlands and contributed to the addition of more than 6 million acres to the National Wildlife Refuge System. Certainly, a great success.

So the two bills being discussed today, the Permanent Electronic Duck Stamp Act of 2012 and the Migratory Bird Habitat Investment and Enhancement Act, are both intended to strengthen the ability to continue the effectiveness of this program. Without going into the details of those programs, I will simply state that we certainly strongly support both of those and look forward to their being passed and enacted into law.

The third bill to discuss today, and I noticed that Senator Carper was here earlier, is the Delaware River Basin Conservation Act, S. 1266. This Act provides a framework for protecting and restoring the Delaware River Basin. It has more than 200 finfish and shellfish species, and the watershed provides clean drinking water to 7 million people in the city of New York. These benefits, unfortunately, are threatened by changes in land use and the region's long legacy of pollution.

The Act would help to one, restore or protect fish and wildlife species and habitats, and two, improve or protect water quality. So, we support the Delaware River Basin Conservation Act and applaud the Committee and you, Senator Carper, for favorably reporting it in December 2011. Thank you.

The fourth bill is the National Fish and Wildlife Foundation Reauthorization Act which I will refer to as NFWF, which most people do. It facilitates private investments in fish and wildlife conservation in partnership with Federal conservation agencies such as the Fish and Wildlife Service. It is especially important in these economic times, and impressive, that NFWF leverages every Federal dollar with at least 3 private dollars to invest in conservation.

Two great examples of success are efforts to restore the longleaf pine community in the Chesapeake. Both are described in greater detail in my testimony, but I would also note that the National Wildlife Federation and our affiliated organizations are both involved in those conservation efforts. S. 1492 will reauthorize NFWF at its existing authorization level and allow NFWF to continue its remarkable legacy of conservation successes. We urge its passage.

The fifth and last bill that I will make my remarks on, briefly, is the North American Wetlands Conservation Extension Act. This really is a world class model for successful public-private cooperation, achieving on-the-ground wildlife conservation.

Since its inception nearly a quarter century ago, NAWCA has facilitated the conservation of more than 26 million acres across the 50 States of the United States. Because it has such a strong track record in incentivizing significant investment in habitat conservation, we certainly support this program as well.

In conclusion, we appreciate the Committee's efforts to address these important wildlife issues that have been the subject of today's hearing and look forward to working with you to enact them.

And again, thank you very much for having me. As a Maryland resident, we finally meet.

[The prepared statement of Mr. Inkley follows:]

Testimony of Douglas B. Inkley, Ph.D.
Senior Scientist, National Wildlife Federation

United States Senate
Environment and Public Works Committee, Subcommittee on Water and Wildlife
Legislative Hearing

April 24, 2012

Chairman Cardin, Ranking Member Sessions, members of the Subcommittee, thank you for the opportunity to be here today. National Wildlife Federation is a non-partisan, non-profit organization. Our mission is to inspire Americans to protect wildlife for our children's future. National Wildlife Federation is supported by 48 state and territorial affiliates and more than 4 million members and supporters. Our members include hunters, anglers, backyard gardeners, birdwatchers and many other outdoor enthusiasts from throughout the nation.

Wildlife conservation has been the focus of our efforts from inception. Time and again, threats to wildlife have unified diverse people from across our nation to take action in the interest of conserving the nation's rich wildlife heritage. As a result, many important wildlife conservation laws have been passed, such as the Endangered Species Act, the Clean Water Act, the Migratory Bird Treaty Act, the Federal Aid in Wildlife Restoration Act, and the Federal Aid in Fisheries Restoration Act, to name just a few. The remarkable successes of these and other wildlife laws have saved many species from extinction, restored many game fish and wildlife species, and even led to the recovery of the bald eagle, the nation's symbol. We appreciate the opportunity to testify today on several proposed bills regarding wildlife conservation, and the efforts of the Congressional sponsors of these bills, to further advance conservation of our nation's fish and wildlife for the benefit of all citizens.

The Permanent Electronic Duck Stamp Act of 2012 Section (S.2071) and The Migratory Bird Habitat Investment and Enhancement Act (S.2156)

The National Wildlife Federation has supported the Migratory Bird Hunting and Conservation Stamp Act, or "Duck Stamp Act," since our founding in 1936. In fact, J.N. "Ding" Darling not only helped establish the Duck Stamp Act in 1934 and was the artist for the first-ever federal duck stamp, he also was a founder of the National Wildlife Federation and the artist for our first annual production of "conservation stamps."

The Duck Stamp Act is strongly supported by hunters and other conservationists, and requires all waterfowl hunters to purchase a duck stamp. The revenue is used to further conservation of waterfowl and other wildlife and has contributed to the addition of almost six million acres to the National Wildlife Refuge System.

In 2006, the Electronic Duck Stamp Act (S.1496) was passed to authorize a 3-year trial of electronic or so-called "E-stamps" with the intent of facilitating purchase by waterfowl hunters among others. The August 2011 "Federal Duck Stamp Program - Electronic Duck Stamp Pilot

Program Report" prepared by the U.S. Fish and Wildlife Service reveals that electronic sales were tested in eight states and administrative procedures refined over the 3-year trial period, resulting in an operationally-effective program. Furthermore, there was no apparent decrease in sales, and hence revenue for conservation purposes.

In light of the success of the 2006 Electronic Stamp Act pilot program, the National Wildlife Federation now urges enactment of "The Permanent Electronic Duck Stamp Act of 2012" (S.2071). This bill would facilitate electronic sales of the duck stamp while retaining the long tradition of the annual duck stamp contest and collection of duck stamps by hunters and other supporters. We also urge that Congress encourage the U.S. Fish and Wildlife Service to explore and implement ways in which voluntary purchase of duck stamps by other members of the public (beyond the required purchase by waterfowl hunters) can be increased to raise additional revenue for conservation. Electronic sales of duck stamps will make them much more accessible for purchase. A better conservation investment would be hard to buy given that ninety-eight cents out of every dollar from duck stamp sales goes directly to wetlands protection in the National Wildlife Refuge System.

Although the duck stamp program has been extremely successful, changing times have reduced its effectiveness. The price of a duck stamp was $1 in 1934, and was increased seven times by Congress, to its current price of $15, set in 1991. Thus, the duck stamp price has not been raised in 21 years, compared to an historic average of an increase every 8 years. During this 21 years, duck stamps have lost 40% of their value based on the consumer price index, while the average price of wetlands for purchase through this program has more than tripled from $306 per acre to $1091 per acre. Due to the absence of significant increases in the price of duck stamps, coupled with consumer price index growth and the increasing cost of protecting wetlands, the duck stamp program's effectiveness will continue to decline. To maintain its buying power and effectiveness in conserving wetlands, we support appropriate increases in the price of duck stamps. The Migratory Bird Habitat Investment and Enhancement Act (S.2156) provides a mechanism by which the price of the duck stamp can be periodically assessed and raised to continue its effectiveness.

National Fish and Wildlife Foundation Reauthorization Act (S.1494)

The National Fish and Wildlife Foundation (NFWF) has been a remarkable conservation success ever since it was first established by Congress in 1984 for the purpose of facilitating private investments in fish and wildlife conservation in partnership with the U.S. Fish and Wildlife Service. NFWF currently has partnerships with 14 federal agencies and has received funding contributions from thousands of corporations, foundations and other private entities. In these times of tight fiscal constraints, it is noteworthy that NFWF leverages every federal dollar with at least 3 dollars from private sources to fund conservation. In fact, to date, NFWF has leveraged $576 million in federal funds into $2 billion for conservation for non-regulatory, voluntary, on-the-ground fish and wildlife conservation projects that benefit private working lands and local economies in all 50 states.

NFWF's purpose is to achieve conservation success on the ground. It does not and cannot provide grant funds for litigation, advocacy, or lobbying. Its on-the-ground conservation successes are far too many to describe in detail here, but cover a broad range of habitats, fish and wildlife across the country.

Longleaf pine restoration is one example of an on-going program at NFWF that brings together federal agencies and the private sector to address a conservation challenge. NFWF recently expanded this program through two new federal partners that will support accelerated restoration in the longleaf pine ecosystem. Originally covering 90 million acres, this ecosystem is today only three percent of its original size, and is the only home for some threatened and endangered species, such as the red-cockaded woodpecker, the gopher tortoise and the indigo snake. Since 2004, NFWF and the Southern Company have invested over $8.7 million into projects which will restore more than 82,000 acres of longleaf pine forest.

Another outstanding on-going project is the collaboration of the EPA Chesapeake Bay Program and NFWF which recently announced over $10.9 million in grants for 55 environmental projects in the Chesapeake Bay Watershed's six states and the District of Columbia. The projects will preserve 3,729 acres of land, restore 32 miles of riparian areas and stream banks and implement the best stormwater management practices on 2,878 acres.

The bill will reauthorize NFWF at its existing authorization level and, among other things, will strengthen its ability to work with federal agencies more effectively, reduce bureaucratic burdens, and maximize conservation outcomes. NWF supports the bi-partisan "National Fish and Wildlife Foundation Reauthorization Act" (S.1494) to build further on NFWF's remarkable legacy of conservation success.

Target Practice and Marksmanship Training Support Act (S.1249)

The very first lobbying accomplishment of the National Wildlife Federation, ably facilitated by Ding Darling, was securing Congressional passage in 1937 of the Federal Aid in Wildlife Restoration Act (Restoration Act). This landmark legislation directs that excise taxes on sporting arms and ammunition be dedicated to restoring wildlife, development of access facilities to public lands, and hunter education programs, including construction and operation of public target ranges.

Since its inception, the Federal Aid in Wildlife Restoration Act has generated over $2 billion, which has been augmented by $500 million in matching money from the states implementing the programs. The Federal Aid in Wildlife Restoration Act is strongly supported by hunters and shooters because they know that the special excise taxes on guns and ammunition is dedicated to Restoration Act purposes. More than 62% of the revenue is used to buy, develop, maintain, and operate wildlife management areas. Some 4 million acres have been purchased outright since the program began. The Act's many outstanding conservation successes include restoration of pronghorn, elk, wild turkeys, deer and many other wildlife species.

The Target Practice and Marksmanship Training Support Act (S.1249) would further states' abilities to use Restoration Act funds "to facilitate the construction and expansion of public

target ranges, including ranges on Federal land managed by the U.S. Forest Service and the Bureau of Land Management." We recognize the need to ensure that people of all ages have proper training and facilities to ensure safety in hunting. While supporting this concept, we encourage consideration of several factors.

The toxicity of lead to wildlife, including lead used in ammunition and fishing tackle, is well known. In fact, the National Wildlife Federation lead the charge to ban the use of lead and other toxic substances in shot used for waterfowl hunting because of widespread ingestion of spent lead shot by ducks, geese and other wildlife, thereby causing their death by lead poisoning. It is also well known that shooting ranges can accumulate very large quantities of lead. We encourage Congress to consider ways in which any newly constructed shooting ranges can be managed to encourage voluntary conversion by the public at the shooting range and in their hunting activities, to non-toxic forms of ammunition.

We are also concerned that reduction in the non-federal matching proportion from 25% to 10% reduces the ability to maximize total dollars for Restoration Act purposes, and also comes at the expense of the Restoration Act dollars dedicated specifically to conservation purposes. However, as the bill is written, these impacts will be minimal.

Wildlife Disease Emergency Act (S.357)

Wildlife disease is a growing problem that threatens the well-being of native wildlife. West Nile Virus in birds, Chronic Wasting Disease in Cervids, Chytrid Fungus infection of amphibians, and White-Nose Syndrome in bats are examples of the challenges and widespread impacts of wildlife diseases. Many factors contribute to the spread and impacts of diseases in wildlife, including widespread international trade in wildlife. Although not the subject of this hearing, invasive species, which can carry disease and can even be a disease, is a huge problem which threatens wildlife and ecosystems across the country. For example, feral pigs can spread brucellosis and the invasive Asian tiger mosquito is known to transmit more than 30 different viruses. We urge Congress to strengthen laws and regulations to contain and stop the continued nation-wide epidemic of invasive plants, animals and pathogens entering the United States virtually every day, and which continue to cause widespread and costly damage to wildlife, habitats, agriculture, people, and infrastructure.

White-Nose Syndrome (WNS) in bats, a deadly disease caused by a fungus (*Geomyces destructans*), was first observed in 2006 and is estimated to have killed 5.7 million to 6.7 million bats in eastern North America since then.[1] In addition to its potential spread and impact on bat populations across North America, the decline of this important insectivore may facilitate the spread of diseases transmitted by insects.

Another recent serious wildlife disease is chytridiomycosis in amphibians, caused by the chytrid fungus *Batrachochytrium dendrobatidis*. Thought to have initially been spread by trade of the African clawed frog, it is has now infected many amphibian species throughout the world, included at least four species listed under the Endangered Species Act in the United States—the Wyoming toad, mountain yellow-legged frog, California red-legged frog, and the Chiricahua leopard frog.

The Wildlife Disease Emergency Act (S.357) will facilitate more quickly addressing emerging wildlife diseases by authorizing the Secretary of the Interior to declare a wildlife disease emergency and coordinate rapid response to the emergency, including providing grants to state wildlife agencies and Indian tribes to address the problem. We support the intent of S.357 to provide needed resources via a Wildlife Disease Emergency Fund through the Department of the Interior to quickly address wildlife disease issues in the interest of wildlife conservation. We appreciate that the bill would establish the Wildlife Disease Committee with membership from Federal and state agencies, tribal entities, and "individuals who represent public and private organizations." We suggest further definition of the Wildlife Disease Committee to ensure balanced representation, specifically including representation by one or more national 501(c)3 wildlife conservation organizations, and the National Wildlife Health Center.

We note that the bill restricts the definition of wildlife to native species. As we addressed above, invasive non-native species can be a serious threat to native wildlife. We recommend that this bill provide a means to also address disease in non-native species because of the potential for non-native species to harbor and transmit disease to native wildlife.

Finally, is unclear to us the extent to which this bill would rely on existing legal authority and federal programs already in place to address wildlife disease issues. Nonetheless, ensuring adequate resources to address wildlife disease issues is important, and we welcome the opportunity to work with this committee to further define this bill, including its relationship to existing authorities to address wildlife disease issues..

Delaware River Basin Conservation Act (S.1266)

The National Wildlife Federation supports the Delaware River Basin Conservation Act as it provides a framework for making substantial progress in protecting and restoring the Delaware River Basin. The four-state Basin watershed encompasses the Delaware River—which is the longest undammed river east of the Mississippi—and the ecologically- and economically-significant Delaware Estuary. Protecting ecosystems is critical to protecting wildlife.

More than 200 migrant and resident finfish and shellfish species use the Delaware Estuary for feeding, spawning, or nursery grounds. These species include sharks, skates, striped bass, shad, sturgeon, American eel, blueback herring, Atlantic menhaden, alewife, bluefish, weakfish, and flounder. Oysters and blue crabs are important recreational and commercial shellfish resources in the Estuary; annual landings are currently valued at $14 million[ii]. The Delaware Estuary is also home to the largest population of horseshoe crabs in the world and is an important stop for shorebirds and waterfowl along the Atlantic Flyway[iii]. Natural habitats in this watershed include tidal salt marshes, tidal freshwater marshes, intertidal mudflats, oyster reefs, beaches, inland wetlands, and upland meadows and forests. Historically, the Delaware Estuary's extensive tidal wetlands provided critical habitat for many of the region's threatened and endangered species and are still fundamental for their survival.

The Delaware River, stretching from the Catskill Mountains in New York to the metropolitan hubs of Trenton and Philadelphia, is home to important species such as American shad, bald eagle, river otter, bog turtle, several endangered and threatened freshwater mussels, and brook and brown trout. The river's coldwater streams and tributaries offer some of the best recreational fishing opportunities in the eastern United States. Other habitats include freshwater wetlands and riparian forests and grasslands. Because of the high quality of the habitat in this region, much of the mainstem Delaware River has been included in the National Wild and Scenic Rivers System. This area also provides untreated drinking water to seven million people in New York City.

Changes in land use, the regions legacy of pollution, and declines in living resources are among the top environmental concerns in the Delaware Basin, resulting in habitat loss and negatively impacted fish and wildlife. Data from the National Oceanic and Atmospheric Administration suggests that within a recent 5-year period, the watershed lost between 25 and 35 acres of land to development each day. Forest lands—which provide critical habitat and regulate water quality—experienced the greatest rate of conversion, equating to one football field every two hours.[iv] Such changes in land use are associated with increased stormwater runoff, resulting in discharges of higher concentrations of nutrients, toxics, and heavy metals into the watershed and ultimately to the Delaware Estuary.

The Delaware River Basin Conservation Act (S.1266) would address these concerns and greatly benefit wildlife and wildlife habitat. The bill would require the U.S. Fish and Wildlife Service, in partnership with other federal agencies, to establish a non-regulatory Delaware River Basin Restoration Program to increase coordination and collaboration of conservation efforts currently underway in the entire Basin. The legislation would also establish a competitive grants program—along with much-needed technical assistance—to add to the limited federal resources available to the watershed for (1) the restoration or protection of fish and wildlife species and habitats, and the (2) improvement or protection of water quality.

NWF believes that this S.1266 will provide much needed resources for this important ecosystem. We support the Delaware River Basin Conservation Act and applaud the committee for favorably reporting it in December 2011.

North American Wetlands Conservation Extension Act (S. 2282)

The North American Wetlands Conservation Act (NAWCA) serves as a model for successful public-private cooperation for on-the-ground wildlife conservation. The National Wildlife Federation supports the extension of this valuable habitat program.

Since its inception nearly a quarter-century ago, NAWCA has facilitated the protection and restoration of more than 26 million acres of important wetlands and other habitats in all 50 states. Wetlands sustain tremendous biodiversity, and a variety of wetland-dependant species directly benefit from this investment in conservation, including ducks and geese, shorebirds, frogs and salamanders, beavers and otters, myriad invertebrates and many species of fish. Additional community benefits include expanded outdoor recreation opportunities (including hunting, fishing, wildlife watching and photography) and improved water quality.

Because of the competitive nature of the grant program, NAWCA leverages each dollar in public funds with more than three in private dollars—despite only requiring a one-to-one match. This impressive financial commitment signifies strong support for conservation and restoration from local partners, landowners, and private organizations; more than 4,500 partners have contributed to NAWCA projects over the years.

For example, the Kansas Wildlife Federation, an affiliate of the National Wildlife Federation, partnered with a dozen other organizations and agencies in 2011 to complete the 243-acre Slate Creek wetland restoration project in Sumner County, Kansas. The $75,000 small NAWCA grant was matched with more than $300,000 in private funding contributions, equating to a private-public ratio of four-to-one. This project will provide well-managed and robust habitat for northern pintails, mallards, redheads, canvasbacks, little blue heron, American bittern and marsh wren.

Because NAWCA has a proven track-record of incentivizing significant investment in high-quality habitat protection and restoration efforts across North America, NWF supports bipartisan Congressional efforts to reauthorize this program.

Conclusion

In conclusion, we appreciate the committee's effort to address the important wildlife issues discussed in today's hearing, and look forward to working with you to further develop the proposed bills. Addressing these wildlife issues is important to help protect and conserve wildlife for our children's future.

Thank you.

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[i] http://batcon.org/pdfs/USFWS_WNS_Mortality_2012_NR_FINAL.pdf

[ii] Kauffman, Gerald. 2011. *Economic Value of the Delaware Estuary Watershed.* University of Delaware, Newark DE.

[iii] Dove, L.E., and R.M. Nyman (ed). 1995. *Living Resources of the Delaware Estuary.* Delaware Estuary Program Report Number 95-07. Partnership for the Delaware Estuary, Wilmington, DE

[iv] National Oceanic and Atmospheric Administration, Coastal Services Center. 2008. *Assessing the Delaware River Basin Using Land Cover Information.* http://www.csc.noaa.gov/digitalcoast/action/ccap-de-river

Questions for Inkley

Senator Barbara Boxer

1. Can you please describe the importance of investing in the conservation programs that would be authorized or reauthorized by the legislation considered at this hearing? What wildlife and economic benefits can be expected?

The Permanent Electronic Duck Stamp Act of 2012 Section (S.2071), the Migratory Bird Habitat Investment and Enhancement Act (S.2156), the National Fish and Wildlife Foundation Reauthorization Act (S.1494), the North American Wetlands Conservation Extension Act (S. 2282), and the Target Practice and Marksmanship Training Support Act (S.1249) all pertain to extremely successful long-standing wildlife conservation programs previously established by the U.S. Congress. The current bills would allow the continuation and improvement of these critical wildlife conservation programs. The abundance of wildlife and wildlife habitat our country enjoys today is due in no small part to these programs, and must be continued as the pressures on wildlife continue to increase. Furthermore, abundant wildlife is a strong economic driver. According to the U.S. Fish and Wildlife Service:

> *"...87.5 million U.S. residents fished, hunted, or watched wildlife in 2006. They spent over $122 billion pursuing their recreational activities, contributing to millions of jobs in industries and businesses that support wildlife-related recreation. Funds generated by licenses and taxes on hunting and fishing equipment pay for many of the conservation efforts in this country and provide many hours of fishing, hunting, and wildlife-associated recreation."*

The Wildlife Disease Emergency Act (S.357) will help to quickly address emerging diseases in wildlife before they become widespread, increasingly the likelihood of effective control and at lower long-term costs. We suggest further specification of membership of the Wildlife Disease Committee to ensure balanced representation, specifically including representation by one or more national 501(c)3 wildlife conservation organizations, and the National Wildlife Health Center. We also recommend that this bill provide a means to also address disease in non-native species because of the potential for non-native species to harbor and transmit disease to native wildlife.

*The Delaware River Basin Conservation Act (S. 1266) would authorize the U.S. Fish & Wildlife Service to establish a Program to maximize and coordinate on-going and future conservation and restoration activities in the entire Delaware River Basin. Expanded and more harmonized on-the-ground conservation efforts will reduce flood damage and improve fish and wildlife habitat, water quality and economic well-being for communities throughout the watershed. The Basin's natural resources are an important economic driver in the region, generating more than 600,000 jobs in New York, Pennsylvania, New Jersey and Delaware (*Kauffman, G. 2011.

Socioeconomic Value of the Delaware River Basin. University of Delaware Water Resources Agency.) *Investing in the betterment of the Basin's ecosystems will ultimately ensure job growth and continued economic vitality.*

Senator Tom Carper

Can you please expand on the level of federal investment in the Delaware River Basin watershed as compared with the level of federal investment in other nationally-significant watersheds? Over time, what are some of the risks ecologically, economically and otherwise that could come to be if the current level of federal investment in the Delaware River watershed remains unchanged?

When compared to other large aquatic ecosystems, the Delaware River Basin in its entirety has received minimal federal investment for conserving and restoring its natural resources. Traditionally, federal dollars have been focused primarily on the Delaware Estuary portion of the watershed through the National Estuary Program. This program is certainly critical for the health of the lower Basin, but is not applicable to more than half of the watershed. For decades, this bifurcation of the system has limited the delivery of coordinated—and more effective—conservation on the ground. The Delaware River Basin Conservation Act (S. 1266) would establish a Basin-wide Program to maximize coordination, collaboration and efficiency in conservation efforts by States, local governments and non-profit organizations. This program will also infuse the area with funding through a competitive grant program which requires matching private dollars—a much-needed catalyst for continued and expanded conservation work.

*Although millions of people rely on the watershed as an engine that generates $22 billion in annual economic activity, relative federal investment in the health of the watershed has lagged behind. Specifically, wildlife-dependant recreation—including bird-watching, hunting and fishing—generates more than $1.5 billion and is a critical component of the economy in the region. A continued lack of coordination and dwindling resources puts this sector and its 45,000 jobs at risk (*Kauffman, G. 2011. *Socioeconomic Value of the Delaware River Basin*. University of Delaware Water Resources Agency.)

Senator Benjamin Cardin

Duck stamp bills (The Migratory Bird Habitat Investment and Enhancement Act (S.2156) and Permanent Electronic Duck Stamp Act (S. 2017))

1. Does the National Wildlife support enactment of these bills?
The National Wildlife Federation supports both The Migratory Bird Habitat Investment and Enhancement Act (S.2156) and Permanent Electronic Duck Stamp Act (S. 2017), and urges Congress to pass these bills. In an age of advancing electronic technologies, the Permanent Electronic Duck Stamp Act of 2012" (S.2071) would facilitate electronic sales of the duck stamp while retaining the long tradition of the annual duck stamp contest and collection of duck

stamps by hunters and other supporters. The Migratory Bird Habitat Investment and Enhancement Act (S.2156) provides a much-needed mechanism by which the price of the duck stamp can be periodically assessed and raised to continue its effectiveness as property values and the consumer price index increase.

2. Does the National Wildlife Federation recommend any changes to these bills?
   No, we urge passage of The Migratory Bird Habitat Investment and Enhancement Act (S.2156) and The Permanent Electronic Duck Stamp Act (S. 2017) as currently drafted.

Target Practice and Marksmanship Training Support Act

3. Your testimony mentions the occurrence of negative impacts on wildlife due to lead toxicity from target shooting ranges. Can these negative impacts be mitigated? Please elaborate.

   The safest and most cost-effective way to mitigate any potential negative impacts to wildlife due to heavy lead deposition at shooting ranges is to prevent lead deposition from spent ammunition from occurring in the first place, by the use of non-toxic alternatives to lead, such as steel shot and copper bullets. We recommend Congress include provisions in this legislation to improve on-site (at the shooting ranges) education about the dangers to wildlife of lead in ammunition and encourage conversion by shooters to non-toxic ammunition on shooting ranges and in their outdoor hunting activities.

Senator Jeff Sessions

1. In your testimony, you express strong support for S. 1249 (Target Practice and Marksmanship Training Support Act). I was interested to read in your testimony that you disagree with the bill's language that would reduce the non-federal matching proportion from 25% to 10% for purposes of providing public target practice facilities. Are you concerned that, as proposed, the cost-share provisions will actually result in less overall spending on target practice facilities on federal lands than if the non-federal cost-share was higher?

   Yes, we are concerned that the total amount invested in shooting ranges will be lower as a result of reducing the non-federal match from 25% to 10%. If $10 million federal dollars are available (for example), a 90:10 federal:state match would facilitate a total of only $11.1 million invested in shooting ranges, whereas a 75:25 federal:state match would facilitate a total (federal and state) investment of $13.3 million in shooting ranges under this bill, yielding a greater return on each federal dollar invested. Furthermore, to avoid the reduction of money invested directly in conservation, we recommend that the funding for this program come from the hunter education portion, not the wildlife restoration portion, of the Federal Aid in Wildlife Restoration program.

2. Dr. Inkley, you are a strong supporter of S. 1494, which would reauthorize the National Fish & Wildlife Foundation program. What are some of the most significant conservation achievements obtained through this program in recent years?

The National Fish & Wildlife Foundation (NFWF) has been enormously successful in achieving on the ground conservation through partnerships. Following are but a few examples of their many successes. Since 2004, NFWF and the Southern Company have invested over $8.7 million into projects which will restore more than 82,000 acres of longleaf pine forest. Another outstanding on-going project is the collaboration of the EPA Chesapeake Bay Program and NFWF, which will preserve 3,729 acres of land, restore 32 miles of riparian areas and stream banks and implement the best stormwater management practices on 2,878 acres. Operation Migration has been helping to restore the endangered whooping crane. The Sea Turtle Conservancy, NFWF and the National Wildlife Federation were among other collaborators helping to safely relocate more than 25,000 sea turtle eggs at risk from the Gulf oil spill into cleaner areas on Florida's Atlantic Coast. NFWF has been a leader laying the groundwork for removal of the Great Works Dam on which commenced on June 11th, 2012 after years of effort, and will help restore migrating Atlantic salmon to the Penobscot River.

Senator CARDIN. It is a pleasure to have you before the Committee.

Dr. Wasserman.

STATEMENT OF MARTIN WASSERMAN, M.D., J.D., FORMER SECRETARY, MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE, AND FORMER ADMINISTRATOR, OREGON PUBLIC HEALTH DEPARTMENT

Dr. WASSERMAN. Thank you, Chairman Cardin.

Thanks for inviting me to speak on behalf of the Great Ape Protection and Cost Savings Act. I am Dr. Martin Wasserman, and I have lived in Maryland for 45 years. And I received both my medical and law degrees here. I have treated children on the Navajo Reservation in New Mexico as well as in West Baltimore at University Hospital.

Particularly relevant to today's discussion, though, I have also been the Medical Director of Immunization Practices and Scientific Affairs for the Vaccine Division of GlaxoSmithKline Pharmaceuticals. As both a pediatrician and public health physician, I have always placed patients first.

But when certain animal research or experimentation is no longer necessary, I have also considered my Hippocratic Oath which constantly reminds me to "do no harm." To that end, I believe we have an obligation to utilize the most effective scientific methodologies when performing research in order to improve the public's health.

The legislation before you today has many components. One, it recognizes the social and behavioral similarities of chimpanzees and humans. But even though we share 95 to 98 percent of each other's genetic material, the expression of these genes can be dramatically different in our two species.

Two, it acknowledges chimpanzee contribution to past medical research, like polio, as stated, in 1950. But because of recent advances in scientific methodology, it recognizes that continuing to use them is unnecessary. Three, it rewards these animals' service by phasing out invasive experimentation as we gain new knowledge and methodologies and provides lifetime care in a Federal sanctuary.

Four, it codifies and provides the force of law, the force of law—the force of law—to the current NIH voluntary breeding moratorium and ends breeding of chimpanzees for the purpose of invasive research. And fifth, it will save the Government $300 million over the next 10 years.

Four months ago the Institute of Medicine released a report on the necessity of chimpanzee research, initiated at the request of Senators Harkin, Udall, and Bingaman. As Dr. Anderson stated, Dr. Collins and NIH have taken the IOM report seriously, and they are to be applauded for their efforts.

But theirs is the response of the current NIH leadership. And as we well know, administrations change, leaders change, and policies change. Passing this bill will exclusively focus on chimpanzees. It will ensure that invasive experimentation in chimpanzees will be phased out in the future and will encourage researchers to adopt alternative, more timely, and more fruitful research approaches.

In the IOM report, the authors did not find a single area of human health research for which chimpanzees are necessary. Even during their discussions of hepatitis C disease, the authors concluded that chimpanzees are not necessary for either anti-viral drug discovery or development or the development and testing of a therapeutic vaccine, and also that it is both possible and ethical to bring a preventive vaccine to human testing without using chimpanzees.

Although hepatitis C remains a serious worldwide public health problem, further chimpanzee research will not be helpful in our battle against this disease. A variety of alternative research approaches for hepatitis C are available, including the VaxDesign MIMIC system. This human-based, in vitro system is appropriate for every stage of drug and vaccine development. Some businesses are developing new research methodologies already, and I am proud that my former company, GlaxoSmithKline, is no longer using chimpanzees in its research.

Let me clear up a misunderstanding with regard to the Food and Drug Administration and chimpanzee research. The FDA does not require the use of chimpanzees for either drug or vaccine testing. In fact, during the past year the FDA approved two new drugs for hepatitis C, Bociprevir and Telaprevir, neither of which used chimpanzees in either the development or testing phase.

In the beginning of my comments I mentioned the Hippocratic Oath, to "do no harm." Consider the following. The United States is the only Nation in the world known to use captive chimpanzees for large scale invasive research. These animals respond to stress and trauma as we do. Published studies reveal that they suffer symptoms of post-traumatic stress disorder, and when used in research they become clinically depressed and demonstrate multi-organ diseases.

Since there is little we will gain by continuing to use them in research, there is no need to continue to keep them in costly laboratories where complex social and psychological needs cannot be met.

In conclusion, concerns have been expressed that passing this bill would preclude the use of chimpanzees in the case of a national emergency. During the IOM hearings, experts in biodefense stated that chimpanzees would make poor models for future emerging diseases because of their slow response times, in terms of months rather than days.

The bill's sponsors have agreed to include an amendment inserting an emergency clause in case of a dire public health crisis. Provided it remains transparent, the clause should sufficiently address any public health concern about the future need for chimpanzees in research.

I respectfully request that you pass the Great Ape Protection and Cost Savings Act. It will end a cycle of wasteful and unnecessary research, save money, and protect chimpanzees who have already given so much of their lives to research in the past.

Thank you.

[The prepared statement of Dr. Wasserman follows:]

Statement of:
Martin Wasserman, M.D, J.D.
Before the United States Senate
Committee on the Environment and Public Works
Subcommittee on Water and Wildlife
April 24, 2012

Chairman Cardin, Ranking Member Sessions, thank you for inviting me to speak today before the subcommittee in support of the Great Ape Protection and Cost Savings Act. My name is Dr. Martin Wasserman. I have lived in Maryland for 45 years. It is where I received both of my graduate degrees: in medicine from Johns Hopkins University, and in law from the University of Maryland. I have served as the chief health officer for Maryland's two largest jurisdictions as well as for Arlington County, Virginia. I have also served as State Health Secretary for both Maryland and Oregon and have been the Executive Director of MedChi, the Maryland State Medical Society, advocating for more than 25,000 physicians. I also served as Medical Director of Immunization Practices and Scientific Affairs in the Vaccine Division of GlaxoSmithKline Pharmaceuticals.

As a public health doctor and as a pediatrician, I have always placed patients first when balancing human needs against the needs of animal test subjects, but I have also considered my Hippocratic Oath, which constantly reminds me to "do no harm." And that is why I am here today to testify in support of the Great Ape Protection and Cost Savings Act.

This important piece of legislation is a bill of recognition, appreciation, and sensitivity. It recognizes the genetic, social, and behavioral similarities of chimpanzees and humans, who are 95 to 98 percent genetically similar. It also acknowledges that the expression of these genes is

dramatically different in chimpanzees and humans. It appreciates the past value of their contribution to medical research that has benefited humans but also recognizes the advances that have occurred in science since I was in medical school—advances that have rendered the use of chimpanzees unnecessary. It sensitively rewards these animals' service with lifetime care in a federal sanctuary. And it will save the government $300 million over the next 10 years.

In addition to phasing out invasive experimentation on chimpanzees and releasing federally-owned chimpanzees to sanctuaries, this bill will codify the current National Institutes of Health's (NIH) voluntary breeding moratorium preventing any future violations like those that occurred between 2000-2011 when 137 chimpanzees were born to federally-owned chimpanzees at the New Iberia Research Center in Louisiana, and end the breeding of chimpanzees for the purpose of invasive research.

The timing of today's hearing is perfect. Just four months ago, the Institute of Medicine (IOM) released its report *Chimpanzees in Biomedical and Behavioral Research: Assessing the Necessity*, compiled at the request of Senators Harkin, Udall, and Bingaman. NIH has taken the IOM report seriously, and they are to be applauded for their efforts. But theirs is the response of current NIH leadership, and—as we all know—administrations change, leaders change, and policies change. Passage of this bill is essential to ensure that the unnecessary use of chimpanzees in invasive experimentation will not occur in the future.

In the Institute of Medicine report, the authors did not find a single area of human health research for which chimpanzees are necessary. Although there has been some discussion regarding hepatitis C, the authors of the report concluded the following: 1) "Chimpanzees are not necessary for hepatitis C antiviral drug discovery and development;" 2) "Chimpanzees are not necessary for the development and testing of a therapeutic hepatitis C vaccine;" and 3) it is "possible and ethical" to bring a hepatitis C preventive vaccine to human testing without using chimpanzees. In fact I'm proud that my former company, GlaxoSmithKline, publicly stated in

2008 that it would no longer use chimpanzees in their research. While I recognize that more than 130 million people worldwide live with chronic hepatitis C, and that this disease is a serious public health issue, it is indisputably clear that chimpanzee research is not a necessary tool in our battle against hepatitis C.

As a graduate of Johns Hopkins University I commend the schools of medicine and public health for their longitudinal studies of human hepatitis C patients. This long-term study of hepatitis C-infected intravenous drug users provides human-specific information regarding many aspects of hepatitis C acquisition, natural history, therapeutic responses, and vaccine opportunities. This, and similar studies, combined with the numerous human-based culture systems provides a more appropriate and reliable research methodology than redundant protocols using chimpanzees. The Modular IMmune In vitro Construct (MIMIC) System, for example, replicates the human immune system and is appropriate for every stage of drug and vaccine development. The MIMIC system, supported and funded by the U.S. Department of Defense specifically to develop biodefense vaccines, is an example of where science is now and could be used in the development of vaccines for human immunodeficiency virus (HIV), hepatitis C and other life-threatening diseases.

Let me also clear up a misunderstanding with regard to the Food and Drug Administration (FDA) and chimpanzee research. The FDA does not require the use of chimpanzees for either drug or vaccine testing. In 2011, the FDA approved two new therapeutics for hepatitis C—the first in 25 years— from Merck and Vertex Pharmaceuticals and there are two additional drugs from Pharmasset and Bristol-Myers Squibb in the pipeline. None of these four medications used chimpanzees for either development or testing. The IOM report described a variety of alternative research approaches to the continued use of chimpanzees, including cell-based testing and recombinant technologies, which are widely used for the development of monoclonal antibodies.

Significant advances have been made in the development of a malaria vaccine without the use of chimpanzees. A vaccine developed by GlaxoSmithKline—which as I stated earlier does not use chimpanzees—halved the risk for malaria infection in a final-stage trial of more than 15,000 African children. Ann-Marie Cruz, Ph.D., with the PATH Malaria Vaccine Initiative, told the IOM committee that chimpanzees were not essential to malaria vaccine research because humans can be used and represent a better model.

In the 1980s the U.S. expanded its breeding program because chimpanzees were believed to be critical for HIV research. Although, more than 85 HIV vaccines were developed and exhibited benefits in chimpanzees and other non-human primates, all failed in approximately 200 human trials. One vaccine that proved to be safe and effective in chimpanzees actually appeared to increase the chances of infection in humans. As someone who has worked in public health for 30 years devoted to finding solutions for patients infected with HIV and other diseases, I find it disheartening that millions of dollars were allocated toward HIV and other research using chimpanzees without significant benefits to humans when those dollars could have been better spent pursuing alternative methodologies.

At the outset, I mentioned the Hippocratic Oath to "do no harm." Consider the following: The United States is the only nation in the world that is known to still use captive chimpanzees for large-scale invasive research. Chimpanzees respond to stress and trauma as we do. Published studies reveal that they suffer symptoms of post-traumatic stress disorder and that chimpanzees used in research become clinically depressed. Since there is little we will gain by continuing to use them in research there is no need to continue to keep them in laboratories.

Concerns have been expressed that the passage of this bill would forever preclude the use of chimpanzees in research, even in the case of a national emergency. To address this concern, the Institute of Medicine received testimony from experts in biodefense representing the National Institutes of Health and the Department of Homeland Security, who stated that chimpanzees

would make poor models for future emerging diseases. Nonetheless, I understand the bill's sponsors have agreed to include an amendment that would insert an "emergency clause" in case of a future dire public health crisis. From the public health perspective, I believe this new clause would address any concerns about the future need for chimpanzees in research.

In closing, I respectfully request that you pass the Great Ape Protection and Cost Savings Act in order to focus on new alternative research methodologies, end a cycle of wasteful and unnecessary research, and protect chimpanzees who have already given so much of their lives.

Thank you, and I look forward to your questions.

ATLA 37, Supplement 1, 19–27, 2009

An Immunologic Model for Rapid Vaccine Assessment — A Clinical Trial in a Test Tube

Russell G. Higbee, Anthony M. Byers, Vipra Dhir, Donald Drake, Heather G. Fahlenkamp, Jyoti Gangur, Anatoly Kachurin, Olga Kachurina, Del Leistritz, Yifan Ma, Riyaz Mehta, Eric Mishkin, Janice Moser, Luis Mosquera, Mike Nguyen, Robert Parkhill, Santosh Pawar, Louis Poisson, Guzman Sanchez-Schmitz, Brian Schanen, Inderpal Singh, Haifeng Song, Tenekua Tapia, William Warren and Vaughan Wittman

VaxDesign Corporation, Orlando, FL, USA

Summary — While the duration and size of human clinical trials may be difficult to reduce, there are several parameters in pre-clinical vaccine development that may be possible to further optimise. By increasing the accuracy of the models used for pre-clinical vaccine testing, it should be possible to increase the probability that any particular vaccine candidate will be successful in human trials. In addition, an improved model will allow the collection of increasingly more-informative data in pre-clinical tests, thus aiding the rational design and formulation of candidates entered into clinical evaluation. An acceleration and increase in sophistication of pre-clinical vaccine development will thus require the advent of more physiologically-accurate models of the human immune system, coupled with substantial advances in the mechanistic understanding of vaccine efficacy, achieved by using this model. We believe the best viable option available is to use human cells and/or tissues in a functional *in vitro* model of human physiology. Not only will this more accurately model human diseases, it will also eliminate any ethical, moral and scientific issues involved with use of live humans and animals. An *in vitro* model, termed "MIMIC" (Modular IMmune *In vitro* Construct), was designed and developed to reflect the human immune system in a well-based format. The MIMIC® System is a laboratory-based methodology that replicates the human immune system response. It is highly automated, and can be used to simulate a clinical trial for a diverse population, without putting human subjects at risk. The MIMIC System uses the circulating immune cells of individual donors to recapitulate each individual human immune response by maintaining the autonomy of the donor. Thus, an *in vitro* test system has been created that is functionally equivalent to the donor's own immune system and is designed to respond in a similar manner to the *in vivo* response.

Key words: *clinical trial, drug testing, functional assays, high-throughput, immune response, infectious disease,* in vitro, *vaccine.*

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MIMIC® System Technology Overview

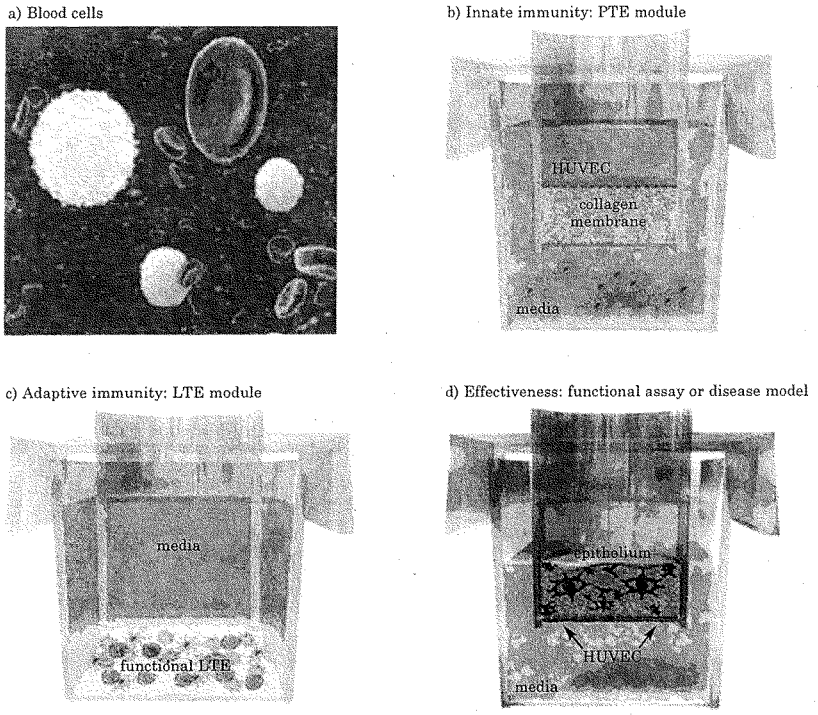
The MIMIC System is based on the multidimensional interrogation of leucocytes. It can simulate a clinical trial, including the effects of immunotherapy on human population subgroups, where responses can be clustered into groups that capture genetic diversity and other important population characteristics, such as HLA haplotypes, age, autoimmune status, and gender. We hope that this dataset can guide the design of rapid and incisive adaptive clinical trials, as well as overcome limiting and misleading animal studies in predicting the immunogenic potential of non-homologous proteins and many vaccine candidates.

The MIMIC System is comprised of four different steps: 1) leucocyte collection and preservation, 2) the Peripheral Tissue Equivalent (PTE), 3) the Lymphoid Tissue Equivalent (LTE), and 4) functional assays for assessing the *in vitro* immune response (Figure 1).

Step one begins with the collection of donor leucocytes by aphæresis at a local blood bank. The processing of the leucocytes typically begins within an hour after collection, and the entire process to cryopreservation takes less than 4 hours. From a single aphæresis donation, approximately 10 billion leuco-

This paper was originally presented at the *Speed and Safety in Drug Discovery* discussion meeting, hosted by Safer Medicines Trust, and held on 26 November 2008 at the Royal Society, London (www.drugtestingconference.com).

Figure 1: The four modules of the MIMIC System



The four component modules of the MIMIC System: a) The collection of leucocytes from donors and their preservation; b) The second module, the Peripheral Tissue Equivalent (PTE) module, simulates innate immune responses. It comprises a monolayer of human umbilical vein endothelial cells (HUVEC) cultured above a 3-dimensional extra-cellular matrix upon which peripheral blood mononuclear cells (PBMCs) are applied; c) The third module, the Lymphoid Tissue Equivalent (LTE) module, simulates the adaptive immune response that would occur in the lymph node. Dendritic cells, follicular dendritic cells, T-cells and B-cells are applied in the correct sequential order to mimic the immune response expected in vivo*; d) Functional assays, which indicate whether the immune response generated in the preceding modules is effective against the chosen stimulant or pathogen.*

cytes are obtained and processed for cryostorage by standard methods, whereby the donor's cells may be used at a later date. This approach allows multiple experimental iterations, such as different compounds, doses or combinations, including enough of each to obtain statistically meaningful data. Because of the nature of the studies and the ability to cryopreserve cells, all the relevant controls, such as no treatment, drug alone and pathogen alone, can be run on the same "surrogate human" at the same time. This is in striking contrast to what can be done with non-human primates (NHP) or in human clinical trials. An additional advantage over both NHP studies and human clinical trials is that the experiments can be repeated on the same "individual", as a portion of the primary cells can be frozen and stored for future use.

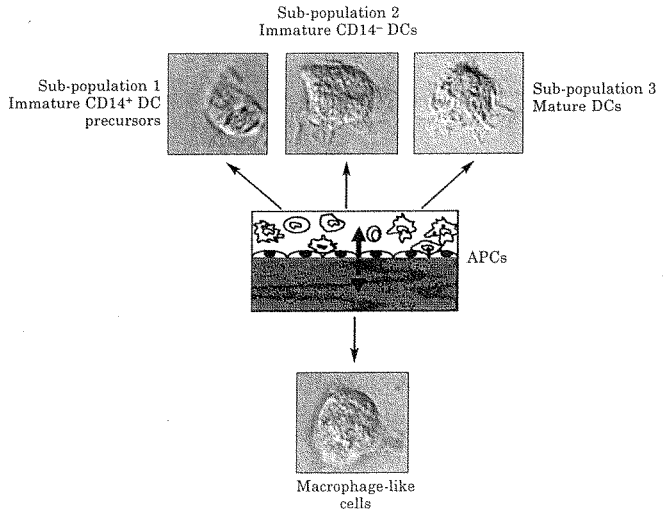
The second step is to simulate a peripheral tissue. For this, we developed innate immune responses in the Peripheral Tissue Equivalent (PTE) module. The

PTE module allows for a broad assessment of responses, from toxicity to proinflammatory immunoreactogenicity (testing vaccines, antigens, adjuvants, biologics, therapeutics and chemicals), to antigen processing, vascular leakage and leucocyte infiltration, maturation and extravasation. This module is a high-throughput, fully-automated, flexible and reproducible, 3-dimensional tissue-engineered construct, mimicking peripheral microvasculature and recapitulating peripheral circulatory and fast innate responses. The PTE also links to the adaptive arm of the immune system, allowing self-differentiation of extravasating monocytes into potent antigen-presenting migratory dendritic cells (DCs).

The third step is to simulate adaptive immune responses in the Lymphoid Tissue Equivalent (LTE) module. The LTE is essentially an artificial lymph node, where antigen-presenting cells from the immune system, the body's "sentinel" cells, start working with the immune system's T-cells and B-cells. Specifically, the LTE is designed to reflect the spatio-temporal kinetics in a lymph node, e.g., DC–T-cell interactions, antigen–B-cell interactions, T-cell and B-cell interactions. Th1 or Th2 polarisation bias, antigen-specific antibody production or cytotoxic T-cells, can all be assessed from this *in vitro* module.

The fourth step is to assess the immunocytes and biomolecules from the previous modules in a functional assay, such as microneutralisation assays, haemagglutination inhibition, adherence inhibition, CTL responses, or disease modelling. Having all of these modules operating in a robotics platform provides a high-throughput, reproducible, platform where multiple drug/vaccine candidates can be tested on multiple donors at the same time, without subjecting the actual individual to a potentially dangerous substance.

Figure 2: The three populations of cells which arise in the Peripheral Tissue Equivalent (PTE) module



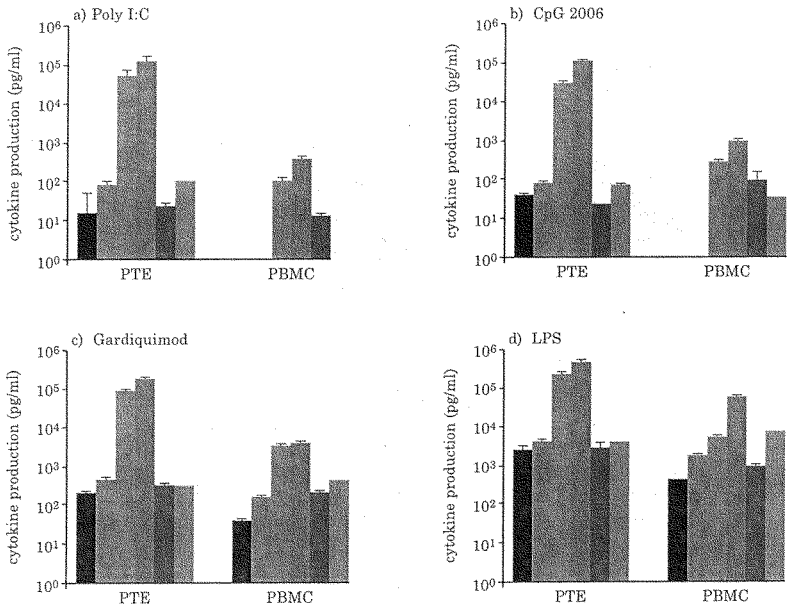
Three populations of cells arise following the application of peripheral blood mononuclear cells (PBMCs) to the PTE module. Sub-population 1 comprises immature CD14⁺ dendritic cell precursors while sub-population 2 comprises immature dendritic cells (CD14⁻), and sub-population 3 comprises mature dendritic cells. A fourth population is more macrophage-like and is retained in the collagen matrix. DC = dendritic cells, APCs = antigen presenting cells.

(Sanchez-Schmitz, G., Fahlenkamp, H.G., Ma, Y., Poisson, L., Warren, W.L., Mishkin, E. & Higbee, R. (2006). *An autonomously driven* in vitro *human immune system for vaccine testing.* Ninth International Congress on Dendritic Cells. Edinburgh, UK.)

The PTE Module

The PTE module has been well characterised, and is a unique method of generating autologous dendritic cells by using a 3-dimensional tissue engineered construct (1–3). Simply put, the PTE module is a high-throughput module that spontaneously and autonomously generates dendritic cells (DCs), the principal antigen processing cells (APCs) of the immune system. The PTE is comprised of a human endothelial monolayer grown to confluence over a 3-dimensional extracellular matrix (Figure 1), onto which purified peripheral blood mononuclear cells (PBMCs) are placed. The immature monocyte population of cells extravasates across the endothelial monolayer, migrating into the matrix, where they spontaneously and autonomously differentiate into migratory DCs with different maturation states (Figure 2). The DCs then spontaneously reverse transmigrate across the endothelial layer — a process that reflects APCs crossing the lymphatics. Upon reverse transmigration across the endothelium, the APCs are then collected. At any point along their journey through the PTE, cultures can be stimulated with antigen/adjuvant/drug compounds of choice.

Figure 3: A comparison of the cytokine response to immunomodulators in the MIMIC System and the industry-standard PBMC assay



= *IL-1α*; = *IL-1β*; = *IL-6*; = *IL-8*; = *IL-10*; = *TNFα*.

A comparison of the MIMIC System PTE module and the industry-standard PMBC assay was made using the same individual donor's blood cells. Immunomodulators, representing different classes, were applied to the PTE and the PMBC assay and the cytokine response was plotted on a log scale. PTE = Peripheral Tissue Equivalent; PBMC = Peripheral Blood Mononuclear Cell; IL= interleukin; poly I:C = polyinosinic : polycytidilic acid; CpG = unmethylated synthetic cytosine-phosphate-guanosine oligodeoxy nucleotides; LPS = lipopolysaccharide. Gardiquimod™ is an imidazoquinoline compound developed by InvivoGen.

The monocyte extravasation and the DC development kinetics match *in vivo* physiology. An important aspect of the PTE is that the migratory DCs remain largely immature in the absence of an external stimulus. We have found that these immature DCs can acquire and process antigen when properly stimulated by adjuvants, maturing into potent DCs capable of initiating antigen-specific immune responses in LTE co-cultures. These DCs have shown the capacity to induce antigen-specific lympho-proliferation, cell-mediated cytotoxicity and T-helper cytokine production.

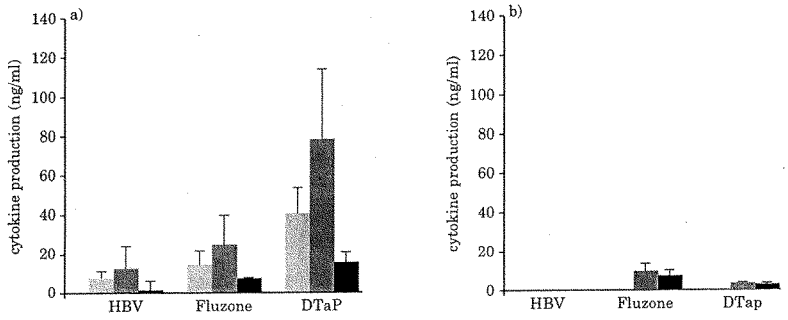
We have found that PTE-derived DCs are very similar to *in vivo* DCs. The PTE has shown that naturally extravasated monocytes constitutively and autonomously differentiate into either migratory DCs, or resident macrophages, in absence of stimulation, and this normally takes between 1–3 days; similar kinetics have been reported *in vivo* for both humans and animals (4–8). The transendothelial migration of blood monocytes promotes differentiation into potent antigen-presenting DCs in humans and animals (9–11), as observed in the PTE; extravasation of leucocytes is increased via endothelium activation in both the PTE and *in vivo* (12). Crossing the endothelium in the abluminal-to-luminal direction (reverse transmigration) in the PTE resembles the *in vivo* entrance of DCs into the lymphatics (13).

Similarly, *in vivo*, skin DCs will be one of the first cell types to engage a pathogen or foreign material, such as a vaccine or a topically applied chemical. The DCs produced by the PTE have been extensively characterised, and were found to be very similar in the expression of numerous surface markers to those of human dermal explants (14). Additionally, three subpopulations of DCs are also characteristic of PTE-generated DCs: immature DC precursors ($CD14^+$), immature DCs ($CD14^-$), and mature DCs ($CD14^-$, $HLA\text{-}DR^+$, $CD86^+$, $CD83^+$), along with a fourth population of cells that differentiate to a more macrophage-like phenotype and do not reverse transmigrate back across the endothelial monolayer (Figure 2).

The PTE has been found to largely recapitulate innate immune responses, when tested with vaccines, adjuvants, biologics, immunopotentiators, immunosuppressants and various pathogens. The PBMC assay is the accepted industry-wide standard for studying immune reactions (15). The MIMIC System has been found to produce a more physiologically relevant response than the PBMC assay (Figure 3) for various adjuvants and immunomodulators.

To evaluate the immunopotency of Toll-like receptor (TLR) agonists in the *in vitro* lymphatic PTE module, we measured TLR-induced cytokine production. Overall, TLR agonists induced higher levels of cytokines in the PTE module than in

Figure 4: The cytokine response to vaccines: A comparison of the MIMIC™ System PTE module and the industry-standard method



= *IL-6;* = *IL-8;* = *MCP-1.*

a) PTE-derived DCs; b) monocyte-derived DCs.

Dendritic cells (DCs) created in the MIMIC System PTE module and monocyte-derived dendritic cells were exposed to three vaccines and the production of three inflammatory cytokines (IL-6, IL-8 and MCP-1) was measured. PTE = peripheral tissue equivalent; HBV = hepatitis B virus vaccine; IL = interleukin; MCP = monocyte chemotactic protein; DTaP = diphtheria, tetanus toxoid and acellular pertussis vaccine; Fluzone® = a killed, trivalent influenza vaccine.

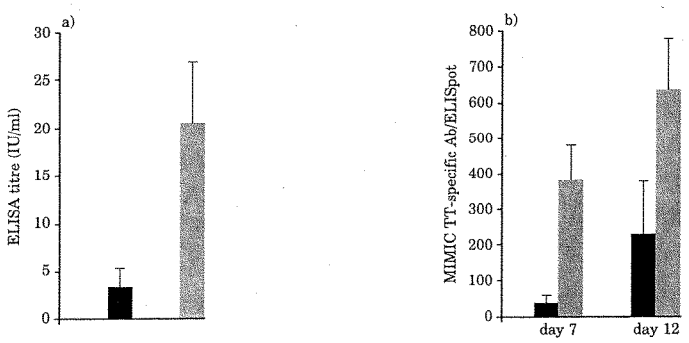
conventional PBMC cultures (Figure 3). For example, polyinosinic:polycytidylic acid (Poly I:C) and unmethylated synthetic cytosine-phosphate-guanosine oligodeoxy nucleotides (CpG 2006), both induced the proinflammatory cytokines IL-1 α/β in the PTE module, but neither of these cytokines were observed in PBMC cultures. Poly I:C also triggered the production of TNFα only in the PTE culture (Figures 3a and 3b). Moreover, Poly I:C and CpG 2006 treatments elicited approximately 100–1000 fold greater levels of IL-6 and IL-8 in the PTE module than in PBMC cultures. Although Gardiquimod and LPS dramatically induced IL-1 α/β, IL-6, IL-8, IL-10, and TNFα, both in the PTE module and in the PBMC cultures, the PTE module produced approximately 3–6 fold more IL-1 α/β and IL-10, and 10–50 fold more IL-6 and IL-8, than PBMC cultures (Figures 3c and 3d). Hence, the PTE module was found to be more sensitive than conventional PBMC cultures in response to TLR stimulation (Ma *et al. Assessing the immunopotency of Toll-like receptor agonists in an* in vitro *tissue engineered immunological model.* Manuscript in preparation).

When stimulated by vaccines, the PTE module mimics the *in vivo* state by producing cytokines known to be involved with inflammatory processes. Figure 4 shows the general innate reactogenicity of the commercially available vaccines, DTaP (Sanofi Pasteur, Inc.), Fluzone® (Sanofi Pasteur, Inc.) and Recombivax® (Merck & Co., Inc.), assessed by detection of a panel of proinflammatory cytokines in the PTE module. As can be seen, the reactogenicity is highest for DTaP probably as a result of a combination of bacterial components from diphtheria and acellular pertussis, and the presence of alum adjuvant. Fluzone shows moderate reactogenicity, that may be linked to a residue of egg albumin and the inherent stimulatory capacity of influenza virus proteins; and finally, the purified HBsAg sub-unit vaccine of Recombivax has less potency. Interestingly, several inoculations of the Recombivax vaccine are normally required *in vivo*, to elicit protective immunity.

The LTE Module

The Lymphoid Tissue Equivalent (LTE) module has been designed to largely recapitulate human adaptive immune responses in the lymphoid tissues of the body. Although there are many cellular

Figure 5: A comparison of the specific immune response to tetanus vaccine, *in vivo*, and *in vitro* in the MIMIC System



Thirteen volunteers were vaccinated with a commercial tetanus vaccine. Blood samples from each individual were taken before and after vaccination.

a) The levels of tetanus-specific antibodies in the individuals' sera were determined by enzyme-linked immunosorbent assay (ELISA), pre and post-vaccination.

b) Peripheral blood mononuclear cells, purified from both the pre and post-vaccination blood samples of the individual donors, were simultaneously evaluated in the MIMIC System. The number of tetanus-specific antibody secreting cells, after 7 and 12 days of in vitro *culture, were determined by enzyme-linked immunosorbent spot (ELISpot) assay.*

■ = *pre vaccination;* ▒ = *post vaccination.*

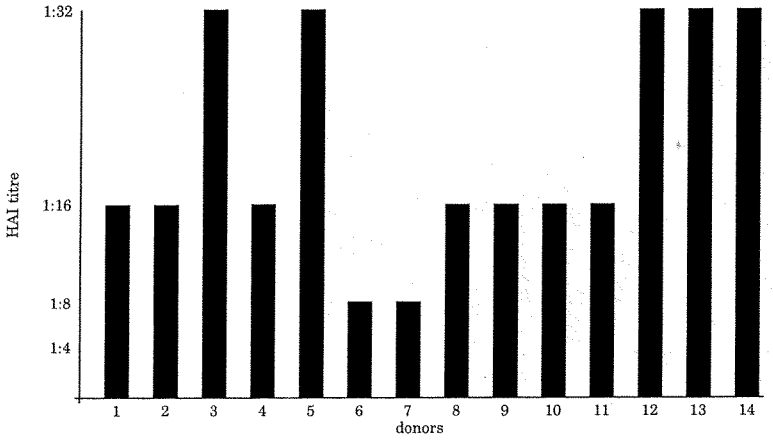
types within any given lymph node, the MIMIC system incorporates two-, three- and four-way interactions of the key immune cells (DCs, follicular dendritic cells, B-cells and T-cells). The application of these cells to the LTE is in sequential order, to mimic these immunologically-relevant responses, similar to what is known to occur *in vivo* (16). VaxDesign follows fundamental design observations, whereby the right cells ($CD4^+$ T-cells, B-cells, DCs, and follicular DCs) are placed together at the right time and in the right order, in an automatable, scalable, reproducible system to get the appropriate response (Moser, J.M., Sassano, E.R., Leistritz, D.C., Eatrides, J.M., Gaucher, D., Filali-Mouhim, A., Phogat, S., Koff, W., Sékaly, R-P., Haddad, E.K. & Drake, D.R. [2009]. *Dendritic cell-based assay for the in vitro priming of naïve human $CD4^+$ T cells.* Manuscript submitted).

As one example to validate the potential of this approach, we monitored the *in vitro*-generated tetanus toxoid (TT)-specific antibody levels in a cohort of donors before and after receiving tetanus vaccination. Purified CD4 T-cell and B-cell populations were combined with autologous tetanus vaccine-pulsed dendritic cells, to generate specific antibody. Enumeration of the TT-specific IgG antibody-secreting cells by enzyme-linked immunosorbent spot (ELISpot) assays displayed a significant increase in the magnitude of this population after vaccination. The relative magnitudes of the *in vitro*–generated TT-specific antibody response before and after vaccination, largely recapitulated the TT-specific IgG serum titre profiles measured in the same individuals, as shown in Figure 5 (17).

These findings provide evidence that the MIMIC System can be a rapid and representative *in vitro* method for measuring vaccine immunogenicity via induction of the memory B-cell response. In-house studies have clearly demonstrated that the use of purified lymphocyte populations and autologous DCs is more sensitive than bulk PBMC assays at generating both T-cell and B-cell immune responses (unpublished data).

Similar results have been obtained with other commercial vaccines, such as those for recall antigens (e.g. hepatitis B virus and influenza viruses),

Figure 6: Antibodies produced by the MIMIC System show effective neutralisation activity



Individual human donors' leucocytes were placed in the MIMIC System and stimulated with a commercial live-attentuated influenza vaccine. To test whether the antibodies produced by the B-cells in the MIMIC System are effective in neutralising the influenza virus they were tested, at serial dilution, in a standardised haemagglutination assay (HA). In this assay influenza virus particles cause agglutination of red blood cells (RBCs). Antibodies specific to influenza surface proteins will bind to the viral particles and will inhibit the haemagglutination. The greater the dilution of antibody-containing material, that still causes inhibition of agglutination, the greater the concentration of specific antibody. HAI = haemagglutination inhibition assay.

and primary response antigens, such as yellow fever virus.

Functional Assays

Functional assays are at the heart of the MIMIC System and determine whether the responses observed in previous modules of the MIMIC System are going to be effective against the original challenge material. For example, are the antibodies produced by B-cells effective at neutralising the original virus, as observed in the case for influenza (Figure 6), or do T-cell antigen-specific responses lead to an increase in cytokine production, cytolytic activity or overall proliferation? Cytotoxic T-cell assays examined CD107a and interferon-gamma (IFN-γ), both markers for cell killing.

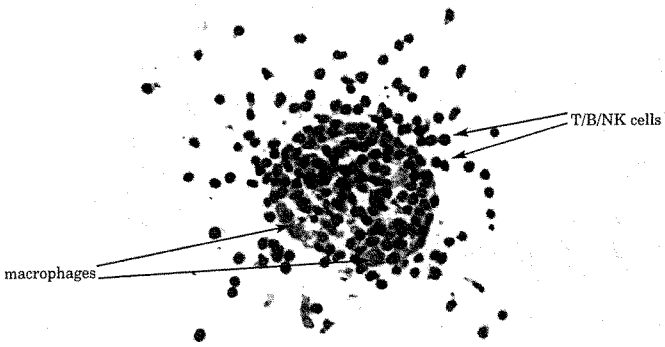
Since the MIMIC System can be re-stimulated *in vitro* many times, this is similar to the prime-boost scenarios used *in vivo*. This unique strategy allows for the possible application and testing of different primary and secondary stimulating antigen combinations to be delivered, all *in vitro*. $CD8^+$ T-cell responses have been observed in the MIMIC System, for both recall antigens (live-attenuated influenza vaccine) and for naïve antigens (live-attenuated yellow fever vaccine).

Disease modelling can also be performed with the MIMIC System. Tuberculosis (TB) is classified as one of the most devastating granulomatous diseases world-wide (18). The MIMIC System has been able to successfully recapitulate granuloma formation *in vitro*, and to drive *Mycobacterium tuberculosis* to latency. Histological analysis of the PTE module seeded with *M. tuberculosis* and PBMCs revealed spontaneous granuloma formation. Haematoxylin and eosin staining of sectioned PTE modules seeded with *M. tuberculosis* and PBMCs, clearly showed initial stages of granuloma formation in culture (Figure 7). In this disease module, new antibiotics can be tested to determine whether they are effective on latent TB and could lead to new therapeutic regimens. (Pawar *et al. An* in vitro *model of human tuberculosis granuloma and* Mycobacterium tuberculosis *latency*. Manuscript in preparation).

Automation

The MIMIC system has been streamlined and automated from beginning to end, by using a unique, reliable and robotic system to construct and test each component of this *in vitro* cell-based technology. Automation allows for precise fluid handling, consistency between wells and tests,

Figure 7: A cross-section of a MIMIC System PTE module seeded with *Mycobacterium tuberculosis*



A MIMIC PTE module was seeded with M. tuberculosis *and PBMCs. Examination of cross-sections, stained with haematoxylin and eosin, clearly showed the initial stages of granuloma formation. Macrophages, T-cells and B-cells, NK cells and fibroblasts are among the cells that aggregate to form the granuloma, with lymphocytes surrounding the infected macrophages. The MIMIC System has been able to recapitulate* in vivo *granuloma formation. This represents a novel disease model in which new antibiotics can be tested for efficacy against latent tuberculosis. PBMCs = peripheral blood mononuclear cells.*

from one donor's cells to another, and provides a rapid platform to accomplish a very high-throughput system in the most cost-efficient manner currently available.

Conclusions

The MIMIC System is a high-throughput, automated, *in vitro* modular technology, which is capable of examining individual human donor immune cell responses to many different compounds, such as vaccines, adjuvants, proteins, chemicals and drugs. Innate immune responses primarily are observed in the PTE module, with the capacity to mimic multiple mucosal surface types, as well as different antigen delivery sites. LTE responses recapitulate *in vivo* adaptive immune response with the right cells, at the appropriate time, and under appropriate conditions, to permit the production of effective antibody production and/or T-cell responses to vaccines, biologics, biologicals, or pathogens. Functional assays test these antibodies or T-cells for performance against the stimulating antigen. Many of these involve cytokine production, increased titres *in vitro*, viral neutralisation, or cytotoxic T-cell assays. The MIMIC System allows testing for a variety of demographic groupings, such as for HLA typing, gender or age biases, and geographic regional differences.

Acknowledgement

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October 4, 2011

Bruce Altevogt, Ph.D.
Study Director
Institute of Medicine Committee on the Use of
Chimpanzees in Biomedical and Behavioral Research
500 Fifth Street, NW
Washington, DC 20001

Sent by e-mail (baltevogt@nas.edu)

Dear Dr. Altevogt:

I am writing to report recent developments in the field of therapeutics for hepatitis C, that will be of interest to the Committee. In recent months, two new hepatitis C drugs have been approved for market by the Food and Drug Administration, and two others have shown particular promise in clinical trials. All four drugs have reached these stages without testing in chimpanzees. These drugs are Merck's Victrelis (bocepravir), Vertex's Incivek (telaprevir), Pharmasset's uracil nucleotide analog PSI-7977, and Bristol-Myers Squibb's NS5A inhibitor BMS-790052.

Victrelis and **Incivek** were approved by the FDA in May 2011 for combined use with peginterferon alfa and ribavirin. A search of FDA and PubMed records reveals that the development and testing of bocepravir was completed without the use of chimpanzees. In response to our inquiry, Vertex Chief Scientific Officer and Executive Vice President Peter Mueller, Ph.D. stated that "chimpanzees were not used in the development of Telaprevir." Dr. Mueller's letter is attached.

Pharmasset's PSI-7977 and **Bristol-Myers Squibb's BMS-790052** have completed successful phase II clinical trials demonstrating efficacy in the treatment of hepatitis C, and both drugs are advancing to later phase trials.

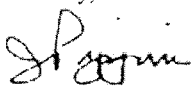
An inquiry to Pharmasset obtained a reply from Chief Scientific Officer Michael J. Otto, Ph.D., who stated: "In response to your e-mail and faxed letter, chimpanzees were not used in the development of PSI-7977. We do not use chimpanzees in our research or development and see no reason to change our approach." Dr. Otto's e-mail is attached.

A diligent literature search reveals that BMS-790052 has not been tested on chimpanzees. Inquiries to Bristol-Myers Squibb have not been answered.

Thus, both recently approved hepatitis C drugs and both new hepatitis C drugs showing particular promise in mid-stage clinical trials have been developed and tested without the use of chimpanzees. This is additional authoritative evidence that chimpanzees are not necessary to bring new effective hepatitis C drugs to the public.

We hope this information is useful for the Committee, and I would be pleased to answer questions or provide additional information at the Committee's request. Thank you for your ongoing careful consideration of the use of chimpanzees for biomedical and behavioral research.

Sincerely,



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Environment and Public Works Committee Hearing
(Held April 24, 2012)
Follow-Up Questions for Written Submission
Answers by Martin Wasserman, M.D., J.D.
June 19, 2012

From Sen. Boxer:

Q: Is it possible to drastically reduce the use of chimpanzees in medical research while allowing a few limited exceptions for medically necessary research consistent with the recent Institute of Medicine (I0M) recommendations?

The authors of the Institute of Medicine (IOM) report did not find a single area for which chimpanzee research is medically necessary.

The use of chimpanzees has decreased dramatically over the past several decades. Prior to the release of the IOM report last December only 10 to 20 percent of the total chimpanzee research population was being used in research protocols at any given time.

This is primarily due to three factors:

- An increase in effective alternative models that offer more reliable cost-efficient results;
- The exorbitant cost of using chimpanzees for research;
- The recognition, by researchers and others, that the use of chimpanzees is unethical.

Regarding the necessity of chimpanzees for biomedical research the IOM committee concluded that "...most current use of chimpanzees for biomedical research is unnecessary," based on the criteria established by the committee. There were two areas of research that the committee honed in on:

- "Development of future monoclonal antibody therapies will not require the chimpanzee, due to currently available technologies. However, there may be a limited number of monoclonal antibodies already in the developmental pipeline that may require the continued use of chimpanzees."[1]

  The three-year phase-out of chimpanzee experiments written into the Great Ape Protection and Cost Savings Act (S. 810) will provide for the completion of those studies.

[1] IOM report page 67.

- In regard to a hepatitis C virus (HCV) vaccine:

  i. "The committee was evenly split and unable to reach consensus on the necessity of the chimpanzee for the development of a prophylactic HCV vaccine. Specifically, the committee could not reach agreement on whether a preclinical challenge study using the chimpanzee model was necessary and if or how much the chimpanzee model would accelerate or improve prophylactic vaccine development."[2]

  ii. The report further stated that, "It is important to note that there was consensus among the committee that human trials of candidate vaccines could be designed and performed ethically without data from chimpanzee research."[3] Therefore, chimpanzees are unnecessary in HCV vaccine development.

- In regard to a new or emerging disease or disorder an amendment could be added to S. 810 that would provide for the use of chimpanzees in the unlikely circumstance that they are found scientifically necessary.

Regarding the necessity of the chimpanzee for comparative genomics and behavioral research the committee did not find that chimpanzees *are* necessary only that chimpanzees *may be* necessary. Fortunately, behavior and genomics research can be accomplished using noninvasive research techniques and stored biological samples, all of which is permitted under the proposed Great Ape Protection and Cost Savings Act. Further, chimpanzees do not need to be maintained in laboratories in order to conduct this type of research.

Additionally, the committee stated that all chimpanzees used in biomedical, genomic, and behavioral research "must be maintained in either ethologically appropriate physical and social environments or in natural habitats." No existing laboratory facilities have ethologically appropriate housing and none of them meet the complex social and emotional needs of chimpanzees. North American Primate Sanctuary Alliance (NAPSA) member sanctuaries such as Chimp Haven provide ethologically appropriate physical and social environments as required by the IOM report and can meet the complex needs of chimpanzees at a lower cost to NIH and taxpayers.

In conclusion, it is not necessary to maintain chimpanzees for any current medical research and further not possible to maintain them in accordance to the ethologically appropriate housing requirements outlined in the IOM report. It would be absurd to build housing to maintain any number of chimpanzees in

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[2] Ibid.
[3] IOM report page 55.

research laboratories, both from a scientific need perspective and a fiscally accountable one. I suggest implementing a full phase out and ban; in the extremely unlikely circumstances of a future need arising with scientific evidence that chimpanzee data could bring about a breakthrough for a new disease, bringing some chimpanzees back into research through the inclusion of a focused and specific contingency clause. But again, this is a highly unlikely circumstance.

Q: What benefits can we expect from reducing the use of chimpanzees in medical research?

By passing S. 810 and phasing out expensive and unnecessary chimpanzee experiments, tens of millions in federal dollars can either be saved each year or used to conduct more efficacious research that benefits human health. I recommend that NIH fund research using superior, advanced human relevant technologies that offer accurate results and improve human health.

We have already seen the benefits of using non-chimpanzee research methods. For example, prior to the IOM report, chimpanzees were touted as the only model for hepatitis C research, yet the committee did not find one area of hepatitis C research for which chimpanzees are essential. Alternative models are available and are being used in all areas of hepatitis C research. In 2011, the Food and Drug Administration approved two new therapeutics for HCV—the first in decades. Both were developed and tested without the use of chimpanzees, and additional HCV therapies that used alternative models are in the pipeline.

Currently, millions of taxpayer dollars are being wasted on the warehousing of chimpanzees who are not being used in research protocols. One-third of the federally-owned chimpanzee population, housed at the Alamogordo Primate Facility, has not been used in research for more than 10 years. Yet the housing and maintenance of those chimpanzees has cost taxpayers millions of dollars, with the maintenance of each animal costing $66 per day.

While the IOM report did not make any assessment of the financial costs of using chimpanzees, it concluded that the "development of non-chimpanzee models requires continued support by the National Institutes of Health."[4]

In conclusion, federal dollars saved by phasing out chimpanzee research and retiring federally-owned chimpanzees could be used towards the development of superior technologies and research of value.

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[4] IOM report page 67.

From Sen. Cardin

Thank you for your testimony. You have testified that ending much great apes research is necessary and appropriate, but that there is room to modify S. 810 as currently written to bring it more in line with the Institute of Medicine report, which concludes that a blanket ban on testing would be inappropriate.

Q: Are the Institute of Medicine criteria appropriate for evaluating chimpanzee research?

The Institute of Medicine report did not conclude that a ban on chimpanzee experimentation would be inappropriate. In fact, after stating that chimpanzees have been previously used to obtain scientific information the report stated that "the past is not necessarily prelude."[5] In addition, the committee recognized that "the limited number of available animals and the potential need to perform experiments under conditions of biocontainment could potentially constrain the value of the chimpanzee during a public health emergency."[6]

Nonetheless, the report did not fully close the door to the possibility of needing chimpanzees in the future. However I would support an amendment to this S. 810 that would allow for the use of chimpanzees in the event of an unexpected outbreak of a new and life-threatening disease – if there is scientific evidence that no alternatives to the chimpanzee exist – that demonstrates that the use of chimpanzees is scientifically warranted, and that the process is as transparent as possible.

However, the IOM criteria fell short of what must be considered when evaluating the use of chimpanzees in research. The committee was charged with evaluating the scientific necessity of using chimpanzees, while "neither the cost of using chimpanzees in research nor the ethical implications of that use were specifically in the committee's charge."[7] I would submit that the financial costs of using chimpanzees, particularly in light of the current national economy, and the ethical implications of their use cannot be overlooked.

Additionally, the committee stated that all chimpanzees used in biomedical, genomic, and behavioral research "must be maintained in either ethologically appropriate physical and social environments or in natural habitats." Further, the committee stated that "All [genomics and behavioral] experiments are performed on acquiescent animals…" It is critical that "ethologically appropriate" and

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[5] IOM report page 65.
[6] Ibid.
[7] IOM report page 14.

"acquiescent" be defined clearly if the IOM's criteria are to be implemented correctly.

Existing laboratory facilities are not ethologically appropriate and cannot meet the complex social and emotional needs of chimpanzees. Housing chimpanzees individually or in small social groups in concrete runs or primadomes is inappropriate. North American Primate Sanctuary Alliance (NAPSA) member sanctuaries such as Chimp Haven provide ethologically appropriate physical and social environments as required by the IOM report and can meet the complex needs of chimpanzees at a lower cost to NIH and taxpayers.

To suggest that genomic and behavioral experiments could be performed on "acquiescent" chimpanzees introduces a notion of implied informed consent that is unrealistic and implausible in this context and for this species.

Further, the third criterion set forth by the committee ("[f]orgoing the use of chimpanzees for the research in question will significantly slow or prevent important advancements to prevent, control, and/or treat life-threatening or debilitating conditions") is problematic. The only way to attempt to meet this criterion would be to conduct the actual research first, and even then, a determination of whether this criterion is met, is subjective at best. This is the very reason why the committee was split and unable to reach a consensus on the necessity of the chimpanzee for the development of a prophylactic HCV vaccine – because the application of these criteria is anything but a black and white issue.

We will never know if not using chimpanzees in past biomedical research would have harmed biomedical research, or instead, would have led us down alternative paths with more effective results. There is no evidence that any restrictions in research have ever harmed biomedical progress. However, when scientists are pressed to justify why they want or need to do what they propose, the result is commonly much better science.

In conclusion, the IOM criteria alone are not appropriate for evaluating current or future chimpanzee research. The terms ethologically appropriate and acquiescent must be clearly and accurately defined while the financial burden on tax payers and ethical implications must be scrutinized if the use of chimpanzees is going to be considered in the event of an unexpected outbreak of a new and life-threatening disease. Additionally, application of the third criterion can be difficult and will not necessarily provide definitive answers, as evidenced by the committee in its evaluation of the necessity of the use of chimpanzees for the development of a prophylactic hepatitis c vaccine.

Q: Did the Institute of Medicine accurately capture the potential limitations of a blanket ban on chimpanzee research? Please elaborate.

The Institute of Medicine report stated: "The committee cannot predict or forecast the future need of the chimpanzee animal model and encourages use of the criteria established in this report when assessing the potential necessity of chimpanzees for future research uses."[8] The contingency clause proposed as an amendment to S. 810 addresses this issue by clearly allowing for the use of chimpanzees in the face of a human health emergency as long as it is scientifically proven that such use of chimpanzees would yield a breakthrough and the circumstances meet the IOM report criteria.

[8] IOM report page 66.

From Sen. Sessions:

Q: Do you agree that the Institute of Medicine has stated that the federal government should not close the door on chimpanzee research at this time?

The Great Ape Protection and Cost Savings Act (S. 810) is a three-year phase out of the use of chimpanzees in invasive research, therefore allowing the continuation and finalization of any invasive studies currently underway. Additionally, the bill does allow for certain research, such as noninvasive studies. *It is important to point out that the Institute of Medicine (IOM) could not identify any current area of biomedical research for which chimpanzee use is necessary.* The IOM committee did suggest making chimpanzees available for a future biomedical use that is not known at this time, but that "[t]he present trajectory indicates a decreasing scientific need for chimpanzee studies due to the emergence of non-chimpanzee models and technologies."[9]

The IOM concluded that chimpanzees aren't necessary for the study of a wide range of diseases, including HIV, RSV, malaria, antivirals and therapeutic vaccines to treat hepatitis C. There were two areas of research flagged by the committee: monoclonal antibodies and efficacy testing of a prophylactic (preventative) hepatitis C vaccine. In regard to monoclonal antibodies, the committee made it clear that chimpanzees will not be needed for future monoclonal antibodies research, but that some currently in the development pipeline **may** require the use of the chimpanzee until the studies are completed. Discussions with the committee clarified that the timeline for this is no longer than three years and, importantly, the Great Ape Protection and Cost Savings Act is a three-year phase out. Further, the committee was evenly split as to whether chimpanzees are necessary for efficacy testing of a prophylactic Hepatitis C vaccine—so did not draw a definitive conclusion as to necessity in either of these areas of research. There are a number of alternatives currently in use for this area of research, and additional alternatives are also under development that will likely be completed in the near future.

In regard to future use, representatives from the Department of Defense and the National Institutes of Health have stated that the chimpanzee model would not be appropriate for time sensitive research necessary in an emergency human health crisis. It often takes a significant period of time for diseases or conditions to develop in the chimpanzee model, largely due to their immunological differences from humans.

Dedicating resources into keeping chimpanzees in laboratories, who are not likely to be needed in future research, takes away resources from areas of research that need support now. Limited resources would be better invested in the development

[9] IOM report page 5.

of alternative research methods which could provide a wider range of uses and benefits. For example, VaxDesign's MIMIC (Modular Immune In Vitro Construct) could be used to test a wide range of vaccines using human immune cells. When a chimpanzee is infected with a disease, the chimpanzee could live with that disease for up to 60 years (even if it appears that the chimpanzee has cleared the virus, it may be present in cells without detection) and it will not be known how that disease may impact infection with any other diseases or the study of pharmaceuticals. In other words, an infected chimpanzee can live for 60 years with very limited utility, whereas a system such as MIMIC, allows for research of a wide range of diseases on human cells over that same period of time, thus saving time, money and ultimately lives by getting therapeutics to the market much quicker.

While I don't believe that chimpanzees are necessary in invasive research, I would support an amendment to this legislation that would allow for the use of chimpanzees in the event of an unexpected outbreak of a new and life-threatening disease – if there is scientific evidence that no alternatives to the chimpanzee exist – that demonstrates that the use of chimpanzees is scientifically warranted, and that the process is as transparent as possible.

Q: Would S. 810 essentially ban medical research on chimpanzees?

The legislation would phase out the invasive use of chimpanzees in research over three years however researchers could still conduct noninvasive research on chimpanzees that could help to advance medical knowledge, such as noninvasive behavioral and genetic research. Importantly, chimpanzees do not need to be kept in laboratories in labs for these types of research. Emerging disease research conducted on wild populations (such as collection of fecal and hair samples) is a more effective way of identifying emerging diseases and learning of the origins of existing diseases. For example, information about HIV can be determined by collecting fecal samples of wild chimpanzees.

Q: The federal government needs to examine all possible options for reducing expenditures. If S.810 were enacted into law, and if the chimpanzees currently in federally-funded research facilities were transferred to sanctuaries, would new sanctuary facilities need to be built in order to house and care for the chimpanzees NIH currently supports? How much would those efforts cost, and who would cover those costs?

A white paper on the economics of this bill is attached, which lays out all of the taxpayer savings related to the passage of this bill. This legislation can save the federal government approximately $25 million annually. The bulk of the savings would come from ending invasive and unnecessary research. However, there are also significant savings related to the retirement of federally-owned chimpanzees in sanctuaries, despite the fact that the federal sanctuary system is legally required to follow higher standards of care than the laboratories.

The IOM report stated that chimpanzees should be housed in ethologically appropriate environments. There is not one chimpanzee laboratory to date that has ethologically appropriate housing. So, in order to be IOM compliant, massive investments would need to be made in laboratory construction, which would be unworkable due to space limitations and absurd to pursue for a population of no use in research. These investments are in addition to the already higher cost of maintenance in laboratories compared to sanctuaries.

Conversely, the attached white paper details how expected construction costs at sanctuary would eventually be offset due to the lower cost of care at sanctuaries, versus maintaining them in laboratories.

It is important to note that Chimp Haven--the national chimpanzee sanctuary which currently holds the government contract to care for federally-owned chimpanzees who are retired from research--has created plans to take in another 300 chimpanzees and is willing to work towards plans to take in as many as 900; almost the entire laboratory population. Therefore, it would not be necessary for new sanctuaries to be built but rather existing facilities could be expanded.

Another potential option is to retire the chimpanzees at the Alamogordo Primate Facility (Alamogordo, NM) "in place" and have a non-profit sanctuary take over management of the property. However, with this option, it will be critical for a nonprofit to manage the site due to the fact that a nonprofit does not function to earn a profit, as the current contractor at the site does. Further, nonprofits also have much lower indirect costs in comparison to the current laboratories, which is as high as 70 percent at some facilities. Moreover, the mission of a sanctuary is focused entirely on the well-being of the chimpanzees. The Alamogordo Primate Facility would likely require some renovations but, if it is a viable option, could even further increase the savings of the bill over the current projections provided in the white paper.

Federal government budget savings from defunding invasive research on chimpanzees and retiring government-owned laboratory chimpanzees to sanctuary

This report was commissioned by The Humane Society of the United States and prepared by Carl V Phillips, PhD. Dr. Phillips is an economist and epidemiologist specializing in assessment of complex bodies of data. He was professor of public health and medicine, most recently at the University of Alberta and previously at the University of Texas, teaching courses for 15 years on quantitative analysis of public policy decision making. He currently runs a private consultancy, focusing on regulation of the use of animals, as well as alternative strategies for reducing the health effects from smoking, and other areas of public health policy.

7 June 2012

Abstract

Research on chimpanzees is heavily funded by the National Institutes of Health (NIH). A proposed bill, the Great Ape Protection and Cost Savings Act (S. 810 / H.R. 1513), would prohibit all invasive research on chimpanzees and retire federally-owned chimpanzees to sanctuaries. While calls for such legislation are substantially motivated by ethical concerns and questions about the usefulness of the research, the bill also offers substantial cost savings for the federal government. A conservative estimate puts the total annual savings at almost $20 million, and it could be as large as $25 million. Ending the use of chimpanzees in federally-funded invasive research would save $15-20 million annually, even allowing for some alternative research to take its place. Retiring chimpanzees who are now housed in laboratories to sanctuaries would also be cost saving in itself. Additional savings could be found in ending subsidies for privately-owned chimpanzees and reduced future lab expenditures.

Background and Overview

Health science research using chimpanzees as models for human health effects is ethically controversial. Despite those concerns, the U.S. government currently funds invasive (physically or psychologically damaging) research on a few chimpanzees, as well as the maintenance of hundreds more in government-funded laboratory facilities, even though they are not being used in any active research and haven't been for over a decade. This situation would present a dilemma if current situation represented a cost-effective method for health research or for housing the captive chimpanzees.

However, research on chimpanzees turns out to be very expensive compared to other methods of pursuing the same research questions, while housing them in labs is considerably more expensive than moving them to more suitable facilities. Recent analysis, most notably a report from a panel convened by the Institute of Medicine (IOM) (iom.edu/Activities/Research/Chimpanzees.aspx), argues that due to advancing competing technologies, most invasive chimpanzee research is already obsolete as a method of understanding human health, and the rest will be soon.

In light of those observations, the U.S. Congress is currently considering a bill, the Great Ape Protection and Cost Savings Act (S. 810 / H.R. 1513), that would:

- prohibit invasive research on chimpanzees and end federal funding for such research
- retire to sanctuaries all federally-owned chimpanzees who are currently housed in research labs
- prohibit the breeding of additional chimpanzees for research

In addition, since the bill would end NIH's support of invasive research on chimpanzees and laboratory housing for government-owned chimps, most assessments predict that it would also indirectly:

- end the current NIH funding for the housing and care of privately owned chimpanzees

The present analysis estimates the federal government budget savings that would result from this legislation. For purposes of the budget analysis, the ethical concerns can be set aside and it can be seen as similar to any analysis of cost savings from phasing out obsolete and inefficient

materials and procedures. As with many such situations, it is useful to keep in mind the political economy concepts of principal-agent theory and agency capture. Government employees, contractors, and grant recipients conducting research would ideally act as perfect agents, doing what is optimal for their principals, the American people. But principal-agent theory points out that agents generally have somewhat different incentives than their principals. As is often the case, the agents have become specialists in doing particular things in particular way, and stick with that even when this is no longer in their principal's best interest. Moreover, decision-making processes are often "captured" by those who have the greatest financial interest, often to the detriment of the people as a whole.

In the present case, continued use of chimpanzees in invasive research and housing in labs can be seen a serving the interests of the agents more than the principals. But since the decision makers (about research grants and such) are among those who benefit from the status quo, there is not likely to be a natural transition to alternative research methods without action like the proposed legislation. Without such an intervention, the current practices of research and housing are likely to be self-perpetuating despite the available budgetary savings and other arguments in favor of change.

The case that the proposed defunding would unquestionably result in budgetary savings is quite easy to make. Eliminating federal funding for invasive chimpanzee research and prohibiting the breeding of additional chimpanzees for research would self-evidently result in cost savings, as would the ending the current NIH funding for the housing and care of privately owned chimpanzees, assuming it occurs as predicted. Moving the chimpanzees from labs to sanctuaries would also generate large savings because, as shown in the analysis below, sanctuary housing is much less expensive than the costs estimated for labs.

While precise quantification of the savings is not possible for reasons discussed below, the savings for the proposed policy can be conservatively estimated at about $20 million per year, and could be as high as $25 million. Individual components of that estimate appear in Table 1 and the analysis for each follows.

Federal government spending on chimpanzee research and housing

Federal expenditures on research chimpanzees include:

- Housing and care for over 450 chimpanzees in four laboratories which are privately owned and operated, but receive significant federal funds.
    - (Alamogordo Primate Facility, New Mexico (172 chimpanzees based on the last official report)
    - New Iberia Research Center, Louisiana (117)
    - MD Anderson Cancer Center, Texas (154)
    - Southwest National Primate Research Center, Texas (25)
- Subsidies which support over 200 privately-owned research chimpanzees at these labs
- Invasive research, funded by grants on a project-by-project basis.
- Non-invasive research, funded by grants on a project-by-project basis.
- A breeding program and possible future capital expenditures on the research lab facilities.
- Housing for 115 (at current count) government-owned chimpanzees at Chimp Haven, a sanctuary for retired research chimpanzees as well as chimpanzees formerly used in entertainment or the pet trade, a private entity that holds a contract with the government to care for retired, government-owned chimpanzees and receives more than 75% of its funding from the government through a private/public partnership.

Quantifying the exact savings from the legislation is challenging because payments in support of these activities are spread across numerous research grants and other budget items, and many of those funding items combine spending on housing and research, or include some activities that would be prohibited along with non-invasive research that could continue. There is no official tally of the total cost, nor even a listing of all of the sources of spending on research chimpanzees. Official estimates exist for housing costs, but as noted below, they are clearly incorrect.

Given the ambiguities in the available data, there is little hope of providing estimates of the savings that are better than ±10%, and ±20% is probably a more realistic goal. No one who understands the uncertainty surrounding the question would claim that much more precision is possible. However, that level of uncertainty is still sufficiently precise to demonstrate that there would be substantial savings.

Cost of federally-funded invasive research

Grant funding information from NIH is available to the public via the RePORTER data portal (accessible via projectreporter.nih.gov/reporter.cf). All government funding for the laboratory housing and all federally-funded health and behavioral research on captive chimpanzees falls under NIH (assuming there are no programs that are not publicly reported). The Centers for Disease Control and Prevention (CDC) had a chimpanzee research program, but returned their animals to New Iberia Research Center ownership in 2009, where they are supported by NIH through endowments and leasing fees. It is possible that the military and other government agencies engage in some form of chimpanzee research, though the Department of Defense denied having such a program at a recent IOM meeting. If such research does exist, however, that is difficult to assess and it might be subject to entirely different considerations, and so is not considered in this analysis.

A search (using keywords for variants of "chimpanzee", followed by manually reviewing the content each record to assess which category it falls into) of the RePORTER data for grants paid in FY2011 finds the following:

- There were approximately 30 projects with total funding of about $12 million for invasive research that would have been prohibited under the new proposal.
- A similar number of additional projects, funded for approximately $13 million, included invasive chimpanzee research as one of several components.

If all of these had been eliminated, the savings in 2011 would have been $25 million. A more conservative estimate allows for the non-chimpanzee (probably less expensive) parts of the research in the second category to have been done, for a reduction in the range of $20 million.

The uncertainty of these estimates represents the difficulty in determining, from the published information, how much some projects depend on invasive chimpanzee research, and in some cases whether they involve it at all (either because they are borderline for the definition in the proposed bill or because they do not clearly report what they will do to the animals). Some of the abstracts are so vague that it is impossible for the reader to be certain whether chimpanzees or other apes were even being used, though their genus name appears in the keywords. In other cases, the authors do not clearly state what is being done to living animals, as opposed to genetic material or cell lines. This could be the inadvertent result of jargon and attempts to be terse, but the obfuscation seems to exceed what is typical even for technical

medical research, and so it is difficult to not perceive it as intentional. Research proposals involving human subjects generally state quite clearly what is being done to how many people. But in the case of the chimpanzee research proposals, experiments that look at viral infections are often described in terms of genetics and tissue, and it is unclear whether live chimpanzees are involved; work that is described in terms of animal behavior is often really focused on exploring what can be done with scanning equipment and thus involves sedation and restraint of the animals.

Most of the grants fund periods of approximately one year; however, to the extent that they fund longer periods, the future carryover from them will be approximately balanced by carryover into 2011 from previous years' allocations. Thus, the figures serve as an estimate for one year's expenditure or one year's commitment.

It is likely that the expenditure on chimpanzee research would trend downward, even in the absence of significant restrictions, for the same reasons that this legislation is being considered. However, it seems unlikely that there would be large reductions anytime soon. Most of this research is being carried out by a small number of researchers and institutions that either run the labs or have close ties to them, the actors referred to above in the context of principle-agent and capture theory. Thus, the 2011 expenditure offers a good estimate for projected annual spending, in real dollars, for the medium-term.

Presumably a portion of the research that would be prohibited would be replaced by other research methods, reducing the savings. However, that portion appears to be quite small. Very little, if any, of the chimpanzee research seems to be motivated by trying to answer a specific critical question, which would be the circumstances that would require an alternative method to be substituted. Moreover, to the extent that the general questions being explored are important, the useful research using (probably cheaper) alternative methods would have already been funded as part of that important pursuit. Put another way, we are aware of no evidence that there are any potential research projects that have not been funded based on the assessment, "this would be worth doing if we did not have chimpanzee research, but since we are doing the chimpanzee research, this does not need to be funded." Nevertheless, a conservative estimate requires allowing for some replacement of the research that would cease, though well under 10% of the total.

In addition it appears that some of the cost of housing and care of the chimpanzees is hidden in these research grants. To avoid double counting, this should be removed from the cost of research. However, because it is hidden, the appropriate reduction can only be estimated based on the apparent underestimate of the cost of care at some facilities (see the analysis in the following section). On this basis, and allowing for a contribution from the behavioral research that would not be banned, it appears that up to 10% of the research grant funds are used to cover housing and care.

Based on this analysis, we can conservatively estimate that the elimination of this invasive research (excluding housing and care costs) would result in a savings of more than $15 million annually, and the figure could conceivably be as high as $20 million.

Estimated current costs of housing

The costs of housing are summarized in Table 2, and the supporting analysis appears in this section and the following section.

The FY2011 NIH allocations for the housing and care of chimpanzees living in labs, as reported in RePORTER, was $17 million. It would be a misleading overestimate to call this the average annual cost, however, because FY2011 expenditures happened to include a greater than average amount of funding for future years. However, NIH's own published estimates (grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm) are equally misleading, with a bias toward underestimate. It is possible to use the available data to provide a realistic estimate that falls in between.

The NIH's estimates for the cost of housing and care vary across labs by a factor of 3 (on a per-chimpanzee per-day basis, hereafter denoted "per chimp×day"). Even within a single facility, the Southwest National Primate Research Center, the costs reported for two different groups of chimpanzees (covered by different funding streams) vary by a factor of 2.5. It is not plausible that these differences reflect genuine variations in costs, yet the NIH simply averaged the numbers together without attempting to explain the discrepancy.

A closer examination shows that something close to the high end of NIH's reports range is the best estimate. At the high end is $67 per chimp×day at the Alamogordo Primate Facility, with its 172 chimpanzees, more government-owned chimpanzees than live in any other facility. This facility is unique in that none of the chimpanzees there are currently used in research; they are designated as "research reserve". At other facilities, research grant funding -- the invasive research quantified above, as well as another $5-10 million annually for non-invasive research -- apparently covers some of the cost. The $67 figure is too high, however; NIH bases it on the 2011 allocation of $4.2 million/year, but that is from a contract with a front-loaded payment; the average for the contract, which includes extensions through 2014, is only $3.9 million/year. This lowers the total to $62.50 per chimp×day, assuming no change in the population.

The fact that it averages to exactly this round number strongly suggests that this per-day number was the basis for the contract amount. Since this was a contract for just the housing and care of chimpanzees, this seems to be the revealed NIH estimate of the true cost when there are no hidden subsidies. (There are likely some additional performance incentives promised to the contractor since there were in the previous contract. But, the figures were redacted from the public version of the previous contract and it is not known what appears in the current one. If there are substantial incentives, they make the estimate used in this report even more conservative.)

This figure is comparable to the higher of the two numbers for Southwest National Primate Research Center at $56 per chimp×day; it is substantially larger than the figure for MD Anderson, $46, but not completely out of line. The other two figures presented ($29 at New Iberia Research Center and $22 for a population of chimpanzees at Southwest that are described as owned by the lab but supported by NIH) are simply not plausible estimates of the full costs of care. The former may represent substandard care, since New Iberia Research Center settled with the U.S. Department of Agriculture (USDA) for Animal Welfare Act violations in 2010 and is currently under investigation by USDA for additional alleged violations. The latter presumably represents a partial subsidy rather than full costs. All the figures that are lower than the Alamogordo Primate Facility grant probably result from some support for housing and care in research grants, as well as intentional or unintentional cross-subsidization from other lab activities or other hidden budget items. The primate labs house other species that are much less expensive than chimpanzees, and the low numbers might be explained by cross-subsidies or even averaging some costs across the entire population of different species.

Conservatively rounding the $62.50 per chimp×day down to an average of $60 based on the possibility that the lower figures at other facilities genuinely reflect somewhat lower costs, and counting the most recently reported population, the ongoing cost of care for chimpanzees in labs is $13 million/year.

Comparative cost of alternative housing

Chimp Haven currently serves as the home for research chimpanzees retired from federal research, currently housing 115 of them (in addition to another 14 that were privately owned and are privately supported). It receives most of its funding from a federal contract that covers 75% of operating costs and 90% of construction related to the government owned chimpanzees, with private donations providing the balance of those costs. Other chimpanzee sanctuaries exist, and at least one appears to have slightly lower operating costs, but because Chimp Haven already has federal funding, and budget numbers are available, this analysis is based only on that facility; if other facilities offer additional options, that could further increase the cost savings.

Chimp Haven's most recent annual report (for 2010) shows receipt of government funds that average to $42 per chimp×day, based on a count of 122 government-owned chimpanzees retired from research (chimphaven.org/news/annual-report-archive/), though because 16 animals were added at some point during that year, a more conservative estimate is $44 for an average population of 116. The aforementioned NIH published estimates put the figure at $47, but that is inexplicably based on only three selected months of the 2011 budget. Even the $44 figure may be an overestimate, since it is larger than Chimp Haven's current reported costs (see below) and is more than 75% of the total spent on chimpanzee care, and so may reflect some one-off expenditures (e.g., they report building a new veterinary clinic that year).

Chimp Haven is required to provide a higher standard of care in comparison to the laboratories in terms of both health and social environments (as per 42 CFR, Part 9: Standards of Care for Chimpanzees Held in the Federally Supported Chimpanzee Sanctuary System). Even after adding the private donations, this costs somewhat less than the estimated cost of lab housing, and once the private donations are considered, the budgetary savings is substantial. This combination of higher quality and lower cost should not be surprising since Chimp Haven is

purpose-built for providing care, while the labs are built to facilitate the use of animals in research and managed and staffed accordingly.

Based on these numbers and the calculated costs of lab housing, keeping the government-supported chimpanzees at Chimp Haven rather than in a government-supported lab saved about $0.7 million in 2010.

It is not the past costs that determine the cost savings, however, but what the costs are after increasing the population, and the projections show that the savings increase substantially.

Chimp Haven reports that it currently houses retired government chimpanzees for about $39 per chimp×day in government payments ($52 total), with an average cost for the 15 privately retired chimpanzees that is a third lower due to the additional management staff required by the NIH contract (these and the following input figures based on growth projections recently calculated by Chimp Haven and provided by request to The HSUS.). The reason for this difference between these figures and the 2010 report are not clear; it might be increasing efficiency or the misleading inclusion of one-off costs in the 2010 analysis. In any case, this lower average cost for the current population, by itself, represents an increase in federal cost savings compared to lab housing of about one-third.

The Chimp Haven report also shows that the facility is and has been operating substantially below its physical capacity. There would be major economies of scale for adding the next 50 chimpanzees and substantial economies of scale for up to double the current population. Average costs per chimpanzee are projected to drop by about 20% as the population doubles and current overcapacity is used, increasing to 25% as expansion continues and other economies of scale are realized.

Specifically, the marginal cost of the next 100 chimpanzees added will be only about half the current average. Thus, moving another 100 federally-funded chimps is predicted to increase the federal budget savings compared to lab housing by about $1.3 million annually (this does not include the savings already realized from the current Chimp Haven population).

Chimp Haven has a plan for its physical space that would increase capacity to 425 chimpanzees, with the possibility of housing about 25% more with a change in configuration.

This would require $23 million in capital expenditures (the federal government would pay 90% of that, based on the current contract), about one third of which would be for the expanded quarantine facility that would be needed for the transfer of large numbers from lab settings. Over that range, there are some additional economies of scale (beyond the 20% reduction already mentioned). Considering the projected capital and operating costs compared to the estimated cost of lab housing, this puts the break-even point at housing an additional 200 chimpanzees at Chimp Haven -- beyond the aforementioned doubling that comes with substantial economies of scale -- at about 9 years. (This is based on real dollars and current labor costs, and with no discounting of out-years for comparison to capital costs which is appropriate due to the federal government's current zero-interest-rate cost of borrowing.)

Given the life expectancy of chimpanzees, over 20 more years on average for the current lab population, this represents further budgetary savings, though the exact quantification depends on the exact life expectancies of the chimpanzees and the discount rate used for the savings in out-years, since it involves operating cost savings offsetting a capital expenditure.

To the extent that the currently-planned expansion is inadequate to cover a complete transfer of the lab population, Chimp Haven or another facility would need to expand further; the only basis for estimating that cost is to extrapolate the current Chimp Haven expansion plan. Based on that, there would continue to be a modest net savings as the transfer scales up.

It is possible that the private donations that cover 25% of operating costs might not scale up to cover the entire research chimpanzee population, though Chimp Haven's projections are based on the assumption that they will. However, even if there were no donations, the sanctuary housing would represent a budgetary savings compared to labs, and the additional capital cost would more than break even over the chimpanzees' lifetimes. To the extent that donations fall short, the net budgetary savings would need to be adjusted downward.

An option that has been suggested is conversion of the Alamogordo Primate Facility to a retirement sanctuary for the 172 chimpanzees currently housed there. This would increase the salvage value and might lower the average costs of the retirement. Since this is currently speculative and has not been formally assessed, all that can be said about it is that if it turned out to be a suitable and less costly option, it would further increase the federal savings on housing costs.

Other avoided costs: capital expenditures on laboratories and breeding program

The expenditure to build existing lab facilities for housing chimpanzees is sunk, though there would presumably be some salvage value for the equipment and alternative uses of building space. However, there have been suggestions of multi-million dollar expenditures for further construction. While we are aware of no approval of any such funding and it is unclear whether there are any official proposals at this time, it seems impossible to maintain the lab housing for the rest of the chimpanzees' lives without substantial capital spending, particularly in light of concerns about the quality of care. Thus, the capital expense of expanding Chimp Haven or some suitable alternative is at least partially offset by reduced capital spending at the labs.

Neither NIH nor the labs seem to report projected equipment replacement needs or other data that could be used to estimate the capital expenditures that would be required to keep the chimpanzees in the labs well into the 2030s. While optimal accounting calls for building such needs into annual budgets via depreciation charges, the more typical practice in contexts like this is to ignore facility degradation and inadequacies until a large one-off expenditure is needed to solve a crisis. Thus, we have no basis for estimating the avoided capital expenditures. Estimating the salvage value might be possible, but has not been attempted. Given the figures that have appeared in recent, albeit unofficial, discussions of spending, it seems likely that the average annual cost would be in the mid-six-figure range over 20 years, less than the cost of building at Chimp Haven, but substantial.

Though there is a moratorium on breeding new government-controlled chimpanzees, New Iberia has an ongoing contract with NIH for about $1 million/year to breed new chimpanzees for use by NIH researchers. Chimpanzee researchers have pointed out that the lab chimpanzee population is aging and estimated that a breeding program to keep it stable would cost $9.5 million per year (dpcpsi.nih.gov/orip/documents/ChimP05-22-2007.pdf). While there is little chance that this would occur, even if it were not prohibited, if current research is allowed to continue then there will be pressure to replace at least some of the population. Private contracts and ownership could be used, but if there were still a federal research program, this would likely be supported by federal subsidies in one way or another.

Subsidies for housing and care of privately-owned chimpanzees

There are approximately 200 privately-owned chimpanzees housed at the Yerkes and Southwest facilities, and the federal government pays some of their costs. The amount of these subsidies are buried in the huge budgets of these facilities (which house animals other than chimpanzees), and we have not been able to uncover a definitive documentation or even estimate. Because the subsidy need not cover the entire cost, it could conceivably be any portion of the approximately $60 per chimp×day total cost.

Some rough estimates of the costs of these subsidies have been extracted from statements to the press (there is no official reporting), but it seems that the best we can realistically do is offer a conservative hypothetical: If future subsidies were merely half of the total cost, $30 per chimp×day, the annual federal cost would be about $2 million annually. Under the proposed bill, the private owners are not required to retire the animals and the federal government would not be required to end subsidies. But with lab housing of the government chimpanzees and invasive research ended, the ending of subsidies seems likely. Since the costs at sanctuaries are lower than those in labs, presumably the private owners would be interested in retiring the animals to such housing (either Chimp Haven, or developing or supporting an alternative facility if maximum capacity at Chimp Haven is reached, or the private sector believes they have a more efficient alternative).

Discussion and Conclusions

While ethical considerations are at the forefront of the discussion of the Great Ape Protection and Cost Savings Act, the impact in terms of cost savings would be substantial in itself.

This savings come with limited costs. In terms of expenditures, the cost of alternative housing and substituted research are already built into the net savings calculation. Obviously findings from the prohibited research would no longer be generated. But the ongoing invasive research appears to be almost all vague exploration that is already being conducted using other methods, rather than attempts to answer specific questions of immediate value. It has been suggested that some deadly emergent disease might change the ethical calculus and call for experimentation on chimpanzees. But should such an unfortunate event occur, the retired

chimps could be drafted back into research (there are no specific provisions for that, but obviously it would be done in an emergency). Thus, this contingency does not represent any real opportunity cost of ending existing research or changing the housing situation. It could be argued that there is not currently enough capacity in sanctuaries to house the lab chimps, and expansion might not keep up with demand created by the proposed phase out – the provision for retirement in the legislation takes effect no later than three years after enactment. But this is no reason to not retire the chimpanzees as rapidly as possible; indeed, because of the current extra capacity at Chimp Haven, the savings will be greatest for the first rounds of retirements.

To the extent there is concern about job creation, Chimp Haven appears to employ slightly more people for housing and care of the animals than do the research labs (though the latter figure is difficult to estimate), despite the lower cost. Funding that is shifted away from research projects using chimpanzees could be shifted towards other areas of health research, used for other federal government projects, returned to the private sector, or used to reduce the deficit. Because chimpanzee research is so expensive, it seems almost certain that repurposing these funds elsewhere in the economy will result in an increase in jobs, but analyzing that is beyond the present scope.

Summing the potential savings from the proposed legislation, and interpreting the data conservatively, shows cost savings of almost $20 million annually. This is based on over $15 million in research grants (conservatively predicting that non-chimpanzee aspects of the research would go forward and there would be some substitute research, and allowing that some of the research grant funding was really subsidizing housing), over $1 million in housing savings from the immediate economies of scale for doubling the Chimp Haven population, and $2 million in subsidies for housing privately owned animals.

Relaxing the conservative assumptions puts savings from research grants alone closer to $20 million. Adding to that the net long-run savings in housing costs from expanding Chimp Haven, allowing for greater savings from discontinuing private subsidies, and allowing for some savings related to lab capital expenditures and breeding could increase the annual savings estimate from the conservative $20 million to $25 million or more.

TABLE 1: Summary of Federal Budget Savings

Category of savings		Annual savings ($ million)
Grants for invasive research[1]		15-20
Sanctuary Housing rather than Lab Housing[2]	first 100 transferred	1.3[3]
	additional transfers	positive but not quantified[4]
Ending current breeding of chimpanzees		1
Ending housing and care subsidies for privately owned chimpanzees[5]		2
Avoiding future costs of breeding and lab capital improvements		positive but not quantified[6]

[1] Based on review of FY2011 NIH grants. Conservative end of range based on assumption that projects including components that did not depend on invasive research would not be reduced substantially, and that a substantial portion of the grants covers housing and care costs. See text for details.

[2] See Table 2 for details.

[3] This figure is reported at greater precision than the others because (a) it is based detailed accounting estimates by Chimp Haven and (b) it is useful to emphasize that a careful calculation of this figure shows it to be positive. (Every other entry in this table is self-evidently positive, even if imprecise, while this one theoretically could be negative, so it is worth emphasizing that it has been carefully calculated.) The level of precision reported is not meant to imply that the total savings can be estimated with such precision.

[4] Exact value depends on method for discounting of out-year savings compared to capital costs as well as exact life expectancy of the chimpanzee population.

[5] Based on conservative assumption of only 50% subsidy for 125 chimpanzees at Southwest National Primate Research Center and Yerkes National Primate Research Center

[6] There is little basis for exactly quantifying what would happen if the current bill was not adopted. The possibilities range from minimal upgrades of facilities to resuming an aggressive breeding program, and so the avoided costs could be anywhere within the seven-figure range.

TABLE 2: Comparative Cost of Housing and Summary of savings[7]				
Population	Source	Federal cost per chimp×day	Number of chimps (based on most recent reports)[8]	Estimated annual federal cost per 100 chimps
Federally-owned laboratory chimps	Conservative estimated average	$60[9]	478	$2.2 million
Federally-subsidized laboratory chimps	Assumption of approximately 50% subsidy	$30	210	$1.1 million
Chimp Haven, 2010	Chimp Haven annual report	$44[10]	116	$1.6 million
Chimp Haven, next 100 chimps	Chimp Haven growth projections	$32		$1.2 million

Summary of annual federal budget cost savings related to chimpanzee housing	
Chimp Haven 2010 (population=117) vs. all-lab housing	$0.7 million
Next 100 chimps transferred to Chimp Haven	$1.3 million
Most or all of remaining lab population transferred	additional savings[11]

[7] NIH's official 2011 estimates on the cost to care for chimpanzees in laboratories and sanctuaries (grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm) allow for no useful estimate of the actual cost. The maximum is a bit of an overestimate (see note 2) but the lower numbers clearly fail to account for other sources of funding

[8] These numbers change constantly due to deaths and other factors, but are approximately current.

[9] Conservative estimate based on cost to care for chimpanzees based on what NIH is currently paying for federally-owned chimpanzees.

[10] This is supplemented by private donations; the federal contract pays for 75% of variable costs and 90% of construction costs. This figure is somewhat conservative because it does not use the maximum population, but rather estimates the average, and because it may include some one-off capital costs. NIH incorrectly reported the 2011 cost to have been $47 based on an unrepresentative period, though Chimp Haven reports it has actually dropped a bit compared to 2010.

11 It is clear there will be a savings, but it is complicated by trading off needed capital expansion versus lower variable cost, as well as unknown savings in lab capital costs that would result.

Senator CARDIN. Thank you, Dr. Wasserman.
Dr. Schildwachter.

STATEMENT OF GREG SCHILDWACHTER, PH.D., WATERSHED RESULTS LLC

Mr. SCHILDWACHTER. Thank you, Mr. Chairman, and thank you for your excellent pronunciation. I appreciate that as much as I appreciate Senator Inhofe's welcome though it was remarkable more for enthusiasm than for accuracy in pronunciation.

[Laughter.]

Mr. SCHILDWACHTER. And I thank you for taking up the measures before you today. They are nearly all about active conservation, which gets less publicity usually than environmental conflicts, perhaps because it is less noticeable in the out of the way places where it takes place and less attractive with the actual physical labor involved in habitat restoration. But it is more important than what divides us.

We cannot live without wildlife or the places where they live. And active conservation is how we ensure that we have them. It is a starting point for where we can all agree. It is a standard for resolving our disagreements over regulatory protections. And it has been the historical commitment for sportsmen for more than a century in American history. And though I speak today for myself, I know for sure that many sportsmen's organizations will share in the views that I share with you today, especially in thanking you for the bipartisan agreement on the agenda today.

Active conservation comes down to someone who must do the work, and often that is the landowner. In fact, it must be a landowner if we are to succeed. We also need Federal support to share this responsibility. The costs must be shared because the values are also shared, and the benefits that are created from habitat conservation.

The programs you consider today show that responsibilities are being shared in a way resembling infrastructure policy. That is appropriate because habitat is the infrastructure for wildlife, and the principle at work is that those who enjoy the benefits most directly pay most directly to support them. The general benefits fall on everyone, and therefore a share of Federal funds is right and proper. The sportsmen's ethic has always been to create and cultivate that which we seek to enjoy and to pay our way.

The National Fish and Wildlife Foundation is an example, and I support Senate 1494 to reauthorize it. NFWF is a true—not rhetorical—investment in that $1 of Federal expense returns multiple dollars back from the private sector. It returns an actual return. NFWF has proven successful in its nearly 30+ year history, nearly 30-year history, and the bill refines the authority according to that experience. For example, the provision authorizing how funds can be exchanged between NFWF and the agencies will make it more efficient.

NFWF is a valuable mixed model of public and private conservation to leverage the strengths of the governmental role and the abilities of the private sector. Likewise, NAWCA, the North American Wetlands Conservation Act, is a cost share arrangement between private and State partners that raise money for wetland con-

servation, and I support S. 2282 and recommend its reauthorization. NAWCA is one of the six major wetland programs we have and part of the reason we are on track to regaining prevalent wetlands in this country.

The Duck Stamp Program for which we have both Senate 2071 and Senate 2156 is similar, and I support these bills as well. With these measures, more people will be able to purchase the duck stamp more easily, and the inflation adjustment likely to follow will restore some of the buying power of these conservation dollars.

I support Senate 1249 for similar reasons. Shooting ranges are a different form of infrastructure for conservation, but these are places where training and competition in the skills of marksmanship become either a hobby or the avocation of fair chase hunting. Arms and ammunition pay an excise tax into the fund that would support these ranges and which, in turn, would create more revenue for the fund and recruit more participants in the sports that support wildlife and habitat conservation.

I have fewer observations on the other measures, Mr. Chairman, but I have provided these in my written statement.

I thank you again for the opportunity to appear. I look forward to any questions.

[The prepared statement of Mr. Schildwachter follows:]

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TESTIMONY BEFORE THE SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON WATER AND WILDLIFE

LEGISLATIVE HEARING on

S. 810, Great Apes Protection and Cost Savings Act of 2011 • S. 1249, Target Practice and Marksmanship Training Support Act • S. 2071, Permanent Electronic Duck Stamp Act of 2012 • S. 357, Wildlife Disease Emergency Act of 2011 • S. 1494, National Fish and Wildlife Foundation Reauthorization Act of 2011 • S. 1266, Delaware River Basin Conservation Act of 2011 • S. 2156, Migratory Bird Habitat Investment and Enhancement Act

Greg Schildwachter, PhD

Watershed Results LLC

March 13, 2012

Thank you for taking up these important measures. My comments begin with the bills closest to my expertise as a professional conservationist, which includes my background as a biologist and staff director for this subcommittee, and my current practice as a consultant and advocate for sportsmen, other conservationists, and businesses and philanthropies with conservation interests. I am sure many of them hold views like those I express below but I am speaking only for myself today.

The bills concerning the National Fish and Wildlife Foundation (S. 1494), the Duck Stamp (S. 2071 and S. 2156), and the Pittman-Robertson Act (S. 1249) all relate the core ethic of hunters, fishermen, and other stewards of nature. Our ethic is to create and cultivate that which we seek to enjoy: fish and wildlife and their habitats. These are essential pleasures to us in season and out as well as to the millions of others who know them as the scenery of great places for outdoor fun. These bills call upon the proven commitment of sportsmen to sustaining these treasures, which is good cause for support and a good general principle for understanding fish and wildlife issues.

The ethic beneath these bills is rooted deeper than a century in American history and is sturdy support for confidence going forward. When Theodore Roosevelt founded the first national wildlife conservation group in America – the Boone and Crockett Club (1887) – local hunting and fishing clubs had already been active for 50 years advocating for basic wildlife laws we obey to this day. Since TR later set conservation as a national issue during his presidency, sportsmen have put their passion for wildlife toward resolving the larger paradoxes of wildlife policy, such as how to secure the public trust for wildlife while supporting it with the efficiency of private enterprise. We have done it well, as NFWF, the Duck Stamp, and Pittman-Robertson have shown, and today we consider refinements that will improve these policies further.

Several of these policies are user-pay arrangements that keep costs and benefits closely tied to those who participate, but there are important general benefits also. These policies and programs use public spending for real economic rewards that self-perpetuate by turning increased participation into added opportunities to participate. I ask your help carrying this success forward.

S. 1494, National Fish and Wildlife Foundation Reauthorization Act of 2011

I recommend passage. NFWF has proven successful in its nearly-30-year history and the bill refines its authority according to what we have learned through experience.

For example, the provisions authorizing how NFWF and public agencies may exchange funds are designed to make those transactions more efficient. NFWF already covers all overhead costs for the work done with direct appropriations. We should ensure that routine transactions do not needlessly add to those costs.

The authorization of appropriations is the central piece. As you consider it, please note that NFWF is a true – not rhetorical – investment. It returns actual dollars for a public dollar committed. This is especially relevant to your proper scrutiny of the Federal budget now underway. Nothing can be spared from this scrutiny or some meaningful reduction that helps control unsustainable deficits. For the same reason, efficient spending that helps move the economy should be recognized as such and allowed to continue working. NFWF has consistently doubled or tripled its appropriation with private dollars. It is also part of the strong multiplier effect by which conservation promotes economic activity. For example, the outdoor recreation economy that depends on fish and wildlife and habitat, generates $730 billion in total economic activity. Of this, $289 billion annually is direct retail sales. These activities also raise $88 billion in annual state and federal tax revenue.

NFWF is a valuable mixed-model between public and private conservation that is able to leverage the strengths of the governmental role in conservation with the strengths of the private sector's abilities. For example, in government, salmon conservation is a joint responsibility of several departments and bureaus, and NFWF is able to focus concerted efforts on goals through a unified program. Also, for government, response to the Gulf oil spill must necessarily be deliberate and painstaking, and NFWF is able to move fast and logically to begin the most obvious response work immediately, as it did last year.

NFWF is good business for conservation and this bill deserves your vote.

S. 2071, Permanent Electronic Duck Stamp Act of 2012; S. 2156, Migratory Bird Habitat Investment and Enhancement Act

I recommend passage of both of these bills. The Duck Stamp is the historic symbol and means of securing waterfowl habitat. But it has also been a bit frozen in time as it still only dabbles on the Internet and has not been adjusted for inflation since we all still used floppy disks.

It has proven largely successful and will be more so with the changes proposed here. This program operates with very low overhead costs and the Office of Management and Budget review in 2008 found the program largely effective and efficient. With the improvements of these two bills, more people will be able to purchase the Duck Stamp more easily and the inflation adjustment likely to follow from S. 2156 will restore some of the buying power of these conservation dollars.

Two more reasons to support upgrading the Duck Stamp program: it is one of the user-pay arrangements in sportsmen conservation and it is far more effective in achieving wetland conservation goals than regulatory schemes. It is "user-pay" on its face because you must buy one to go duck hunting, and at a deeper level because what you pay enables habitat conservation that makes it possible to go duck hunting. On the regulatory point, I refer to the detour of the last few years in which a debate over wetland regulation, which mitigates about 20,000 acres per year, has turned attention away from active conservation programs that conserve nearly 1 million acres per year supported in part by the Duck Stamp program. A vote for these bills is a move back toward what we can accomplish by action that we can never do through regulation alone.

S. 1249, Target Practice and Marksmanship Training Support Act

I recommend passage. Shooting ranges are, like wetlands, a form of infrastructure for conservation and this bill would enable the use of existing sportsmen-conservationist dollars to pay for them, which, in turn, will create more revenue for this fund and recruit more participants to the sports that support wildlife and habitat conservation.

The bill is timely to address two pressing problems: (a) declining opportunity to participate in shooting sports and (b) obstacles to recreational shooting on public lands. Sportsmen have in the last 12 years accomplished several reviews of the status of hunting and other shooting sports that identify the issues on which the future of conservation hangs. One recurring leading issue from these studies is, simply put: we need more people to go outside and play. The need is acute for involving young people and also former participants in shooting sports, hunting, and other outdoor recreation. Shooting sports, and therefore shooting practice ranges, are a key to success.

The availability of recreational shooting opportunity is a precursor to recruiting participants to this and other forms of outdoor recreation, including hunting. Starting in 2000 when several sportsmen conservation groups formed the American Wildlife Conservation Partnership, and continuing through the work of the Sporting Conservation Council (a Federal Advisory Committee) and the publication of the 10-year Action Plan pursuant to Executive Order 13443 and its adoption by the Wildlife and Hunting Heritage Conservation Council, sportsmen have been repeatedly clear that we need more such opportunities.

The bill properly calls upon the Pittman-Robertson fund for support of shooting ranges. This fund collects the revenue of the Federal excise tax on sporting arms and ammunition; therefore, it is another example of the user-pay principle in conservation policy and is self-perpetuating: as we encourage more participation in recreational shooting and in hunting, we expand the customer base that pays the excise tax.

There is an issue that this bill fails to address that should be noted without delaying the progress of this bill. Shooting ranges on the lands of the Bureau of Land Management are governed by the Recreation and Public Purposes Act, which complicates arrangements noticeably in comparison to the Forest Service, which has more discretion. In fact, partly because of these complications, the BLM is, in effect, phasing out shooting ranges in parts of the country where sites are most available. I hope this issue attracts some interest from members of the committee and I offer to help find a way to address it.

S. 1266, Delaware River Basin Conservation Act of 2011

I understand this bill has already been reported. I think large-scale conservation efforts such as this one make a lot of sense, especially in watersheds that serve so many people, because this approach is more likely to spur active projects to improve resources than to rely on regulatory approaches alone.

The greatest challenges to a large-scale conservation effort are reaching agreement on a list of priority actions, sticking to that list as closely as resources and opportunities allow, and reserving some of the scarce time and money in the effort for measuring results.

I recommend focused efforts on these challenges by all involved regardless of whether this bill becomes law.

S. 357, Wildlife Disease Emergency Act of 2011

I would like to work with the sponsors of this bill to find a way to support more and better attention to wildlife diseases including white-nose syndrome. My first professional work in wildlife science concerned wildlife diseases. I applaud the motivation for this bill. Knowing how

important wildlife health is to me, I know it must be to the sponsors of this bill, but I cannot support the current bill.

I agree with ramping up attention to wildlife disease, and many state agencies, universities, conservation groups share this general view. Some challenges are new and some longstanding zoonotic disease issues such as brucellosis and bovine tuberculosis are suffering from their own success as great progress in their control has diminished interest in completing the work for the relatively small populations of people and wildlife still affected.

Several excellent institutions should be involved in any effort to bring new and renewed attention to wildlife disease. The University of Georgia has specialized in wildlife disease for more than 50 years and responds to, monitors, and studies wildlife diseases throughout its region and elsewhere in the country and the world. Other institutions in the Midwest and West do similar work. The Association of Fish and Wildlife Agencies has long overseen disease issues through its standing committee on the topic, has helped develop state capacities to manage disease, and has already established the cooperative relationships called for in the bill. The Boone and Crockett Club, the Rocky Mountain Elk Foundation, Wild Sheep Foundation, and Trout Unlimited have all responded to diseases affecting their iconic species and other wildlife.

With so many efforts already underway, I am not sure that the approach described in this bill is best, but I am certain there is a way that Federal law and programs can assist current efforts and I applaud Sen. Lautenberg and his cosponsors for their attention to this. I hope I can be helpful working with staff going forward.

S. 810, Great Apes Protection and Cost Savings Act of 2011

I have no position or advice on this bill. Respect for animals is a necessary demonstration of how important they are to us. Research is an invaluable aid to humanity and wildlife. I am aware of and support animal use and care requirements in my own field and believe the veterinary sciences have adopted detailed requirements in theirs. The specifics are beyond my expertise, so I am reserving judgment on the bill.

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Supplemental Testimony on

S. 2282, North American Wetlands Conservation Extension Act of 2012

TESTIMONY BEFORE THE SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON WATER AND WILDLIFE

LEGISLATIVE HEARING on

S. 810, Great Apes Protection and Cost Savings Act of 2011 • S. 1249, Target Practice and Marksmanship Training Support Act • S. 2071, Permanent Electronic Duck Stamp Act of 2012 • S. 357, Wildlife Disease Emergency Act of 2011 • S. 1494, National Fish and Wildlife Foundation Reauthorization Act of 2011 • S. 1266, Delaware River Basin Conservation Act of 2011 • S. 2156, Migratory Bird Habitat Investment and Enhancement Act • S. 2282, North American Wetlands Conservation Extension Act of 2012

Greg Schildwachter, PhD

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April 24, 2012

S. 2282, North American Wetlands Conservation Extension Act of 2012

I recommend passage. The NAWCA program conserves wetlands mainly beyond the National Wildlife Refuge System and therefore complements the Duck Stamp program. It is one of the 6 major wetland conservation programs we have and, like the Duck Stamp program and the National Fish and Wildlife Foundation, it raises private dollars from those who most directly benefit from its results – and yet those results also benefit many others directly and all of us ultimately.

The clean extension provided by S. 2282 is exactly the right thing to do both programmatically and fiscally.

Programmatic controls on the effectiveness of this program are continuing to evolve through 2nd-party reviews that identified shortcomings in documenting the many results of the program. In response to this, the Fish and Wildlife Service has developed a tracking and accountability system that continues to improve. I am very confident in its accomplishments and quite comfortable with programs that first produce results on the ground and later develop an apparatus of paperwork to steer and refine efforts.

Fiscally, programs such as this one that are supported by private dollars from those who benefit most directly, and that provide a form of infrastructure that also benefits others, and that furthermore support jobs, services, and sales, should be prized as we find ways to balance the Federal budget. Many sportsmen and other conservationists support needed fiscal reform. We take the strategic approach – and the attendant risks – of supporting reforms in entitlement programs as well as cuts in our own programs. The nation must address the programs with the greatest effect on Federal spending, and the nation is wise to acknowledge spending that helps support and turn the economy. NAWCA is one of the latter. Like many other conservation grants, NAWCA grants produce wildlife habitat where hunters, fishermen, hikers, paddlers, birdwatchers, and many others spend money to visit while staying in hotels, hiring guides, buying equipment, and otherwise creating economic activity. It is also leveraging more than dollars: it also prompts additional habitat work on the ground that partners add on to projects at their own expense after the initial publicly-supported project is complete.

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REPLIES TO QUESTIONS FOR THE RECORD – SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON WATER AND WILDLIFE

LEGISLATIVE HEARING on

S. 810, Great Apes Protection and Cost Savings Act of 2011 • S. 1249, Target Practice and Marksmanship Training Support Act • S. 2071, Permanent Electronic Duck Stamp Act of 2012 • S. 357, Wildlife Disease Emergency Act of 2011 • S. 1494, National Fish and Wildlife Foundation Reauthorization Act of 2011 • S. 1266, Delaware River Basin Conservation Act of 2011 • S. 2156, Migratory Bird Habitat Investment and Enhancement Act • S. 2282, North American Wetlands Conservation Extension Act of 2012

Greg Schildwachter, PhD

Watershed Results LLC

June 19, 2012

Senator Benjamin Cardin

Target Practice and Marksmanship Training Support Act

1. Do you agree that conservation leads to benefits for hunters?

We may have different understandings of the terms "conservation" and "hunting", so apologies if I miss your meaning. To me and other sportsmen, this question would sound odd, like asking if medicine leads to benefits for doctors. Hunters are practitioners of conservation and engage in it to create benefits both for their own pursuits and to produce the general benefits stewardship. This is why hunters played a leading role in creating American conservation agencies and other institutions and why hunters practice so much conservation today.

It was hunters who formed the Boone and Crockett Club in 1887, which, as Dr. George Reiger describes in American Sportsmen and the Origins of Conservation (2001, Oregon State University Press), "was named after two of America's most famous hunters [and] was the first private organization to deal effectively with conservation issues of national scope [such as] the creation and administration of the first national parks, forest reserves, and wildlife refuges" (p. 4).

As an example of how hunters practice conservation, note that this year is the 75th anniversary of the founding of the group Ducks Unlimited, which is one of the many mission-oriented

hunting groups founded since the Boone and Crockett Club to enhance particular species or types of wildlife or habitat. DU's precursor organizations were the *American Wild Fowlers* and the *More Game Birds in America Foundation*. These groups, like others that have focused on other game birds and big game wildlife, have accomplished nationwide restoration of these species and their habitats. Ducks Unlimited has conserved more than 12.6 million acres of habitat in North America and has, in the words of Dan Ashe, the Director of the U.S. Fish and Wildlife Service, "led the way when it comes to conserving habitat for the benefit of waterfowl, other wildlife, and people" (remarks at the signing ceremony for the 2012 Revision of the North American Waterfowl Management Plan, June 1, 2012).

2. In the past, you've highlighted the close links between hunting and conservation. Yet the benefits of wildlife protection can extend the local economy. Is there sufficient interest in these shooting ranges to generate that type of local economic benefit?

Again, please forgive me if our terms differ, because this question appears to put conservation and protection in contrast to one another, though in fact protection is part of conservation. Conservation is an encompassing category of stewardship of natural resources that involves protection and also some forms of development and certainly also includes scientifically-guided harvest and other removals of wildlife, trees, and grasses through hunting, forestry, grazing, and prescribed burning. The close link between hunting and conservation supports local economies, as do protected areas that serve conservation purposes, especially if these areas are not managed actively but are open to hunters and anglers, hikers, rafters, bikers, birdwatchers, and other recreationists. In similar ways, shooting ranges play a role in conservation and support local economies also. For a thorough view of these economic benefits, refer to the report, The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States, produced for the National Fish and Wildlife Foundation by Southwick Associates (October, 2011). I have attached an electronic copy for inclusion in the hearing record.

The primary support that shooting ranges provide for local economies is through purchases of guns and ammunition and other shooting equipment, much of which are local transactions and some of which include out-of-town visitors who also buy fuel and rent hotel rooms.

Shooting also supports the national economy and the heart of the U.S. conservation system. That system relies on an excise tax on sporting arms and ammunition, which since 1991 has amounted to more than $3 billion. This revenue is allocated to state wildlife management agencies to manage wildlife and habitat. At the same time, while shooting is a sport unto itself, it is also an entry-point into hunting and other forms of conservation that recruits new volunteers for conservation organizations.

Senator James Inhofe

1. Can you talk about the importance of reauthorizing the North American Wetlands Conservation Act, and more specifically, why it is important to have a voluntary program like NAWCA that incentivizes state and private funding?

We need to reauthorize NAWCA in particular and continue with other voluntary incentive programs in general because these types of programs inspire active conservation among landowners and other non-federal partners and attract financial donations to match and state and federal spending.

The economic value of matching programs like these is obvious, and there are also less noticeable values in the type of conservation that NAWCA accomplishes and the broader significance of voluntary conservation.
NAWCA and other voluntary programs promote active conservation on private lands. This type of conservation relies on resources in the private sector including private land, labor, and expertise. It applies these resources to accomplish actions such as prescribed burning and wetland restoration that improve habitat conditions that will not develop – and likely would degrade – without such intervention.

Finally, in a larger sense, these programs that call upon individuals to take responsibility for conservation are a continuing reminder that conservation cannot persist by sole reliance on governmental action. This was a key insight of Aldo Leopold, our founding wildlife scientist and philosopher of conservation who wrote the first textbook in wildlife conservation (Game Management, 1933) and many famous and beloved essays (A Sand County Almanac with Sketches Here and There, 1949).

Leopold described the role for governmental conservation as large and growing during his career more than 70 years ago. He spent most of that career working in governmental conservation. He predicted it would grow further and it did. At the same time he also warned of "a clear tendency in American conservation to relegate to government all necessary jobs that private landowners fail to perform." He warned that many of these jobs are "too large, too complex, or too widely dispersed to be performed by government." His view has been borne out both scientifically and culturally. It is through programs like NAWCA that we properly limit what we ask of state and federal governmental programs and properly encourage involvement by landowners and others.

2. How do voluntary efforts to promote conservation raise more money for the federal government and work more efficiently than regulation and mandates? How does the user fee model better leverage private and public funds to promote conservation than government regulation and mandates?

Voluntary conservation extends buying power of public funding and the user-fee model raises additional dollars by appealing directly to and collecting revenue from those who benefit most directly from conservation.

Wealthy countries such as the United States are blessed with strong private contributions that match public funds for conservation and support non-profit groups. User-pay arrangements add additional funds to the conservation economy by collecting receipts directly in exchange for enjoying the outcomes of conservation. For example, entrance fees, licenses, and excise taxes on equipment and supplies are all means of collecting user-pay receipts. Note: the reason we count a federal excise tax among "voluntary" user-pay arrangements is that hunters and firearms manufacturers devised and supported passage of this policy in the 1930s and have supported it since.

The regulatory-and-mandates approach to conservation differs from voluntary-user-pay approaches in what it is designed to accomplish. Regulations and mandates are best suited for establishing standards for controlling risks. Voluntary-user-pay arrangements are better suited for producing outcomes by applying resources, labor, and expertise. Prohibitive standards can require expenditures (e.g., investing in pollution-control technology) but voluntary-user-pay arrangements run on directed, purposeful investments organized to produce results. Furthermore, a standard that successfully controls risk (which includes balancing the costs and benefits at a level with broad public support) has succeeded in maintaining a conservation value; on the other hand, a voluntary-user-pay program that succeeds does so by creating, restoring, or maintaining a conservation value.

3. You mentioned the economic benefits of voluntary conservation efforts such as NAWCA. Can you expand on how programs like this create infrastructure and help further economic recovery?

Habitat is the infrastructure of wildlife conservation as roads, waterways, pipes, and sewers are the infrastructure of society: each enables the population it supports to move about and find and use the resources it needs to survive. As for society, where the costs of living and transporting and transacting goods and services is related to the quality of infrastructure, so for wildlife populations the challenges of finding and moving among sources of food, water, shelter, and space influence the size and strength of those populations.

By the same analogy, NAWCA and other habitat programs boost economic activity. Well-maintained and efficient roads and utilities make economic activity easier for people by aiding transactions. Likewise, wildlife habitats make it possible and affordable for hunters, anglers, birdwatchers, and other recreationalists to seek out and enjoy fish and wildlife, which requires them to purchase equipment and services and pay travel costs.

Senator Jeff Sessions

1. Dr. Schildwachter, could you explain how some of the federal voluntary conservation programs on today's hearing agenda are based on a "user-pay arrangement"?

"User-pay" refers to the arrangement by which the cost of a public service is paid or defrayed by the citizens who benefit most directly from that service. A toll road, for example, is a public route paid for in part by those who drive there. Most wildlife conservation is funded in a similar way in that hunters and anglers pay state and federal license fees to hunt and fish and pay a federal excise tax on sporting arms, ammunition, tackle, and boat fuel. These fees and taxes fund state and federal programs to maintain and restore fish and wildlife populations.

The analogy holds in a broader sense as well. Just as roadways benefit society at large by supporting the production and delivery of goods and services, so does wildlife conservation benefit society by maintaining, creating, and restoring habitats that beautify landscapes and help purify air and water.

The relevance of "user-pay" for policy is in helping decide budget allocations. User-pay clearly indicates shared responsibility for public benefits like wildlife conservation. The benefits are shared among individuals who seek them, others who appreciate them, and everyone who is better off indirectly. Correspondingly, the costs are borne directly by some and indirectly by others. Public budgets should favor these user-pay arrangements because they are less of a transfer of wealth than other programs and make more with public funds.

2. Has it been your experience that voluntary, proactive conservation programs like NAWCA and NFWF are preferable to heavy-handed, coercive, bureaucratic approaches like those embodied in the Administration's "wetlands guidance document"?

The issue here is not the preferability between regulations and voluntary action but the proportionate use of each. Also, by promoting incentives and action, we can help resolve the regulatory standoff.

The guidance and the debate over the guidance are both needlessly overblown, but it is easy to see how we arrived in this situation. The difficulty in setting wetlands regulations has become plain in the several court cases that have reached the Supreme Court in the last decade and in the advocacy campaigns drummed up around the attempt by this administration and the last to implement those court rulings.

We have lost perspective of the basic policy challenge in the competition over the complications in setting the reach of federal authority and the improving the effectiveness of federal regulations.

The basic challenge is to reverse the trend of wetland loss by eliminating careless losses, avoiding needless losses, and producing gains by restoring and creating wetlands. The regulations address the careless and the needless losses; NAWCA and other programs address restoration, creation, and enhancement. The regulatory program has permitted the conversion of around 20,000 acres per year in recent years, which is the net result of examining development proposals, forbidding careless conversions, and minimizing necessary conversions. And, these 20,000 acres are not utterly lost because they have been replaced with more than the same acreage of wetlands created or restored elsewhere as mitigation. Meanwhile, NAWCA and other programs create, restore, and enhance nearly 1 million acres per year over and above the 20,000+ acres of mitigation that we have tabulated separately. The tabulations are explained in the four annual wetland reports issued by the Council on Environmental Quality in 2005-2008.

We can and should depressurize the regulatory debate by promoting the active programs like NAWCA and NFWF. First, active programs produce far more acres of benefit than are secured by the regulatory program. Second, active programs produce intentional benefits at larger scales than do regulatory programs which guard against incidental losses on the margins of scattered activities such as road building and real estate development that are undertaken for other reasons. With greater confidence that we are reversing the trend of wetland loss by concerted and directed efforts, we should find it easier to resolve the technical and political difficulties holding up a workable and durable policy on wetland regulations.

3. Is it your review that youth today have fewer and fewer opportunities to participate in shooting sports than previous generations? How would S. 1249 help to address that issue?

There are fewer opportunities for shooting sports today because more people live in urban and suburban areas. While these higher-density population areas are efficient uses of space that help enable us to set aside recreation lands, it also makes it more difficult to reach those recreation lands. To create more opportunities for shooting sports, therefore, it helps to have

enough ranges that they are accessible and designed to be placed safety in proximity to other land uses. S. 1249 helps in this by expanding the allowable uses of existing private-state-federal partnership funds to include shooting ranges.

4. I think you are right that wildlife diseases such as the White-Nose Bat Syndrome need to be addressed. Regarding S. 357 (Wildlife Disease Emergency Act), what are your specific concerns?

Simply that many state, state-based, and private institutions are already working on wildlife diseases and collaborating with federal agencies on these problems yet these existing arrangements do not seem to be acknowledged or built upon in S. 357. I am sure that, based on existing cooperation, an effective rapid-response policy can be developed by the community of wildlife disease experts that will enhance their efforts.

The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States

For:
The National Fish and Wildlife Foundation

By:
Southwick Associates
October 10, 2011

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Summary Findings

Outdoor recreation, natural resources conservation and historic preservation in the United States all have measurable economic impacts. Some selected facts from the following report are highlighted here. These are illustrative of the entire picture that can be developed following a close study of the economics of these sectors at the national level. All dollar figures are reported in 2011 dollars, except as noted.

Combined Value of Outdoor Recreation, Nature Conservation and Historic Preservation

Values for jobs, tax revenues and other economic impacts are reported in this review for numerous forms of outdoor recreation, conservation and historic preservation activities. Due to limited data, it was not possible to account for all economic contributions from these activities. An accounting is presented here of the known activities presented in this report, which can be considered a minimum estimate:

Jobs = 9.4 million
Federal, state and local tax revenues = $107 billion
Total economic activity (equivalent to GDP) = $1.06 trillion.

Outdoor Recreation

- In 2006, the total contribution from outdoor recreation in the United States was over $730 billion a year, generates 6,435,000 U.S. jobs and $88 billion in federal and state tax revenues. This includes hunting, fishing, wildlife viewing and the "human-powered" recreations such as hiking, camping, skiing, paddle sports and bicycling.

- In 2008, 28.3% of U.S. adults went boating at least once. Recreational marine manufacturers employed more than 135,900 people and retail boating/service businesses employed another 217,718 people.

- Other motorized recreation, such as motorcycles, off-road vehicles, and snowmobiles are not included in the estimates presented above but would push the totals to larger levels.

- The combined spending effect of hunting, fishing and wildlife watching associated with National Forest Service land totaled $9.5 billion in annual retail sales, supported 189,400 jobs and provided $1.01 billion in annual federal tax revenues.

- Visitors to Army Corp of Engineers land generated $34.0 billion in sales, contributing $17.1 billion in direct income, and supported 420,000 jobs at the national level in 1996.

- Outdoor recreation sales (gear and trips combined) of $325 billion per year are greater than annual returns from pharmaceutical and medicine manufacturing ($162 billion), legal services ($253 billion), and power generation and supply ($283 billion).

Natural Resources Conservation

- The total value of ecosystem services provided by the acreage of natural habitats in National Wildlife Refuges in the United States totaled $32.3 billion/year, or $2,900 thousand/acre/year.

- The value of ecosystem services provided by natural habitat in the 48 contiguous United States amount to about $1.6 trillion annually, which is equivalent to more than 10% of the U.S. GDP.

- The loss of about 9.9 million acres of wetlands in the U.S. since the 1950s has resulted in an economic loss of more than $81 billion in all wetlands-related ecosystem services.

- Visitors to Army Corp of Engineers land generated $34.0 billion in sales, contributing $17.1 billion in direct income, and supported 420,000 jobs at the national level in 1996.

- Home owners near parks and protected areas are repeatedly seen to have property values more than 20% higher than similar properties elsewhere.

Historic Preservation

- Nationally, the federal tax credits returned more than $22.3 billion in federal tax dollars since 1978 on $17.5 billion in tax credits – a return of 27.4% from every dollar invested.

- Economic activity resulting from federal historic preservation tax credits supports 61,200 jobs, $6.6 billion in economic activity and generated $935 million in tax revenues.

- On the statewide level, Philadelphia historic rehabilitation efforts resulted in average annual impacts of $1.1 billion in total expenditures that supported 9,560 jobs and $353 million in earnings within the state of Pennsylvania. Tax revenues

from this work included $6.6 million local taxes for the city and an additional $24.3 million in tax revenues for the state.

- In Texas in 1997, rehabilitation efforts created more than 4,200 jobs and overall historic preservation activities created more than 40,000 jobs in the state that year (Center for Urban Policy et al, 1999).

- In Nebraska an average of $46 million spent on statewide historic rehabilitation per year from 2001 to 2005 resulted in 1,004 jobs, and additional $31 million in income and 45 million in GDP at the national.

- Every million dollars invested in residential historic rehabilitation generates approximately 36 jobs, $1.24 million in income and nearly $200,000 in state and local taxes.

- Heritage tourism in Philadelphia supports over 45,000 jobs and $3.5 billion in economic activity annually.

- In 2010, 15 million visitors to Civil War Battlefield managed by the National Park Service in just five states (MO, PA, SC, TN, and VA) generated 7,700 jobs.

- Properties in historic districts have increased values, generally around 20% higher than other similar properties elsewhere.

Cross-Cutting Department of Interior Activities

- Overall, in 2010 activities associated with DOI lands provided more than 2.2 million jobs for Americans, which generated $377 billion in economic activity.

- Water, timber and forage activities on DOI land supported about 370,000 jobs and $50 billion in economic activity.

- About $2 billion was spent on construction and maintenance activities related to recreation and conservation, which supported about 41,000 jobs and contributed about $5.7 billion in economic activity.

- $222 million that was spent by DOI on land acquisition was estimated to contribute about $457 million in economic activity and support about 3,000 jobs.

- The U.S. Fish and Wildlife Service contributed about $4.2 billion in economic activity and supported over 32,000 jobs through their management of 553 National Wildlife Refuges and thousands of smaller natural areas in the United States.

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Introduction

This document was commissioned by the National Fish and Wildlife Foundation to serve two purposes. The first purpose is to identify the level of impacts that natural resource conservation, outdoor recreation and historic preservation have on the U.S. economy, what data currently exists and key data gaps that must be filled. Outdoor recreation and historic preservation are included to determine areas of potential economic overlap with the Foundation's natural resource conservation mission. The second purpose is to serve as the basis for the development of an assessment tool that can be used by the Foundation to determine the economic and job activity created by the Foundation's conservation grant investments.

The information in this report stems from a desk study of academic and trade journals, websites and other publications that cover these subjects. A number of studies were found that address methodology and economics theory regarding these topics, but they are beyond the scope and intent of this report and are not included here. Only those papers and websites which contain solid economic studies with relevant data are synopsized here and listed in the bibliography accompanying this paper. Unless otherwise noted, all dollar figures in this report have been converted to 2011 dollars to account for inflation.

Each section—outdoor recreation, nature conservation and historic preservation—has been covered separately, although there is some degree of overlap between these fields. For instance, the number of visitors to National Wildlife Refuges and their impact on local, regional and national economies is relevant to both the outdoor recreation fields (due to the large usage by hunters, anglers and wildlife watchers) and to natural resources conservation (due to the value of conserving these large tracts of natural land). Similarly, historic preservation literature contains information on the impacts of property values through historic designation and the nature conservation literature contains information on property values near conservation areas. The informational pie could be cut a number of ways, but the cleanest is to keep these sections separate in the discussion that follows.

One recent study by the U.S. Department of the Interior (DOI, 2011) cross-cuts all of these areas and is presented in its own section in this report to give an idea of the overlaps. Specific topics covered in the DOI report also are repeated under the relevant sections.

A. Outdoor Recreation

Thanks to national surveys that collect information on various types of recreation in the United States, there is a body of information available on the economic impact of various forms of outdoor recreation in the country, including hunting, fishing, wildlife viewing and non-motorized outdoor recreation (hiking, paddling, skiing, etc.). A few types of outdoor recreation, however, are not included in these surveys and country-wide impacts are not available, including motorized sports like off-road vehicles, snowmobiling, etc. However, a few statewide or localized studies give examples of some of the economic returns possible from these activities.

In addition, there have been a number of studies of the economic impacts from outdoor recreation in particular locations, parks and sites which emphasize the returns from these recreational activities in local communities and for the parks themselves. The results presented in this section overlap a bit with the nature conservation section when it comes to cataloguing the economic impacts from visitations to various refuges, parks and other recreational areas. Comments are provided when overlap occurs. All dollar figures have been converted to 2011 dollars to account for inflation.

1. Overall Outdoor Recreation (excluding motorized sports)

The standard reference for overall economic impact on the national level from outdoor recreational pursuits is the 2006 report "The Active Outdoor Recreation Economy" produced for the Outdoor Foundation, with data from consumer surveys conducted by Harris Interactive and analyzed by Southwick Associates, Inc. This report considers outdoor recreation to include bicycling, camping, fishing, hunting, paddling, snow sports, hiking, climbing and wildlife viewing, with data available both regionally and nationwide for these activities. Hunting, fishing and wildlife viewing impacts were obtained from other sources and added into the Outdoor Foundation study. Specifically, research conducted by Southwick Associates on behalf of the Association of Fish and Wildlife Agencies and the American Sportfishing Association for hunting and sport fishing, respectively, were built into the Outdoor Foundation estimates and the wildlife viewing impacts were obtained from the U.S. Fish and Wildlife Service. These three fish and wildlife-based recreation reports were developed using expenditure and participation data from the U.S. Fish and Wildlife Service's and U.S. Census Bureau's 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, and updated in 2006/07. The next national survey of fishing, hunting and wildlife recreation will be available by mid to late 2012.

Very limited information were available regarding participation and economic contributions from motorized sports like motorcycles, off-the-road vehicles, recreational vehicles and snowmobiling. This represents a significant gap in the literature and in the overall estimates of recreation's economic contributions.

In 2006, the Outdoor Foundation concluded that the total economic activity from outdoor recreation in the United States is $730 billion a year and generates 6,435,270 jobs in the country. Included in this total is $46 billion in gear retail sales, $243 billion in trip related sales and nearly $88 billion in federal and state taxes. These contributions come from both direct and ripple effects throughout the economy. Outdoor recreation sales (gear and trips combined) of $289 billion per year are greater than annual returns from pharmaceutical and medicine manufacturing ($162 billion), legal services ($253 billion) and power generation and supply ($283 billion), showing the sizeable impact recognized from outdoor recreation.

The national level impact from individual outdoor recreation is illustrated in Table A1. Of all the activities itemized, camping and biking provided the most jobs and had the largest economic impacts in the country.

Table A1: Economic Impact from Outdoor Recreation in the United States (2006, Outdoor Foundation)

	Number of Participants (millions)	Jobs Supported (thousands)	Gear Related Sales (billions)	Trip Related Sales (billions)	Fed and State Taxes (billions)	Total Economic contribution (billions)
Bicycling	59.8	1,135	$6.2	$46.9	$17.7	$132.8
Camping	45.1	2,334	$8.7	$100.6	$36.4	$273.0
Fishing	32.9	587	$6.4	$16.2	$4.1	$61.4
Hunting	12.8	323	$6.9	$5.5	$2.2	$34.1
Paddling	23.6	308	$2.7	$11.8	$4.8	$36.1
Snow-based	15.6	567	$3.1	$23.4	$8.8	$66.3
Trail-based	55.8	716	$3.3	$30.2	$11.2	$83.7
Wildlife Viewing	66.1	467	$8.8	$8.6	$2.7	$43.5
Total	--	6,435	$46.2	$243.2	$87.9	$731

2. Hunting, Fishing and Wildlife Watching

Hunting, fishing and wildlife-watching segments of the active outdoor recreation sector have been thoroughly studied and reported on for individual states and for the nation as a whole (US DOI, 2006). These data were incorporated into the Outdoor Foundation report discussed above. Additional details are presented in Table A2, based on the 2006

National Survey conducted by the U.S. Census Bureau on behalf of the U.S. Fish and Wildlife Service.

Table A2: Annual Participants and Expenditures for Hunting, Fishing and Wildlife Watching in the United States (US DOI, 2006)

Participants	87.5 million
Expenditures	$137.4 billion
Sportspersons	
Total participants*	33.9 million
Anglers	30.0 million
Hunters	12.5 million
Total days	737 million
Fishing	517 million
Hunting	220 million
Total expenditures	$86.1 billion
Fishing	47.4 billion
Hunting	25.7 billion
Unspecified	13.0 billion
Wildlife Watchers	
Total participants**	71.1 million
Around the home	67.8 million
Away from home	23.0 million
Total expenditures	$51.3 billion
* 8.5 million both fished and hunted.	
** 19.7 million both viewed wildlife around the home and away from home.	

In 2006, hunters and anglers spent $86.1 billion including trip-related expenses ($25.7 billion), equipment costs ($47.4 billion) and other expenditures ($13.0 billion) for items like magazines, permits, concession fees, etc. In addition, wildlife watchers in the United States spent $51.3 billion including trip-related expenses ($14.5 billion), equipment costs ($26.1 billion) and other costs ($10.8 billion) such as magazines, landscaping to attract wildlife and contributions to conservation organizations. These figures include expenditures for vehicles, boats, real estate and other large ticket items not included in the Outdoor Foundation's comprehensive outdoor recreation impacts.

A recent report (Southwick and Loftus, 2011) looking at the impact of excise taxes on hunting, shooting and fishing equipment found that in 2009 nearly $1.2 billion was collected from excise taxes on firearms, ammunition, archery equipment and ammunition, adding still more money to the economy via conservation efforts enacted by state conservation agencies – the recipients of these dedicated excise taxes.

Another study completed at about the same time assessed the economic impact of hunting, fishing and wildlife watching specific to National Forestry Service (NFS) lands (American Sportfishing Association, 2007). Data used in the American Sportfishing Association (2007) report stems from 2000-2003 visitor counts and spending information within 50 miles of NFS lands, as collected by the NFS via its National Visitor Use Monitoring survey (NVUM). Overall, hunters spent $1,100 million annually to hunt NFS lands, which supported 21,400 jobs across the country and provided $137 million in federal income taxes. Anglers spent $729 million annually, which supported 14,500 jobs and provided $81 million in federal income taxes. Wildlife viewers spent another $207 million in retail sales on or near NFS lands, which supported another 4,700 jobs and provided nearly $18 million more in federal taxes. The combined spending effect of these outdoor activities on NFS lands totaled $2.1 billion in annual retail sales, supported 40,600 jobs and provided $236 million in annual federal taxes. This data also shows some of the economic impacts of conserving natural habitats and is mentioned in the report section on nature conservation as well.

Additionally, the ripple effect greatly increases the economic contribution of fish and wildlife-based recreation on NFS lands. Table A3 below shows the total economic impact of hunting, fishing and wildlife watching on NFS managed land in the United States, based on 2000-2003 survey data and analysis of spending within the state where each forest unit is located (not limited to the 50 mile radii around each unit).

Table A3: The Annual Economic Effects of Hunting, Fishing and Wildlife-Viewing within U.S. Forest Service-Managed Units (American Sportfishing Association, 2007)

	Retail Sales (millions)	Total Ripple Effect (millions)	Salaries Wages & Business Profits (millions)	Jobs (Full & Part-time) (thousands)	Sales/ Fuel Tax Revenues (millions)	State Income Tax Revenues (millions)	Federal Income Tax Revenues (millions)
Hunting	$5,138.9	$14,052.7	$3,488.1	97.1	$198.7	$55.7	$621.2
Fishing	$2,755.2	$7,770.0	$2,016.6	57.7	$133.8	$35.2	$324.9
Wildlife Watching	$1,590.7	$3,966.5	$1,149.3	34.6	$85.8	$29.4	$134.6
Totals	$9,484.8	$25,789.2	$6,654.0	189.4	$418.4	$120.3	$1,080.6

3. Boating and Motorized Outdoor Recreation

Motorized outdoor sports include activities like off-road driving, snowmobiling, dirt biking and other sports engaged in on public and private lands, as well as boating on U.S. inland and coastal waters.

Recreational boating is a large sector of outdoor recreation in the United States and data is readily available on its overall economic impact. According to the National Marine Manufacturers Association (NMMA, 2010), in 2008, nearly 66 million people in the

United States went boating at least once, representing 28.3% of U.S. adults. In 2008 there were 5,284 recreational marine manufacturers which employed more than 135,900 people and generated $2.9 billion in revenue. There were also about 33,000 retail boating/service businesses, which employed another 217,718 people. In all, in 2009, recreational boating generated $32.5 billion in sales and services.

The economic impacts of other terrestrial forms of motorized outdoor sports, like snowmobiling and the use of off-highway vehicles have not been as well studied. In a handful of states, studies have looked at the economic impact of these sports, but there is no comprehensive overview of the collective impact of these activities on the national level. A Bureau of Land Management online PowerPoint® presentation (US BLM, 2006) states that "motorized outdoor recreation" contributes an additional $25 billion in total economic impact in 1998 but gives no source for this figure. This figure may relate to just BLM lands.

The national numbers are most likely much higher than the BLM estimates. In Arizona, for instance, an Arizona State University study (Silverman, 2003) based on a questionnaire survey found that off-highway vehicle recreation in 2002 accounted for nearly $4 billion in spending, which created a statewide economic impact of $5.23 billion, added $230 million to annual state tax revenues and supported 36,951 jobs in Arizona.

A similar study looking at the impact of off-highway vehicle recreation in four central Florida counties (Parent et al, 2007) found that combined resident and non-resident riders' expenditures for equipment and travel was $15.3 million in 2006. This amounted to $24.3 million in total output, indirect taxes of $2.40 million and provided 318 jobs in the region, a rural area of Florida where other forms of employment are scarce.

Based on studies like these, there is no doubt the outdoor motorized sporting community has a strong economic role in the United States, but further national level study is needed to measure this.

B. Nature Conservation

Natural resources conservation includes preserving natural ecosystems like wetlands, forests and meadows, conserving endangered and threatened species, protecting biodiversity, and all programs, projects and properties required to do so. Four main aspects of nature conservation have been addressed by economists:

1) The value of ecosystem services provided by natural areas,
2) The willingness-to-pay by residents and visitors to conserve various species,
3) The revenue accrued by visits to natural areas, and
4) Property values that are impacted by proximity to protected and natural areas.

All dollar figures reported here, unless otherwise noted, have been converted to 2011 dollars to account for inflation.

1. Ecosystem Services

Ecosystem services include all the functions performed by nature that provide benefits to humans. Basic services include climate regulation[1], waste treatment[2], water supply[3], carbon sequestration[4], nutrient cycling[5], habitat provision[6] and many others that all help modulate and regulate climate, weather and various resources needed for human comfort, security and well-being. Saltwater wetlands, freshwater wetlands, temperate and tropical forests, grasslands, lakes, etc. all provide different levels of a myriad of environmental services.

In recent years, the valuation of ecosystem services has blossomed into a booming academic field. Hundreds of papers on this topic appear in various technical and trade journals. But many of these are discussions of different ways to approach this task and do not provide quantified results. Just a few of them yield numbers that relate to more than a few specific sites but are typically focused on a limited set of dimensions. A variety of international online data bases attempt to catalogue these studies and more efforts are currently underway (McComb et al, 2006).

One benchmark study that initiated this burgeoning field of literature was produced by Costanza et al (1997). A group of renowned environmental economists gathered for a week with the express purpose of developing global numbers to represent the value of ecosystem services for all habitats on earth. Nearly 3,000 papers have cited the resulting

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[1] Climate regulation includes temperature and precipitation regulation and other overall impacts on the climate, locally and globally
[2] Waste treatment water purification, pollution control, etc.
[3] Water supply includes flood control, storage and replenishing of water, etc.
[4] Carbon sequestration is the capture of carbon dioxide and the regulation of atmospheric gases
[5] Nutrient cycling includes the capture, storage and recycling of necessary nutrients
[6] Habitat provision includes providing refugia for resident and transient populations of animals, plants, etc.

study and the numbers, adjusted for current inflation rates, appear in many articles. No other attempt has yet been made to reproduce these findings. For now, these numbers still represent the state of the art, although they are nearly fifteen years old.

In the United States, one recent study estimates the value of ecosystem services provided by the USFWS National Wildlife Refuges in the contiguous United States (Ingraham and Foster, 2008). Using 1992 land cover data, these researchers determined the extent of various habitats in all the refuges, including 13.3 million acres composed of about 27% shrubland; 18% wetland; 17% open water; 13% planted/cultivated; 11% grassland; 10% forest; 4% barren; 1% developed; and less than 1% perennial ice/snow. Following a thorough analysis of the literature, they calculated an estimate, essentially an average, for all relevant North American economic valuation studies for the major habitats represented in the National Wildlife Refuge System. This effort focused on a handful of major ecosystem services most widely analyzed in the economic literature: carbon sequestration, disturbance prevention (e.g., flood control), freshwater regulation and supply, waste assimilation and nutrient regulation and habitat provision. The total value of ecosystem services provided by the acreage of major different habitats in these refuges totaled $32.3 billion/year, or $2,900 thousand/acre/year.

When these figures were extrapolated to the contiguous 48 U.S. states (using U.S. 2006 National Land Cover Survey Data) and for all of the United States, including Alaska and Hawaii (using 2001 NLCS Data) it is evident that the contribution made to the environment by natural lands is far from trifling. In fact, the total amount of ecosystem services provided by these categories of natural land amount to about $1.6 trillion, which is more than 10% of the GDP in 2009 when land in the contiguous United States is tallied. Although Ingraham and Foster (2008) specifically did not include National Wildlife Refuges in Alaska and Hawaii (and these may have unique differences), if their numbers are extrapolated to these areas, the total amount of ecosystem services provided per year in the entire United States is more than $2 trillion. Results from the Ingraham and Foster study, in 2011 dollars and extrapolated to the contiguous United States, are presented in Table B1. These numbers only reflect terrestrial environments and do not include the sizeable contributions from surrounding seas.

Table B1: Ecosystem Services provided by Natural Habitats in the Contiguous U.S. States, based on Ingraham and Foster (2008) and using U.S. National Land Cover Survey Data (2006)

Classification	Dollars/ Acre	Acres in National Wildlife Refuges (millions)	Value of Ecosystem Services from National Wildlife Refuges (millions)	Acres in the Lower 48 U.S. States (millions)	Total Value of these services (billions)
Forest	$1,014.27	1.12	$1,132	498.18	$505.3
Shrubland	$660.13	4.58	$3,020	426.50	$281.5
Grassland	$61.67	1.39	$85	288.93	$17.8
Wetlands	$10,608.43	2.60	$27,536	102.23	$1,084.5
Total		9.69	$31,775	1,315.84	$1,889.2

When different land cover classes were separated in the Ingraham and Foster study of ecosystem services of National Wildlife Refuges, wetlands were found to provide the most services, about $27.5 billion annually or $10,600/acre/year. Costanza et al (1997) found a similar value for wetlands ($8224 dollars/acre/year) when their original numbers were converted from hectares to acres and in 2011 dollars. Costanza et al also individually detailed the different ecosystem services that wetlands provide. The economic estimates for these services are presented in Table B2. The loss of wetlands over the past few decades has resulted in a concomitant loss of ecosystem services.

According to the U.S. Environmental Protection Agency's Report on the Environment 2008, since the 1950s about 9.9 million acres of wetlands have been lost in the United States. As seen in Table B2, this represents an economic loss of more than $81 billion in all wetlands-related ecosystem services. When a similar analysis is run using the total wetlands ecosystem services values calculated by Ingraham and Foster, the results are comparable, showing a total loss of about $105 billion. Although Ingraham and Foster did not break down wetlands services into subcategories, their figures for wetlands services also fell into the same range. Whichever number is most accurate, it is clear that the total loss of ecosystem services from the loss of wetlands between the 1950s and now is substantial.

Table B2: The value of ecosystem services provided by wetlands, based on analysis of Costanza et al (1997) and amount of loss of these services since the 1950s

Ecosystem Service	**Dollars/acre/year**	**Value of Services lost from wetlands since 1950s (millions)**
Gas Regulation	$82	$812.29
Disturbance Regulation	$2,800	$27,721.93
Water Regulation	$9	$91.61
Water Supply	$2,344	$23,208.49
Waste Treatment	$2,577	$25,511.02
Habitat/Refugia	$188	$1,856.68
Food Production	$158	$1,563.52
Raw Materials	$65	$647.40
TOTAL Services	$8,224	$81,412.94

A similar analysis could be done for other natural areas in the United States, the different types of forests, lakes, deserts, grasslands, etc. Lack of conservation of natural resources presents a degradation of the ecosystem services these lands provide and an ultimate economic loss to society.

2. Value of Rare and Threatened Species

Another much smaller body of economic literature addresses the value of various species in the United States to residents and visitors to areas where these species are found. A recent meta-analysis of these studies [Richardson and Loomis (2009)] found that on a household basis, people would pay an average anywhere from $8 (striped shiner), $19 (sea turtle), $36 (bottlenose dolphin), $56 (whooping crane) up to $241 (Washington State anadromous fishes) annually in 2006 dollars to preserve populations of various rare, endangered or useful species (Table B3). Further analysis demonstrated that the amount people were willing to pay varied depending on if they were residents or visitors to an area where the species exists, the rarity of the species, the charisma of the species and a variety of other factors. It is unlikely that most households in the U.S. including those far from the habitat of the targeted species would pay such sums, so an aggregate number extrapolated nationally is not valid, but it gives some idea of the existence value people place on the wildlife around them.

Table B3: Summary of economic value of threatened, endangered and rare species based on a meta-analysis of willingness-to-pay studies by Richardson and Loomis (2009)

	Low Value	**High Value**	**Average of all studies**
Studies reporting annual WTP			
Bald eagle	$24	$50	$44
Bighorn sheep			$19
Dolphin			$40
Gray whale	$27	$52	$39
Owl	$44	$146	$73
Salmon/Steelhead	$11	$156	$91
Sea lion			$80
Sea otter			$45
Sea turtle			$21
Seal			$39
Silvery Minnow			$43
Squawfish			$13
Striped Shiner			$9
Turkey	$12	$17	$15
Washington state anadromous fish populations	$165	$349	$270
Whooping crane	$49	$77	$63
Woodpecker	$15	$22	$18
Studies reporting lump sum WTP			
Arctic grayling	$22	$29	$26
Bald eagle	$275	$392	$333
Falcon			$36
Humpback whale			$269
Monk seal			$186
Wolf	$25	$182	$68

Eagle and Betters (1998) used a similar analysis of some of the earlier willingness-to-pay studies and broke down the results per individual animal of each species considered, extrapolated to the national level. Thus, for instance, when the willingness to pay for maintaining whooping cranes ($44) was divided by the number of cranes alive in the wild at that time (109) and extrapolated to the national level, each individual crane had a worth to citizens of $36 million dollars. The authors used such calculations to make a case that the fines levied for illegal taking of endangered species are far less than the value these species have to Americans and the fines should be based on the rarity and value of each individual species, not a much smaller fine, uniform across the board.

3. Visits to Natural Areas

Other sections of this report look at overall values for outdoor recreation like hunting, fishing, boating, nature-viewing, etc. There is also a body of literature that relates specifically to the economic impact of various parks and reserves. Although much of this economic impact is due to outdoor recreation, other visitors may come to these areas for sight-seeing, for family gatherings, for educational benefits and for many other values not captured by the category of outdoor recreation.

In June, 2011 the U.S. Department of Interior (DOI) produced a report on their economic contributions and, among other things, provided current information on park visitation and the economic benefits accrued from these activities. For all of their bureaus combined, 439 million visits were made to DOI lands, which supported 388,000 jobs and provided more than $47 billion in economic activity. National parks, monuments and recreation areas, National Wildlife Refuges and Bureau of Land Management lands involve the most recreational visitors. These lands are also the ones most involved in natural resources conservation, another way of showing the impact that preserving these lands has on the economy.

Table B4: Visitors to Department of the Interior Lands (DOI, 2011) and their economic impact in 2010

	Recreational Visits	**Value of Recreational Visits (millions)**	**Estimated Economic Impact (millions)**	**Estimated Employment Impact (# of jobs)**
Bureau of Land Management land	58,643,712	$2,967	$7,715	58,947
National Parks, Monuments, Recreation Areas (NPS)	285,279,021	$12,356	$31,574	246,956
National Wildlife Refuges (USFWS)	44,849,524	$1,554	$4,138	32,564

One detailed study of visitation to National Wildlife Refuges (Caudill and Henderson, 2005) looked further into the impacts on the local communities around these reserves in 2004. In 2004, there were 36.7 million visitors who generated $1.64 billion of economic activity in regional economies, similar to the figures reported in Table B4 for 2010. Caudill and Henderson went further into their analysis and showed that about two-thirds of the total expenditures were generated by non-consumptive activities and not fishing (27%) or hunting (5%), which illustrates the value these natural areas have for passive enjoyment of nature. The authors also conducted willingness-to-pay studies to determine the value of these refuges beyond what it actually cost them to visit. They found that

visitors showed a consumer surplus of more than $1.3 billion, with $816 million of this amount attributed to non-consumptive visitation.

The value of National Parks to local communities was reported by Stynes (2011) in a detailed analysis. In 2009, visitors to National Parks spent $12.56 billion in "gateway" areas adjacent to the parks and more than 56% of the total spending was by visitors who stayed outside the parks. Nationally this visitor activity accounted for 247,000 jobs, $9.66 billion in labor income and $16.46 billion in value added. The local impact across all parks amounted to direct and secondary effects of 149,500 jobs, $4.56 billion in labor income and $7.74 billion in value added.

Seventeen National Monuments in the western states that have been established since 1982 were also the subject of a study on the impact on local communities (Headwaters Economics, 2011). Although the results varied, all of the communities showed an increase in economic growth after the monuments were officially designated. Similar results were found by Lorah and Southwick (2003) and others regarding healthier economic growth rates in communities adjacent to federally protected lands compared to communities dependent on extraction industries.

The Army Corps of Engineers also maintains some land that is in a natural state. In 1996, recreational visitors spent, $8.3 billion on trips within 30 miles of these sites, contributing $4.4 billion in direct income and supporting 180,000 jobs all in the local economy (Stynes et al, 1996). When the analysis was expanded to the national level, the results were even larger. The effects of the visits on the national economy were $34.0 billion in sales, contributing $17.1 billion in direct income and supporting 420,000 jobs.

In addition to all these federal lands, there are countless state parks and county parks that all preserve natural habitats and many, if not most, also charge admission. A myriad of individual studies exist for many of these parks, and their cumulative effect on jobs and expenditures as well as their total economic impact due to nature conservation and recreation is no doubt another highly significant factor to consider. The results of some of these studies are considered under the outdoor recreation section of this report.

4. Property Values

Another way to look at the value of nature conservation is to look at property values near protected areas, open spaces and other natural amenities compared to property values without such proximity. Unfortunately, there are no studies that look at the overall value of properties near national parks, wildlife refuges or other open spaces, just a myriad of single-site studies.

One such study (Neumann et al, 2009), for instance, looks at the property values near a National Wildlife Refuge (NWR) in central Middlesex County, Massachusetts compared to values near other types of open space, including golf courses, recreation parks, cemeteries, conservation land, etc. The authors found that properties closer than 100

meters to the NWR had property prices $1,075 higher than those further away. They found similar premium prices for proximity to golf courses and sports/recreation parks but found no such premium effect for those properties close to cemeteries and conservation areas—other forms of open space. This study focuses on a NWR in a suburban area and the authors are confident that these results can be applied to property values around other suburban NWRs. However, there is no simple way to determine how many of the 550 plus NWRs are considered to be "suburban" and therefore it is not possible to estimate the overall value contributed by NWRs on a national scale.

Another study looked at 20 years of research into property values near different categories of parks, from urban to specialized recreational parks, and included natural parks (Crompton, 2005). Overall, this study found a 20% increase in property values where properties are next to a passive park and suggests that these numbers can be used more widely to estimate the economic contributions of parks.

Lutzenhiser and Netusil (2001) were able to study Portland, Oregon and they show tangible benefits to property values for parcels in proximity to parks that were urban (with most of the area landscaped), natural (which are maintained primarily for wildlife and passive recreation like hiking and bird-watching) or specialty (maintained for only one purpose, i.e. boat ramps). The rates are presented below in Table B5. It is evident that those properties near the natural parks had the most increased value from this proximity, in some cases realizing nearly a 20% boost in property value because of their proximity to a natural park.

Table B5: Property value increases, as percentage of the average home value, for parcels in proximity to different types of parks in Portland, Oregon. Based on Lutzenhiser and Netusil (2001)

	Urban park	**Natural Park**	**Specialty Park**
Distances in Feet			
Less than 200	2.91%	16.93%	11.17%
201–400	3.11%	15.43%	8.68%
401–600	1.80%	19.07%	15.53%
601–800	1.23%	17.02%	8.55%
801–1,000	1.42%	13.57%	7.51%
1,001–1,200	2.55%	12.28%	6.89%
1,201–1,500	0.52%	15.08%	5.80%

These figures cannot be expanded to other areas of the country, but the 20% extra value determined by both the meta-analysis of many studies (Neumann et al, 2009) and the nearly 20% increase for some properties near natural parks give an indication of the overall increase in property values that are possible when the worth of neighboring natural areas are considered.

C. Historic Preservation

Historic preservation generates economic benefits in a number of ways, including the ripple effect through the economy due to restoration work, effects on property values in historic areas and districts, visitor and tourist spending, and other surprising features such as income through the film industry and other media seeking historically preserved sections of large and small cities across the country.

A number of papers have looked at the economic impacts of historic preservation in various cities and for select historical sites like Civil War battlefields. A comprehensive, national report was issued in 2010 by Rutgers University on behalf of the National Trust Community Investment Corporation (a subsidiary of the National Trust for Historic Preservation). This document provides the primary estimates on the economic returns from preservation efforts.

The Advisory Council on Historic Preservation (http://www.achp.gov/economic-statewide.html) provides an exhaustive bibliography of numerous state-wide studies showing the economic effects of historic preservation activities, but no overall summary of these findings is available, and for the most part the studies focus on different dimensions of the issue using different tools making them difficult to compare.

Two recent in-depth papers looking at historical preservation in Connecticut (Place Economics, 2011) and Philadelphia (Econsult, 2010) have ample data that is thoroughly analyzed and provides strong insight into the economics involved, at least in these two different areas. The results of these two studies form the basis of this review, with some added older studies providing similar examples. All monetary estimates are reported in 2011 dollars.

1. Rehabilitation Work

The National Trust Community Investment Corporation (Listokin and Lahr, 2011), based on reported use by communities, developers and other of federal tax credit provisions, were able to estimate the economic activity and impacts resulting from historic rehabilitation efforts. Table C1 presents a summary of the comprehensive results. Nationally, the federal tax credits returned more than $22.3 billion in federal tax dollars since 1978 on $17.5 billion in tax credits – a return of 27.4% from every dollar invested. This activity had an annual average impact on U.S. economic output of $6.6 billion, supports 61,200 jobs and generated $935 million in tax revenues.

Table C1: Total Annual Economic Impact of Historic Preservation Efforts Nationally, per Rutgers University (2010)

	Total Jobs	Total Income, or earnings	Total Output	Total Local, State, & Federal Tax Revenues
National Impacts	61,200	$2,390,000,000	$6,649,000,000	$935,000,000

A detailed study of economics and historical preservation and rehabilitation activities in Philadelphia (Econsult, 2010) found that the preservation work itself produced large scale economic benefits to Philadelphia and the rest of the state. In Philadelphia, various tax credits spurred more than $4.5 billion of private investment on historic preservation work between 1998 and 2008. This activity had an annual average impact of $662 million in total expenditures, supported 2,840 jobs and earned $107 million in earnings (salaries, wages and business profits) for the city of Philadelphia (Table C2). The citywide impacts included federal tax credit projects, investment by private owners, NGOs (non-governmental organizations) and residential conversion of homes.

On the statewide level, the Philadelphia rehabilitation efforts resulted in average annual impacts of $1.1 billion in total expenditures that supported 9,560 jobs and $366 million in earnings within the state of Pennsylvania (Table C3). Tax revenues from this work included $6.6 million local taxes for the city and an additional $25.3 million in tax revenues for the state.

Table C2: Total Annual Economic Impact of Various Historic Preservation Efforts in Philadelphia from Econsult Corporation (2010)

City of Philadelphia	Federal Tax Credit Projects	Investment by Private Owners	Investment by Gov. and NGOs	Residential Conversion of Historic Properties	Total Annual Impact All Project Types
Total Output ($ millions)	$224	$257	$67	$115	$662
Total Employment	960	1,100	290	490	2,840
Total Earnings ($millions)	$36	$42	$11	$19	$107
Total Local Tax Revenues ($millions)	$2.20	$2.60	0.7	$1.20	$6.60

Table C3: Estimated Total Economic Impact of Historic Preservation Efforts on the Commonwealth of Pennsylvania from 1998 to 2008 in 2011 Dollars (Econsult, 2010)

	1998-2008 Total	**1998-2008 Annualized**
Direct Expenditures (millions)	$4,679	$467
Indirect and Induced Expenditures (millions)	$6,763	$676
Total Output (millions)	$11,443	$1,143
Total Employment	95,630	9,563
Total Earnings (millions)	$3,666	$366
Total State Tax Revenues (millions)	$252	$25.3

The state of Connecticut has been in the forefront of recognizing the value of tax credits for historic rehabilitation in spurring economic growth and has three on-going tax credit programs: the Historic Homes Tax Credit, the Historic Structures Rehabilitation Tax Credit and the Historic Preservation Tax Credit. The results of a recent study into the economic effects of these enhancement programs from 2000 to 2010 has been thoroughly analyzed (Place Economics, 2011) showing a considerable impact in various economic indicators listed below.

Table C4: Historic Preservation in Connecticut: 2000-2010 (Place Economics, 2011)

$46 Million	Private sector investment in historic buildings
$251 Million	Direct salary and wages in Connecticut from rehabilitating historic structures
$133 Million	Indirect salary and wages in Connecticut from rehabilitating historic structures
$15.1 Million	Personal Income Taxes from rehabilitating historic structures
$15.7 Million	Grants to local governments and non-profit organizations
$11.2 Million	Sales Taxes from historic preservation projects
$8.1 Million	Increased property taxes to local governments each year
$2.1 Million	Business Income Taxes from rehabilitating historic structures
4,144	Direct jobs in Connecticut from rehabilitating historic structures
2,293	Indirect jobs in Connecticut from rehabilitating historic structures

Similar situations arise in other states where rehabilitation of historic properties has been studied. For instance, in the state of Texas, in 1997 rehabilitation efforts created more than 4,200 jobs in Texas and overall historic preservation activities created more than 40,000 jobs in the state that year (Center for Urban Policy et al, 1999). In Nebraska an average of $46 million spent on statewide historic rehabilitation per year from 2001 to

2005 resulted in 1,004 jobs and an additional $31 million in income and $45 million in GDP at the national level (Lahr, M. and D. Listoken, 2007).

A few studies also look specifically at the amount of return from tax credits for historic redevelopment. In the State of Maryland, for instance it was found that tax incentives stimulated an $8.53 return from private sources on every state dollar invested (Cronyn, J. and E. Paull, 2009).

Another case study (Billington, 2004, 2005) looks at leveraging federal funds to gain more private sector investment in one of the 23 National Heritage Areas managed by the U.S. National Park Service. In the Blackstone Valley National Heritage Corridor in Massachusetts and Rhode Island from 1984 (when the National Heritage program began) to 2003, the National Park Service invested about $15 million, which generated nearly $8 million in additional private sector funding for particular projects (neither figure adjusted for inflation).

Overall, the U.S. National Park Service invested $107.2 million into the 23 National Heritage Areas from 1984 to 2003 generating $261.7 million in private sector investment (again neither figure adjusted for inflation)--a return of more than two dollars for every one dollar of National Park Service funding invested here.

On the national level, Listoken et al (1998) compares the economic return on different types of activities and found that when compared to book publishing, pharmaceutical production and electronic component production, for instance, the economic impact from residential historic rehabilitation ranks highest in major economic measures.

Table C5: Economic Impacts per Million Dollars of Initial Expenditure

Economic Effect (National)	**Residential Historic Rehabilitation**	**Book Publishing**	**Pharmaceutical Production**	**Electronic Component Production**
Employment (jobs)	36	35	28	30
Income	$1,240,000	$1,160,000	$1,045,000	$1,018,000
GDP	$1,672	$1,722	$1,546	$1,483
State taxes	$106,000	$103,000	$93,000	$87,000
Local taxes	$89,000	$86,000	$79,000	$74,000

Additionally, historic rehabilitation represents the majority of central city construction in Baltimore, St. Louis, San Francisco and Washington D.C., bringing new life and economic return to older areas. Increasingly former factories and other "brownfield" areas are also being converted to apartments and townhouses, while retaining their historic exteriors in many cities in the country, leading to economic development in these once-blighted areas, which are often situated in scenic areas like riverfronts.

2. Historic Tourism

In the United States, heritage tourism has been found to be a lucrative market attracting well-educated and well-heeled visitors that spend more than other tourists. A recent study commissioned for the U.S. Cultural & Heritage Tourism Marketing Council (Mandala, 2009) was able to provide numbers for these assertions. This study found that the 78% of national vacationers who participated in heritage and cultural activities accounted for 90% of the economic impact of domestic tourism. Heritage travelers traveled more frequently than others and spent an average of $1050 per trip, contributing more than $203 billion annually to the U.S. economy. A number of studies have looked at the economic impact of different historical sites and regions across the United States echoing similar findings about the relevant affluence of historic visitors and the far-reaching effects of their visits on local or statewide economies, too numerous to be fully examined here.

Philadelphia is a city renowned for its historic preservation activities, spurred by U.S. National Park Service facilities and exhibits and enhanced by private enterprises, and has been relatively well-studied in this regard. Laurie (2008) refers to an older paper by Rypkema and Wiehagen for the Preservation Alliance for Greater Philadelphia which found that heritage visitors spend 45% more than other visitors and spend an average of 4.7 nights, compared to 3.3 nights for all U.S. travelers. Unfortunately, this study is no longer available for direct reference. However, the Preservation Alliance for Greater Philadelphia has continued to fund work showing economic benefits from heritage tourism. In a recent report for the Alliance (Econsult, 2010), the researchers found that heritage tourism in Philadelphia and nearby areas contributes $3.5 billion in total output, supporting over 45,000 jobs and $1026 million in earnings in Pennsylvania each year.

The economic value of visits to Civil War battlefields has also been studied recently (Harbinger Consulting Group, 2011) (Table C6). These studies measure different parameters but the major findings are summarized below.

Table C6: Representative impacts to local communities from visitation to Civil War sites in the United States (Harbinger Consulting Group, 2011)

Area	**Number of Visitors**	**Income/Wages**	**Jobs Support**	**Value added (rents and taxes etc)**
MO/PA/SC/TN/VA NPS affiliated Civil War battlefields and historic sites (2008)	15 million	$147 million	7,700	$230 million
Journey through Hallowed Ground National Heritage Area (2007)	7 million	$92 million	5,100	N/A
20 Civil War battlefields with survey data (2003-2005)	N/A	N/A	N/A	32.7 million

Civil War attractions include more than just National Park Service managed sites. In Missouri, Pennsylvania, South Carolina, Tennessee and Virginia, all states with major Civil War activity, more than 20 million people visited various Civil War attractions in 2009, resulting in large scale economic benefits throughout the area.

Natural Heritage Areas that are managed by the National Park Service also draw visitors and their dollars to surrounding communities. In one study (Stynes and Sun, 2004), it was found that 25,000 visitors in 2003 to seven National Heritage areas spent on average $123 each, adding up to $3.1 million locally, which supported 51 jobs, $960,000 in earnings and $1.5 million in value added (indirect taxes, profits, rents, etc.).

3. Property Values

Overall, a number of studies demonstrate that the property value of homes in historic districts increase once historic status is granted to the community. In a thorough, recent study of historic properties in Philadelphia (Econsult, 2011) it was found that homes within a national historic district showed a premium price of 14.3 percent and those within a local historic district received a premium of 22.5 percent over the value of homes outside these districts. Those homes in local historic districts in Philadelphia appreciated one percent more per year than other homes.

The Econsult team analyzed data from other studies as a background for their work in Philadelphia. One study from the Office of the Budget in New York City found that from 1975 to 2002, historic properties increased an average of 10.2 percent per year, while other properties only grew 9.0 percent per year. Another study in Beaufort, South Carolina analyzed by the Econsult team showed that an average house in the historic district sold for 21% more than a similar house outside the district. In Texas, cities with active historic preservation programs showed an increase in property values of 20% (Center for Urban Policy et al, 1999). Other similar studies exist for a number of localized areas around the country.

4. Other Economic Benefits

Historic preservation activities reap other economic rewards in addition to increased property values, revenue from tourism and the direct result of construction and restoration activities. One sector that has been analyzed is the value of historical neighborhoods from the film-making industry.

The city of Philadelphia reaps rewards from its preservation of large blocks of historic buildings and various historic sights as a location for films, television shows and other media requiring historical backdrops. About $116 million was reaped in direct spending in Philadelphia accruing from the film-making industry in 2007, an amount that has

steadily increased from $31 million in 2000 (Econsult, 2010). Laurie (2008) reports that one particular movie filmed in Philadelphia, *Beloved*, for instance, brought $15 million direct economic impact to the city. These numbers are as given and not adjusted for inflation to 2011 dollars.

Even venues smaller than Philadelphia can gain economic benefits from the movie industry through their historic preservation activities. For instance, Asheville, North Carolina has drawn movie makers looking for historic locations. From 1980 to 1997 (Rykema, 1988) direct expenditures of over $4.6 billion have come to the town through the film industry, which chooses this venue in part for its historic buildings but also enhanced by its scenic location in the Appalachian Mountains.

There are many small studies of particular historical areas and their economic impact on property values, but, as with other aspects of this report, there are no generally accepted overall figures for these areas across the nation as a whole.

D. The Department of the Interior

In December, 2009, the Department of the Interior (DOI) published it's first-ever report, a preliminary one, on the "Economic Impact of the Department of Interior's Programs and Activities." In June, 2011 this report was released as a final report, "The Department of the Interior's Economic Contributions," with numbers updated through 2010. DOI is the U.S. agency most directly involved in natural resources conservation and their findings are relevant to this report. Monetary amounts are reported in 2011 dollars.

Key findings relevant to this review are:

- Overall, in 2010 DOI provided more than 2.2 million jobs for Americans, which generated $377 billion in economic activity.

- About 439 million visits were made to DOI land—national parks, monuments, recreation areas, fish and wildlife refuges, etc. These visits supported more than 388,000 jobs and contributed more than $49 billion in economic activity. This amounts to about 8% of the direct output of personal consumption tourism expenditures in the U.S. and about 1.3% of direct tourism related employment.

- Water, timber and forage activities on DOI land supported about 370,000 jobs and $50 billion in economic activity.

- About $2 billion was spent on construction and maintenance activities related to recreation and conservation, which supported about 41,000 jobs and contributed about $5.7 billion in economic activity.

- $222 million that was spent by DOI on land acquisition was estimated to contribute about $457 million in economic activity and support about 3,000 jobs.

- The U.S. Fish and Wildlife Service contributed about $4.2 billion in economic activity and supported over 32,000 jobs through their management of 553 National Wildlife Refuges and thousands of smaller natural areas in the United States.

The DOI report gives an overall synopsis of all DOI activities and includes details for topics beyond the realm of natural resources conservation. It does not look into other areas of economic relevance, including the value of ecosystem services, property values around natural lands and other aspects relevant to this study. It also appears to not consider the multiplier effects or economic activity occurring outside of DOI lands as a result of recreational activity on DOI lands, though such ex-situ impacts are considered for commercial activities such as energy extraction. Data from the DOI study are included in relevant sections of this report. Other sections of this paper attempt to give an

overview of the benefits to many other stakeholders in the United States, above and beyond the efforts of a single U.S. Agency.

E. Gap Analysis and Next Steps

As this study shows, there are a number of older and more recent papers regarding various aspects of the economic side of outdoor recreation, nature conservation and historic preservation, but few studies encompass the entire United States. Most studies either deal with single sites or categories of sites, or detailed discussions of different methodologies, but overarching studies are rare. In this section we identify some of these gaps and some ideas for further study that is needed before the entire impact of these fields can be determined.

1. Overall Gaps

One major gap in the literature for all three topics regards the impact on property values for parcels based on relative location to conservation areas, recreation areas and historic areas. Regional and national averages are needed in each sector to define the overall value of these areas to the economy. Similar methodology could encompass the entire spectrum of these properties to make comparisons easy.

Another overarching gap in economic studies at the national level is the impact of state and local parks. These parks fill a variety of needs including nature conservation, historic preservation and outdoor recreation, and a single study of state parks could detail the economic effects of all of these statewide, regionally and nationally.

Additional efforts can be made to identify the return on future recreation, conservation and historic preservation investments. Initial data needed for such an evaluation tool or method were seen in the results of this review. A formalized effort can be made to provide ratios or other measures that would help identify the potential jobs, tax revenues and other economic returns from possible public dollar investments.

2. Outdoor Recreation

Thanks to the Outdoor Foundation, there is a complete breakdown of the statewide, regional and national economic impacts from a number of traditional outdoor recreations, including bicycling, camping, fishing, hunting, paddling, snow sports, trail use and wildlife viewing.

Unfortunately there are other outdoor sports that are not included in this report. One large gap is in motorized outdoor activities like the use of off-road vehicles,

snowmobiling, dirt bikes, etc. A similar study is needed to quantify the economic impacts from these activities at the national level. Similarly, although on a smaller scale, nontraditional activities like hang-gliding, parasailing and other activities need coverage as well.

The overall impact of outdoor recreation can also be measured by the increased revenue from visitors in communities surrounding recreational areas, by the impact on property values of homes near recreation areas and other means. Only a handful of studies, however, detail these economic effects from recreation.

3. Nature Conservation

Determining the economic effects of nature conservation has some similarities with the study of the economic effects of outdoor recreation and in some cases the same studies can do double-duty, especially when the effects of visitors to refuges and parks are concerned. These visitors come to these areas in large part to enjoy their outdoor recreational pursuits. The land reserved for these activities also plays a large role in the conservation of natural resources in the United States.

But, as with the analyses of outdoor recreation, most of the studies of visitors and residents and the impact on their homes and communities come from single sites or a handful of sites with particular characteristics. More studies at the national level are needed to better elucidate the overall economic impact from conserving natural lands.

Updated and more-thorough estimates on current values for ecosystems from various types of habitats and combined values are needed. Current values are old, and limited. The science is available to assign such values, but funding has not been available.

Another area that could use more analysis is the study of forests in the United States—the types of forests, the extent of these forests, and the ecosystem services that forests provide on a national level. Similarly, the amount of land converted from natural lands to agriculture and municipalities (which add little to the world's ecosystem services) could be analyzed to show the loss of these services over time and the amount that it costs to make up the difference.

4. Historic Preservation

The historic preservation impacts are well represented by Listokin and Lahr (2011). Additional work may be needed to better identify local efforts. The biggest need relates to historic tourism. A scattering of such studies related Civil War battlefields and others are available, but few look at the impact on the regional or national levels.

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Senator CARDIN. Well, I thank all three of you for your testimony.

First, let me just ask a general question on the conservation bills, five specific, and then you also added the range issue in our parks. Do I understand from Dr. Inkley and Dr. Schildwachter, from your testimonies, that you support these conservation bills? Are there any amendments or any changes that you would want to see us consider, or are you satisfied by the way they are drafted and you give basically unqualified support for those five bills, in Dr. Inkley's case, six bills in Dr. Schildwachter's case?

Mr. INKLEY. Go ahead, Greg.

Mr. SCHILDWACHTER. Yes, sir. I am on board. I would only add that another feature that I would urge the Senate to consider as they are looking at these programs with the cost share basis and the matching funds and the mechanisms by which they work in that these programs really need to be prized as we do the necessary work of balancing the budget because the programs not only leverage dollars from the private sector, but in creating the infrastructure as I described, they also become places where sales of services and equipment can then proceed and in their way contribute to economic recovery as well.

Mr. INKLEY. Thank you for asking. Yes, we do support these wildlife bills and their passage.

The one bill, Wildlife Disease Emergency Act, S. 357, we would like to see several discussions pertaining to some possible amendments. One of those is that the bill currently would apply only to native species, and while invasive species are a huge problem in this country, invasive species also can carry disease which may be transmitted to native species. So, it would seem appropriate that this bill also apply to some of the non-native species that may present a problem by carrying diseases to native species.

Second, we would like to see the definition of the Wildlife Disease Committee, or the members of that committee, further defined to make sure there is a balance of government and non-government members on that committee to make recommendations. Those are our two primary recommendations for the wildlife——

Senator CARDIN. Well, we thank you for that. I would seem to me that if an invasive species disease is affecting native species that it would probably be covered under the provisions. But it is a point that might be worth us reviewing.

Mr. INKLEY. We would like to see that clarified, sir.

Senator CARDIN. OK. Thank you.

The point about the economic issues is right on target. I mean, we do look at conservation as helping, first of all, the economic activities that you have already talked about. So, we do see this as a plus on the economic side.

What we want to make sure is that the monies that are being generated are used for their intended activities; they are not taken for other purposes. We have had a great track record on all of these programs. The funds have actually gotten to their intended use, and we would certainly want to make sure that continues as we look at reauthorizations or expansions of the different conservation programs.

Dr. Wasserman, let me turn to the chimpanzee issue for a moment, if I might. I think you have been pretty clear about your position. It does seem to be contrary to what the National Institutes of Health are suggesting to us and that is that there could be a potential use of chimpanzees for research in the future and therefore that capacity needs to be maintained, admittedly at a different level and under different protocols for future use that we have been using currently, but that there is this ongoing potential need that we would not want to see legislation prevent. I take it you disagree with that?

Dr. WASSERMAN. Not completely, Senator Cardin. First of all, thank you for having this hearing and for considering this subject, which is so important.

We met in your office and you expressed a similar concern. In reviewing the Institute of Medicine report, they brought in biodefense testimony just on this specific question, what if there is an emergency—you have to have chimpanzees available.

During that discussion, it was stated that we could never consider, never consider where that emergency could come from because using a chimp, it takes so long for a chimpanzee to respond, and we have so much better and more viable non-chimpanzee models to use.

Nevertheless, I recognize the concern that you express and that others have expressed, and there has been an amendment that has been submitted that under certain situations, with transparency, with an opportunity for public comment, then we think that the public's health could be protected and the inclusion of that amendment should satisfy those concerns.

Again, I must reiterate that all of the research and all of the testimony suggested that there is really no need for the chimpanzee model. We are not talking about other animals at this point because this bill is exclusively focusing on chimpanzees.

I could go through a litany of differences between how the chimpanzee as a biological model differs from the human despite the sharing of genetic materials. And particularly in hepatitis C and HIV research, which is why we had so many chimpanzees in the past several decades, it was learned that chimpanzees could be infected with HIV but the disease does not progress to AIDS the way it does with humans.

In testing approximately 85 promising vaccines in chimpanzees, there were 200 clinical experiments in humans, none of which proved fruitful. And in fact, that is how one wastes time in doing research where we focus on the wrong model and spend unnecessary time on it.

So, we feel very confident that there will not be the need for chimpanzee research in any kind of a public health emergency and would urge that we do not amend this legislation in a way that could be taken abuse of and not really effectuate what this legislation proposes to do.

Senator CARDIN. Well, I thank you for that. And while we appreciate the spirit of the amendment that you are suggesting, we will wait to see. We will not wait long. And Dr. Anderson indicated that he will have written comments to us, I think he said timely. We would welcome your thoughts as we get additional information, not

only from the National Institutes of Health but also from the Institute of Medicine as they are looking at ways of transitioning to a new policy. We would welcome your response to that information.

Dr. WASSERMAN. Thank you. I would be delighted.

Senator CARDIN. Thank you. Let me point out that the record of the Committee will remain open for 2 weeks. That allows for questions by members of the Committee to our witnesses. It is more likely we are going to get questions for the first panel, but it could also be for the second panel. We ask that if there is a written request for information that you respond to that in a timely fashion.

I would also point out that we have received written testimony from Ducks Unlimited, National Fish and Wildlife Foundation, the National Environmental Coalition on Invasive Species, the Humane Society, and the American Society for the Prevention of Cruelty to Animals. Without objection, their statements will be included in our records as well as, as pointed earlier without objection, the full testimonies of all of our witnesses today.

Once again, I want to thank you all for your cooperation.

And with that, the Subcommittee will stand adjourned.

Thank you.

[Whereupon, at 12:18 p.m., the Subcommittee was adjourned.]

[The referenced testimonies follow:]

STATEMENT FOR THE RECORD OF DUCKS UNLIMITED, INC.

BEFORE THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WATER AND WILDLIFE SUBCOMMITTEE
APRIL 24, 2012

CONCERNING:
S. 2282, THE NORTH AMERICAN WETLANDS CONSERVATION EXTENSION ACT OF 2012
S. 2156, THE MIGRATORY BIRD HABITAT INVESTMENT & ENHANCEMENT ACT
S. 2071, THE PERMANENT ELECTRONIC DUCK STAMP ACT OF 2012
S. 1494, THE NATIONAL FISH & WILDLIFE FOUNDATION REAUTHORIZATION ACT OF 2011
S. 1249, THE TARGET PRACTICE & MARKSMANSHIP TRAINING SUPPORT ACT
S. 1266, THE DELAWARE RIVER BASIN CONSERVATION ACT OF 2011

We appreciate the opportunity to provide information regarding reauthorization of the North American Wetlands Conservation Act, amendment of the Migratory Bird Conservation Stamp Act, granting of authority to the Interior Secretary to issue electronic duck stamps, reauthorization of the National Fish and Wildlife Foundation, amendment of the Pittman-Robertson Act regarding public target ranges, and the creation of a restoration program affecting the Delaware River Basin. Ducks Unlimited appreciates the consideration of the Committee on these bills.

Ducks Unlimited has been a strong and active proponent of waterfowl conservation for 75 years. Our mission is to conserve, restore, and manage wetlands and associated habitats for North America's waterfowl, and for the benefits these resources provide other wildlife and the people who enjoy and value them. We work in Canada, Mexico, and throughout the United States, and since 1937, DU has conserved more than 12.7 million acres of habitats important to waterfowl.

With more than a million supporters, Ducks Unlimited represents a significant conservation voice for waterfowl and the landscapes that support them. Our work is science-based. We use reliable information from disciplines of wetland ecology, waterfowl biology, hydrology, civil engineering, social science, and landscape ecology to develop, implement, and adapt waterfowl conservation actions. We work in partnership with agencies, organizations, and private landowners in the most important landscapes used throughout the waterfowl lifecycle including breeding, migration, and wintering habitats. These kinds of partnerships are essential for efficient and effective conservation, and we support legislation and policy that advance these efforts.

S. 2282, TO REAUTHORIZE THE NORTH AMERICAN WETLANDS CONSERVATION ACT:

Ducks Unlimited (DU) is pleased to testify before the Environment and Public Works Committee on the fifth reauthorization of the North American Wetlands Conservation Act (NAWCA). Since enactment, NAWCA has played an invaluable role in wetlands conservation in North America by helping to stimulate local partnerships aimed exclusively at habitat

conservation for wetland-dependent species and the many people who take enjoyment from them. NAWCA continues to be an extraordinarily popular program among those involved. We commend Congress for its foresight in creating NAWCA in 1989 and repeatedly taking action to ensure the long-term success of this important program.

Since its enactment in 1989, NAWCA has accomplished measurable success in all 50 states, Canada, and Mexico. The creation of the program over 22 years ago was a bipartisan effort, and NAWCA has consistently attracted strong bipartisan support in Congress. Presidents of both parties have signed legislation relating to NAWCA and sought appropriations to support it. This program has enhanced more than 7 million acres across the United States and many more in the breeding and wintering habitats in Canada and Mexico. Reauthorization of NAWCA is critical to build on this success and ensure the conservation of high quality wetlands in the United States.

NAWCA is a model program for engaging partnerships and leveraging federal funds. More than 4,500 separate NAWCA partners have come together to implement more than 2,216 on-the-ground, voluntary conservation projects with multiple benefits for wetlands, wildlife, and people. The multi-sector list includes all 50 state fish and wildlife agencies, hundreds of private landowners, a diversity of conservation organizations, small businesses, corporations, tribes, and local governments.

In addition to being one of the federal government's most effective conservation programs, NAWCA is a model of fiscal responsibility as it provides an excellent return on a relatively modest federal investment. The law requires every federal dollar put into the program to be matched by at least $1 in non-federal money. ***On average, partner match has been $3.20 for every $1 in federal money.*** The partner investment in NAWCA totals more than $3.5 billion during the life of the program. In FY 2011, a total of 108 projects were approved for the United States, Canada, and Mexico—94 in the United States, 6 in Canada, and 8 in Mexico.

Historically, the lower 48 states of the United States have lost approximately 53% of their original wetlands. The state of California has lost a staggering 91% of its original wetlands and Maryland wetland loss is 73%. Oklahoma has lost two-thirds of its wetlands to agricultural, industrial, and residential development. While NAWCA has helped to replace some wetland losses, the most recent study of wetland trends showed that the net loss of wetlands across the United States increased by 140% between 2004 and 2009. The need for this voluntary wetland conservation program has never been greater.

NAWCA facilitates efforts by resource managers and multi-sector partners to use a variety of strategies to restore and enhance degraded habitat along with protecting the quality habitat that remains. The habitat work that is completed on both public and private lands improves recreational opportunities and often provides additional economic benefits for landowners and their communities. Wildlife-related recreation such as hunting, fishing, and wildlife watching generates over $100 billion of economic output each year. In many cases, this economic activity is vital to the incomes of rural Americans and creates jobs that cannot be exported.

The economic, social, and wildlife conservation benefits of this program make it the model for "good government". The restoration and protection of wetlands and associated habitats made

possible by NAWCA has many benefits for both people and wildlife. Scientific studies clearly demonstrate that wetlands not only recharge groundwater supplies but also act as filters to help purify water. Wetlands also trap and hold precipitation and runoff, and act as buffers in coastal regions, lessening damage from floods and hurricanes.

In Alabama, for example, 4 NAWCA projects have been completed in the Mobile-Tensaw Delta. These lands are now accessible for hunting, fishing, boating conservation education, camping, research, bird watching, and canoeing. $4 million in NAWCA funds have leveraged over $18.5 million in partner funding, a match rate of over 4.5:1. Over 47,000 acres of wetland and upland habitat have been conserved using these dollars. In Maryland, 17 projects have enhanced over 44,500 acres of habitat. Using over $11 million in federal funding, partners were able to raise nearly $49 million in private funding in areas such as Blackwater National Wildlife Refuge and the Pocomoke River.

Undeniably, the benefits of NAWCA extend well beyond waterfowl. Wetlands provide a home for more than 900 wildlife species at some time during the year and approximately 6% are waterfowl. As intended by Congress, the criteria for NAWCA projects include waterfowl as well as other wetland-associated migratory birds and threatened and endangered species. Under this guidance, NAWCA projects are benefitting a diverse array of species, including fish and mammals.

NAWCA serves as a vital tool for cooperative efforts to address landscape-level habitat challenges in vital areas for waterfowl, including inland wetland systems such as the Prairie Pothole Region of the Great Plains and the Lower Mississippi River Valley, as well as iconic coastal communities such as the Chesapeake Bay, Gulf Coast, and Great Lakes, to name a few.

What began as a funding mechanism to accelerate implementation of the international North American Waterfowl Management Plan between the U.S., Canada, and Mexico in 1989 has become a highly successful program with widespread success and support. NAWCA has stimulated hundreds of conservation partnerships that would not exist otherwise. The result is millions of acres of habitat conserved that provide myriad benefits for wetlands, wildlife, and the public.

NAWCA is the most effective wetland restoration program in the country. We strongly support the legislation and urge the Committee to reauthorize NAWCA for an additional five years with annual appropriations of up to $75 million.

S. 2156, To Amend The Migratory Bird Conservation Stamp Act:

Ducks Unlimited supports the increase in the price of the Federal Migratory Bird Conservation and Hunting Stamp, commonly referred to as the Federal Duck Stamp. The value and efficiency of this conservation program are noteworthy and our membership supports it. This legislation would permit the Secretary of the Interior to set the price of the Federal Duck Stamp, in consultation with the members of the Migratory Bird Conservation Commission.

The price of the stamp has not increased since 1991. During that timeframe, the buying power of duck stamp revenues has not kept pace with the cost of wetland and upland acreage. Since its inception in 1934 (when the price was $1), its buying power has never been lower than it is today. While other products have dramatically increased in price, the duck stamp has remained at $15. Land prices have doubled and tripled across much of the prairie Duck Factory, rendering today's duck stamp revenues less than half as effective in conserving habitat as in the early 1990s. The price increase will allow duck stamp revenues to keep pace with the consumer price index and would help address rising conservation costs associated with increasing land values.

The nearly 1.4 million "Duck Stamps" purchased annually are a significant part of the waterfowl conservation picture. Waterfowl hunters have been the primary purchasers of these stamps year in and year out, and want to see it continue to contribute to this effort. The stamp has raised hundreds of millions of dollars since it was introduced in 1934 and more importantly, has conserved more than 5.2 million acres of migratory bird habitat across the United States.

Waterfowlers are an economic "driver" in the U.S., responsible for more than $2.3 billion in total economic output per year. Their participation in waterfowl hunting ensures an essential source of conservation revenue and they are an important source of policy support, and serve as the foundation for important hunting traditions. An average of $854 was spent by waterfowlers who hunted both ducks and geese according to estimates from the 2006 National Survey of Fishing, Hunting, and Wildlife-Related Recreation (http://wsfrprograms.fws.org). As a proportion of total expenditures, the duck stamp accounted for less than 2% of the dollars spent on hunting equipment, dogs, travel, food, lodging, and other trip costs in 2006. Waterfowlers are conservationists and want to ensure that these opportunities exist for generations to come.

Any increase in Duck Stamp price may result in an immediate, but temporary, decrease in the numbers of stamps sold. In the past, reductions averaging 5% have occurred after a stamp price increase; however, sales recovered nearly to previous levels following these price increases. An increase in stamp price will result, however, in an increase in revenue, especially if hunter numbers remain at levels similar to recent years or hopefully, increase over time.

Communication must be integrated as part of the proposal to increase the price of the duck stamp. Ducks Unlimited is a key part of this effort. DU voluntarily assists in communications efforts promoting the federal duck stamp contest as well as duck stamp sales to generate more support for waterfowl and wetlands conservation. In fact, we have encouraged our members to buy two or more stamps this year to voluntarily support this habitat conservation.

Each year, about 20 percent of all duck stamps are purchased by individuals who do not hunt waterfowl that particular year. Many of these stamps are bought by collectors and avid conservationists who support habitat programs funded by duck stamp sales. It is appropriate that wetland and waterfowl enthusiasts – hunters and nonhunters alike – support the stamp price increase because the habitats acquired and protected with duck stamp revenues benefit far more species than ducks and geese. Wetland and upland habitats provide hundreds of species of resident and migratory birds, mammals, fish, reptiles, and amphibians with vital habitat. Conservationists, whether they hunt or not, can make a difference with each duck stamp they purchase.

DU has some level of reservation regarding the provision allowing the Secretary to waive the requirement that certain individuals purchase a federal duck stamp. While there might be situations where exemptions or waivers are warranted, we are concerned that such a provision might open the door for numbers of exemptions to be requested in the future. We believe that any waivers should be extremely limited in nature and have a de minimus effect on overall receipts.

This legislation will enable the Secretary of the Interior to set the price of the stamp to keep pace with rising land prices and provide adequate revenue from sales to support the original intent of the program. The Secretary will make any decisions regarding stamp price under the advisement of the Migratory Bird Conservation Commission, which is made up of four members of Congress and three members of the Cabinet. All the Commission members are intimately familiar with the duck stamp program, and well qualified to determine whether the price of the federal duck stamp should remain steady or be raised. They are staffed by property appraisers and other real estate experts. Ducks Unlimited supports both this legislation and efforts by the Congress to authorize an increase in the price of the duck stamp.

S. 2071, To Allow The Interior Secretary To Issue Electronic Duck Stamps:

For generations, waterfowlers have paid for conservation programs and the Duck Stamp is a good example of the effort to invest in the resource we care for. As seen above, funds from the purchase of this stamp go towards acquiring land beneficial to the public and waterfowl across the country.

Duck stamps are used by every waterfowl hunter over the age of 16. Traditionally waterfowlers could buy their stamps at post offices if they were in stock, and some stores selling sporting goods would buy a quantity to re-sell as a convenience to their customers. When the internet became popularized they could also buy their duck stamps on-line through a contractor known as Amplex that serves as a USPS fulfillment center. However, if bought online then, the purchaser had to wait until their stamp was mailed in order to use it for hunting.

Six years ago, the Electronic Duck Stamp Act (Act) was passed, making it possible to buy a federal duck stamp over the internet, and immediately go afield, and to make it easier for federal duck stamps to be sold to the public. Duck stamps are not always available at small rural post offices and even some larger ones, and are sometimes difficult for waterfowl hunters and collectors to purchase over the counter. This often happens later in the season when stores sell out of the supply they may have purchased earlier in the hunting season. Under the Electronic Duck Stamp Act, if a stamp is bought over the internet, the purchaser is given a special receipt valid for up to 45 days, which can be used while hunting in place of the actual stamp, giving sufficient time to mail a physical stamp to the purchaser.

It is important to note that even if a purchaser buys his/her stamp in this manner, they will still receive an actual stamp in the mail. We have concerns that if a physical stamp was not issued to the purchaser, the value of the federal stamps as collectors' items and a long and important

tradition could be lost and have a potentially negative effect on sales. This loss of value did occur to some state duck stamps when they were made available electronically, and the tradition and artistic value of the federal duck stamp program is too strong to risk losing. This has not happened, however, to the federal stamp, thanks to the fulfillment requirement of the Act.

The trial that was arranged under the Electronic Duck Stamp Act legislation has worked. Federal stamps are now available instantly over the internet, yet due to the requirement of fulfillment, it has not made the stamp just a novelty item. The integrity of the system is secure. Because of its success in making federal duck stamps easier to obtain while preserving the heritage and utility of the traditional stamps and attendant art, Ducks Unlimited supports the proposal to make this program permanent.

S.1494, To Reauthorize The National Fish And Wildlife Foundation:

Established in 1984 by the Congress, the National Fish and Wildlife Foundation (Foundation) was created to facilitate and develop private investments to conserve fish, wildlife, and their habitats. The Foundation has been very successful in linking private partners with federal agencies in order to build strategic partnerships. These partnerships have addressed some of the most significant threats to fish and wildlife populations and their habitats, and done so successfully. Ducks Unlimited supports the reauthorization of the National Fish and Wildlife Foundation and appreciates the Committee's continued support of S.1494.

The North American Waterfowl Management Plan (NAWMP) is an international strategy and plan for action for conserving and restoring migratory waterfowl populations throughout the continent. Developed in 1986, NAWMP involves many partners such as federal agencies, states and local government, corporations, non-profits, and private individuals. NFWF was a critical partner with DU and state fish and game agencies during the early years of implementation of the NAWMP and worked with DU and states to deliver initial funding to jump start its implementation.

As grant recipients and partners of the Foundation, DU recognizes the important role of the Foundation in leveraging federal funds with private sector contributions to conserve fish, wildlife, and their habitats. For more than 27 years, the Foundation has been a vital source of funding for voluntary, non-regulatory, on-the-ground conservation efforts that directly benefit the sporting community through improved fish and wildlife populations and hunting and angling opportunities. As directed by Congress, the Foundation establishes partnerships among federal agencies and corporate partners to catalyze investments for fish and wildlife conservation. For every federal dollar invested in the Foundation, more than three dollars is delivered to the ground for conservation.

Across the nation, Foundation grants are conserving working landscapes, improving public access, and fostering innovative strategies that maximize species and conservation outcomes. In addition, the Foundation has developed a focused strategic plan based on national, regional, and local conservation needs. Program performance is monitored and evaluated on an annual basis to ensure that grant dollars are allocated only to the most cost-effective and conservation-efficient

projects. These efforts benefit natural resources while positively impacting local economies through enhanced recreation, tourism, and other business activities. The Foundation has demonstrated its unique ability to leverage federal funds and bring together public and private entities to implement coordinated conservation strategies through grant-making programs.

NFWF has made a strong commitment to restoration and protection of waterfowl and migratory bird habitat through their work at the Foundation, and DU supports reauthorization.

S. 1249, To Amend The Pittman-Robertson Act:

Along with 26 other members of the America's Wildlife Conservation Partnership, Ducks Unlimited has joined in support of this legislation to amend the Pittman Robertson Act to provide incentives for states to develop shooting ranges on federal public lands. This legislation would also result in increased wildlife conservation funding.

Hunters, shooting sports participants, and firearms, archery, and ammunition manufacturers are the largest financial supporters of wildlife conservation throughout the United States having contributed more than $6 billion to habitat conservation, recreational shooting and wildlife management through Pittman-Robertson excise tax payments, including almost $4.8 billion just since 1991. Despite the unqualified success of this historic "user pays" system, Pittman-Robertson funds have not always been administered consistently in a manner that encourages the creation of recreational shooting opportunities. Unfortunately, these opportunities for both informal recreational and competitive shooting on public lands have declined significantly in recent years. The *Target Practice and Marksmanship Training Support Act* would help address this loss of access and opportunity by providing states with more flexibility in their use of Pittman-Robertson funds to develop shooting ranges on federal public lands.

Under the Pittman-Robertson Act, states must fund the cost of wildlife restoration and shooting range projects using revenue generated primarily from the sale of hunting licenses and game tags. The federal government's 75% reimbursement derives from the Pittman-Robertson excise taxes on firearms, ammunition and archery equipment. In order to facilitate the development and management of shooting ranges on federal public lands, the *Target Practice and Marksmanship Training Support Act* would increase the reimbursement to 90%. Pittman-Robertson funds are allocated to states on a formula basis. Therefore, while it would provide additional capability to states, the reimbursement rate would not result in increased federal spending.

In addition, this important legislation would amend an existing requirement that Pittman-Robertson funding used for shooting ranges be obligated within two years by allowing the funds to accrue over five years. This extension would allow individual projects to be funded over multiple budget cycles and significantly enhance the ability of states to build and maintain shooting ranges. In addition, the legislation would limit the unnecessary exposure to liability that federal land management agencies may face when providing recreational shooting opportunities on public lands.

Providing states with these new incentives will improve the safety of recreational shooting and assist in the recruitment and retention of hunters and shooters. It will also result in additional purchases of firearms, archery equipment, and ammunition, the excise taxes on which will provide increased funding for wildlife conservation and hunter education programs. Therefore, DU supports S. 1249.

S. 1266, To Create A Restoration Program Affecting The Delaware River Basin

Ducks Unlimited supports the efforts to create a framework for making substantial progress towards the protection and restoration of the ecologically and economically significant Delaware River Basin.

The Delaware River Basin is the largest drinking water supplier in the Mid-Atlantic. It supports a multi-billion dollar economy in the form of fisheries, recreation, and tourism, and provides valuable wildlife habitat. After experiencing two consecutive catastrophic flooding events, the Delaware River Basin requires attention now more than ever. Action outlined in this legislation will provide for the sustainable future of the Delaware River Basin and the tremendous benefits it provides.

This bill would require the U.S. Fish and Wildlife Service, in partnership with other federal agencies, to establish the Delaware River Basin Restoration Program to increase coordination and collaboration of conservation efforts currently underway in the entire Basin. Concurrently, the legislation would provide for the creation of a competitive grants program--along with much-needed technical assistance--to add to the limited federal resources available to the watershed. The involvement of the Army Corps of Engineers and the Environmental Protection Agency is important to the success of this inter-agency partnership to restore and protect the Delaware River Basin.

The Delaware River Basin is unique, economically and ecologically important. Ducks Unlimited supports this legislation.

Thank you.

TESTIMONY FOR THE RECORD OF JEFF TRANDAHL, EXECUTIVE DIRECTOR, NATIONAL FISH AND WILDLIFE FOUNDATION BEFORE THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS REGARDING THE NATIONAL FISH AND WILDLIFE FOUNDATION REAUTHORIZATION ACT (S. 1494)

April, 24 2012

The National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 to catalyze private investments to conserve fish, wildlife, and their habitats. Since inception, NFWF has been successful in bringing together federal agencies with private partners to build strategic partnerships to address the most significant threats to fish and wildlife populations and their habitats. We appreciate the Committee's continued support of NFWF and consideration of the National Fish and Wildlife Foundation Reauthorization Act (S. 1494).

The goal of NFWF is to ensure abundant wildlife species in order to allow the economic health of our nation to continue. The key elements of our approach include: (1) leverage, (2) efficiency, (3) partnerships, (4) transparency, and (5) measurable outcomes.

Using this approach, NFWF strives to support community-based, voluntary conservation actions that are cost-effective and positively impact working lands and local economies. NFWF is currently working with 14 federal agencies and more than 50 corporations, foundations, and other private organizations to coordinate and leverage funds for conservation through competitive grant programs.

To date, NFWF has leveraged $576 million in federal funds into $2 billion for conservation through more than 11,600 grants in the United States and abroad.

Across the nation, NFWF grants are restoring and protecting imperiled species, improving working landscapes for wildlife, promoting healthy oceans and estuaries, and conserving treasured places for future generations of Americans. NFWF grants are locally-driven and advance collaborative, non-regulatory conservation efforts that enhance and sustain recreation, tourism, and other business opportunities.

NFWF has fulfilled Congress' mandate to generate private investment for conservation and continuing this work is especially important as federal budgets more and more constrained. NFWF is a sound federal investment because of our efficient operations, proven track record and statutory requirement to leverage federal funding with private contributions to conserve and manage fish, wildlife, and their habitats.

The National Fish and Wildlife Foundation Reauthorization Act affirms the original purposes of NFWF and strengthens the ability of NFWF to raise private dollars, work with federal agencies more effectively, reduce bureaucratic burdens, and maximize conservation outcomes. Importantly, S. 1494 will ensure NFWF's ability to save money for the federal government through efficient grant administration, effective collaboration, and significant leverage through private sector contributions.

NFWF Background

The National Fish and Wildlife Foundation Establishment Act of 1984 (P.L. 98-244) created NFWF as an independent, 501 (c)(3) non-profit organization with perpetual succession. The purpose of NFWF is to promote private investments that benefit the activities of the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration and to further the conservation and management of the fish, wildlife, and plant resources of the United States for present and future generations of Americans.

NFWF was reauthorized in 1998, 1990, 1994, 2000, 2002, and 2006. The National Fish and Wildlife Foundation Reauthorization Act of 2006 (P.L. 109-363) renewed NFWF's direct appropriations authorization through FY 2010 of up to $25 million annually through the Department of the Interior (DOI) and $5 million annually through the Department of Commerce (DOC). Despite expired authority, funding for NFWF was included in the Department of Interior's budget requests and approved by Congress in FY 2011 and FY 2012. The Department of Interior's FY 2013 budget request is the same as the FY 2012 enacted levels.

In FY 2012, Congress approved $7.5 million for NFWF through U.S. Fish and Wildlife Service (FWS), $3 million through Bureau of Land Management (BLM), and $3 million through the U.S. Forest Service (FS) for a total of $13.5 million. These funding levels are consistent with previous years and have strong support in the House and Senate.

As intended by Congress, NFWF's direct appropriations serve as the "seed" funds for NFWF to attract private contributions for fish and wildlife conservation. NFWF is required by law to match each directly appropriated federal dollar with a minimum of one non-federal dollar. We consistently exceed this requirement by leveraging all federal funds at a 3:1 average ratio through private sector and grantee matching contributions. Further, NFWF is prohibited from spending directly appropriated funds on administrative or overhead expenses. Thus, every directly appropriated dollar provided to NFWF is awarded to grant recipients for on-the-ground conservation.

In addition to direct appropriations through DOI and DOC, NFWF is authorized to receive other funds from federal agencies to further the conservation and management of fish, wildlife, plants and other natural resources. NFWF receives other federal funds through cooperative agreements and often serves in a fiduciary role for federal agency partners. NFWF currently works with 11 federal agencies through cooperative agreements and awarded $31 million through cooperative agreements in FY 2011.

Partnering with NFWF benefits the mission of the agencies, foster collaboration, and facilitate positive conservation outcomes in several ways: (1) NFWF leverages federal funds with private sources, (2) NFWF offers expertise in grant administration, (3) NFWF has the ability to convene multiple federal agencies and non-federal partners to address specific conservation challenges, and (4) NFWF provides scientific leadership in achieving measurable and sustainable conservation outcomes.

In addition to the agencies that are specifically mentioned in the NFWF Establishment Act - U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration - NFWF works closely with numerous other federal agencies with responsibilities in natural resource conservation. NFWF's major federal partners include: Bonneville Power Administration, Bureau of Land Management, Bureau of Reclamation, Department of Defense, Environmental Protection Agency, Marine Mammal Commission, National Park Service, U.S. Forest Service, USDA's Animal Plant Health Inspection Service, and USDA's Natural Resources Conservation Service.

In working with multiple federal agencies, NFWF has developed a successful model of coordinating and leveraging federal funds to form public-private partnerships for fish and wildlife conservation. Since 1984, NFWF has received thousands of contributions from private individuals, corporations and foundations. Examples of NFWF's major private partners include: Altria, ArcelorMittal, Anheuser-Busch, Bass Pro Shops, Bed Bath & Beyond, BP, Chevron, ConocoPhillips, Covanta Energy, FedEx, Jackson Hole One Fly Foundation, Northrup Grumman, Orvis, PacifiCorp, Pacific Gas & Electric Company, Shell Oil Company, Southern California Edison, Southern Company, Syngenta, Gordon and Betty Moore Foundation, TradeWind Energy, Walmart, Walton Family Foundation, and William Penn Foundation.

NFWF Grantmaking

For nearly three decades, NFWF has been at the forefront of national conservation activity. With our partners, NFWF has contributed to some of the nation's most important conservation programs, invested millions in worthy and successful projects, and spearheaded programs to conserve our nation's most treasured natural resources. Since inception in 1984, NFWF's breadth of experience in conservation has expanded, our fundraising capabilities have grown, and the demand for our expertise has increased. All of these results have made it possible for NFWF to continue to drive groundbreaking conservation, create diverse partnerships, and leverage significant intellectual and financial resources.

In 2008, at the direction of NFWF's Board of Directors, NFWF adopted a new decision-making framework that has enabled us to better define, invest in, and deliver measurable improvements to targeted species. This framework includes a rigorous science and evaluation function to ensure that NFWF grants are focused on projects likely to maximize conservation impact while remaining fiscally responsible. This decision-making process has resulted in a better way of tracking progress and measuring the benefits of NFWF investments. For example, significant increases in populations of coho salmon, Apache trout, sea turtles and American oystercatcher have been documented at critical sites where NFWF has invested.

Meaningful and measurable outcomes, evaluation, and accountability are NFWF's building blocks to ensure maximum conservation impact. We work directly with federal and state agencies and our other partners to measure progress, promote adaptive management, demonstrate results, and continuously learn from project investments. NFWF's grant-making involves a thorough internal and external review process. Peer reviews involve federal and state agencies, affected industry, non-profit organizations, and academics. Grants are reviewed by the NFWF's science and evaluation team before being recommended to the Board of Directors for approval.

By law, Congressional offices are notified 30 days in advance of grants that will be awarded in their district or state that includes more than $10,000 in federal funds.

NFWF solicits grant proposals through detailed application processes and programs are highly competitive. NFWF grant recipients include state agencies, county and municipal governments, tribes, universities, and non-profit conservation organizations. NFWF provides critical support to local land trusts, conservation districts, watershed associations, sporting and recreational interests, and other organizations working at the local level to conserve and manage fish and wildlife resources.

In FY 2011, NFWF awarded $46 million in federal funds (via direct appropriations and cooperative agreements) and $16.5 million in non-federal funds through 569 grants. Grant recipients provided an additional $67.7 million in matching contributions for a total project investment of $130 million.

NFWF Partnership Examples

With our federal and private partners, NFWF is working to identify and fund critical conservation efforts across the United States that will achieve measurable outcomes for fish, wildlife, and other natural resources. For example:

Chesapeake Bay: NFWF has worked with our federal and state partners since 2000 to administer the Chesapeake Bay Stewardship Fund (Fund). Through the Fund, diverse agencies like the Environmental Protection Agency, the U.S. Forest Service, the National Oceanic and Atmospheric Administration and the USDA's Natural Resources Conservation Service are able to leverage resources with corporate sponsors like Altria, Walmart, and FedEx to increase the impact any one of them could have alone. The Fund plays a critical role in local implementation of the most innovative, sustainable and cost-effective strategies for restoring and protecting water quality and vital habitats within the Chesapeake Bay watershed. Grants, technical assistance, information sharing, and monitoring are all important components of the program that ensure project success and sustainable outcomes. To date, projects funded through the Fund collectively are projected to reduce water pollution by over 12.1 million pounds of nitrogen, 3.2 million pounds of phosphorous, and 371 million pounds of sediment, as well as increase populations of oysters, Eastern brook trout and important anadromous fish such as river herring and shad.

Short Grass Prairie Ecosystem: NFWF is accelerating our investments in the short grass prairie ecosystem of Oklahoma, Kansas, New Mexico, Texas and Colorado. A primary focus of this initiative is improving habitat for the lesser prairie-chicken to prevent listing of the species under the Endangered Species Act. In 2011, NFWF secured support for this expanding initiative with funding through USDA's Natural Resources Conservation Service and a private partner, TradeWind Energy. NFWF will be working with our federal partners, including FWS and BLM, to leverage and coordinate a diverse array of federal and private resources for projects across the region. Specifically, grants to local organizations will address the technical assistance needs of farmers, ranchers, and other private landowners for optimizing habitat for lesser prairie-chickens. We have already seen the success of this model in New Mexico where new private lands

biologists will be working with the New Mexico Association of Conservation Districts and private landowners in 2012 to restore critical habitat. We expect at least 100,000 acres of habitat in the state to be improved, thereby accelerating recovery of the lesser prairie-chicken and other imperiled grassland birds in the region.

Longleaf Pine Ecosystem: Building on nearly a decade of investment to protect and restore vanishing longleaf pine forests in the southeastern United States, NFWF established the Longleaf Stewardship Fund in 2011. This landmark public-private partnership will award approximately $3 million in FY 2012 with support through USDA's Natural Resources Conservation Service, U.S. Department of Defense, Forest Service, U.S. Fish and Wildlife Service, and Southern Company. With the combined financial and technical resources of the partnership, the expanded program will support accelerated restoration of the longleaf pine ecosystem and implementation of the Range-Wide Conservation Plan for Longleaf Pine. NFWF is working with partners to establish specific measurable conservation goals that can be tracked over time. These goals will support the recovery of important keystone species of the longleaf pine ecosystem including red cockaded woodpecker, gopher tortoise and Northern bobwhite quail and advance specific habitat restoration goals outlined in the Range-Wide Plan.

Gulf of Mexico: In the days following the 2010 Deepwater Horizon explosion in the Gulf of Mexico, NFWF took immediate action to help protect the species most at risk. We quickly convened discussions among our own experts and the best scientific minds in the country, creating a strategic response plan to protect imperiled wildlife — particularly sea turtles and migratory birds. NFWF's leadership during the crisis drew on an extensive history of conservation investments in the Gulf of Mexico. Working in all habitats and on all species throughout the region, we had already supported over 450 projects investing more than $128 million in the Gulf. Many of these projects were made possible through our long-standing partnerships with Shell Oil and Southern Company. When the spill occurred, NFWF's well-established relationships with federal and state agencies, scientists, and on-the-ground conservation organizations were invaluable in assessing local wildlife needs and shaping effective responses.

NFWF determined that affected species would have the best chance of surviving the spill if efforts to boost their populations outside the spill zone were significantly strengthened. In the first phase of its Gulf response, NFWF invested in 22 projects which are now delivering results in Louisiana, Mississippi, Alabama, Florida and Texas. This first phase of projects was financed using $8.8 million from the Recovered Oil Fund for Wildlife, established by BP with proceeds from the sale of oil recovered from the spill site, as well as a $2.25 million commitment from Walmart. Since then, NFWF has invested an additional $14.1 million from the Recovered Oil Fund for Wildlife and other sources — $22.9 million total — to bolster populations of species affected by the spill in advance of formal restoration efforts. These investments have helped to pilot cost-effective conservation approaches and build capacity in the region to sustain conservation outcomes. With our federal and private partners, more than 500,000 acres of coastal of freshwater wetland and aquatic habitat was enhanced to benefit a variety of migratory birds. Other investments have increased the number of sea turtle hatchlings by over 100,000 and are ensuring the survival of an additional 800-1,000 adult and juvenile sea turtles annually.

Path of the Pronghorn: In 2009, NFWF and our partners identified the Green River Basin of Wyoming (Basin) as a priority area for coordinated conservation efforts. The Basin supports significant populations of sage grouse, mule deer, pronghorn and elk. These species are threatened by habitat fragmentation, subdivision, fencing across key migration corridors, increased mortality along local roads and highways, and conflicts with expanding energy development on their wintering range. In partnership with FWS, BLM, USDA's Natural Resources Conservation Service, Walmart and the Turner Foundation, NFWF has focused its grants to address these threats including improvements to fencing so that pronghorn and other wildlife can migrate more easily, reducing the effects of roads on wildlife, and protecting key parcels where subdivision and development threaten the entire migration corridor. With NFWF support, 121 miles of barbed-wire fencing has been modified to enable movement through the corridor by pronghorn, 23,000 acres of habitat is now protected through voluntary conservation easements, and the State of Wyoming is constructing state-of-the-art highway crossings for wildlife. Success in this region is being used as a model to develop other wildlife corridor initiatives in the Northern Rockies.

Walmart & Acres for America: NFWF established a partnership with Walmart in 2005 to provide urgently needed funding for projects that conserve large, landscape-level areas that are important habitat for fish and wildlife, while also providing open space and recreational benefits for people. Acres for America is a 10-year, $35 million commitment to protect one acre (or more) of wildlife habitat in the U.S. for every acre of land developed by the company through 2015. To date, Acres for America has invested in projects in 24 states, protecting more than 687,000 acres of open space and essential habitat for wildlife and far exceeding the developed acreage of Walmart. Two examples of recent projects include: (1) Appalachian Trail Habitat Protection Project that will protect essential forest and stream habitat in North Carolina and Tennessee to benefit important populations of southern Appalachian brook trout, 1,000 species of plants, at least 300 species of birds and 20 species of rare and declining salamanders and (2) McArthur Lake Wildlife Corridor Project that will protect the narrowest and most critical link between the Selkirk and Cabinet-Yaak Mountain ecosystems in northern Idaho, providing a crucial connection for 1 million acres of public land. The project will also protect two grizzly bear recovery zones and habitat for more than two dozen species of high conservation need.

Fishing for Energy Program: In 2008, NFWF established an innovative partnership with NOAA's Marine Debris Program, Covanta Energy and Schnitzer Steel Industries. The Fishing for Energy Program offers no-cost solutions to fishermen to dispose of old, derelict, or unusable fishing gear and works to reduce the amount of fishing gear in and around coastal waterways across the United States. Marine debris threatens marine species and navigational safety. Derelict fishing gear that remains in the water is known to continue to catch commercially-valuable species and catches non-targeted species, including species that may be listed as endangered or threatened. The partnership works closely with state and local agencies, community and fishing groups, and local ports to install bins at convenient and strategic locations into which fishermen can deposit fishing gear. The gear is collected and transported to a nearby Schnitzer Steel facility where the metal is recycled and rope or nets are sheared for easier handling for disposal. Then the gear is brought to the nearest Covanta Energy-from-Waste facility where it is converted into renewable electricity for local communities. One ton of commercial fishing gear can generate enough electricity to power an average family home for 25

days. To date, the Fishing for Energy program has collected 680 tons of gear through partnerships with 29 ports in the states of California, Florida, Maine, New Hampshire, New Jersey, New York, Oregon, Rhode Island, and Virginia.

NFWF Impact-Directed Environmental Accounts Program: A key component of NFWF's conservation investment is the Impact-Directed Environmental Accounts (IDEA) program. The IDEA program receives, manages, and disburses funds that originate from court orders, settlements of legal cases, regulatory permits, licenses, and restoration and mitigation plans. Through the IDEA program, NFWF acts as a neutral third-party fiduciary to manage funds for the benefit of government and private-sector stakeholders while maximizing conservation outcomes. IDEA works collaboratively with these partners to ensure that the funds are applied to the most effective conservation and restoration projects. Depending on the specific context, IDEA provides a variety of services including financial account management, assistance with project solicitation and selection, negotiation and administration of contracts and grant agreements, identification of potential leveraging opportunities, investment of funds pending disbursement, and evaluation of project outcomes.

NFWF is uniquely positioned to administer impact-directed funds in a way that maximizes conservation impact within specific legal, regulatory, and contractual constraints. Currently, the IDEA program manages over 100 accounts across the nation, working with federal and state agencies and other partners to advance fish and wildlife conservation in more than 20 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

NFWF Reauthorization Act (S. 1494)

Since enactment of the National Fish and Wildlife Foundation Establishment Act of 1984 (P.L. 98-244), NFWF has been reauthorized six times and was most recently reauthorized in 2006 (P.L. 109-363). In 2008, legislation was enacted to increase the size of NFWF's Board of Directors from 25 to 30 (P.L. 110-281).

The National Fish and Wildlife Foundation Reauthorization Act (S. 1494) was introduced by Chairwoman Boxer on August 2, 2011 with strong bipartisan support. As of March 12, 2012, there are 12 co-sponsors of S. 1494: Baucus (D-MT), Bingaman (D-NM), Cardin (D-MD), Cochran (R-MS), Collins (R-ME), Murkowski (R-AK), Roberts (R-KS), Snowe (R-ME), Tester (D-MT), Thune (R-SD), Udall (D-NM), and Whitehouse (D-RI).

S. 1494 renews NFWF's direct appropriations authorization level of $30 million for an additional five years. The $30 million authorization is amended to include: $20 million annually through the Department of the Interior; $5 million annually through the U.S. Department of Agriculture (USDA); and $5 million annually through the Department of Commerce. It is important to note that NFWF currently receives $3 million annually through USDA's Forest Service and historically received direct appropriations through USDA's Natural Resources Conservation Service.

S. 1494 includes additional amendments to the Establishment Act that are intended to:

- strengthen NFWF's ability to work with federal agencies more effectively, reduce bureaucratic burdens, and maximize conservation outcomes;
- clarify NFWF's ability to receive and administer restitution, community service payments and similar funds for conservation;
- improve efficiency by providing discretion to the federal agencies to provide funds to NFWF in advance; and
- clarify agencies' ability to receive funds from NFWF for conservation.

S. 1494 maintains the following provisions in the Establishment Act:

- purpose of NFWF to encourage private investments in conservation;
- 1:1 matching requirement for direct appropriations;
- prohibition on use of direct appropriations for administrative expenses;
- prohibition on grant funds for litigation, advocacy, or lobbying;
- appointment of a 30-Member Board of Directors by the Secretary of the Interior that includes the Director of the U.S. Fish and Wildlife Service and the NOAA Administrator;
- requirement to provide Congress with 30-day notice of grants that include $10,000 or more of federal funds;
- requirement to report annually to Congress on NFWF activities.

Conclusion

NFWF effectively brings together the federal government and private sector to maximize leverage, implement innovative natural resource strategies, and achieve measurable outcomes. NFWF's approach has fostered significant accomplishments in conservation and plays an important role in ensuring the protection of fish and wildlife species and their habitats for future generations. The reauthorization of NFWF will help to strengthen and continue the success of this efficient and important model for voluntary conservation that benefits fish, wildlife, and people. We appreciate your continued leadership on behalf of NFWF and look forward to working with you as the legislation moves forward.

NATIONAL ENVIRONMENTAL COALITION ON INVASIVE SPECIES

Alliance for the Great Lakes, Great Lakes United, National Audubon Society
The Nature Conservancy, The Wildlife Society

April 20, 2012

Senator Benjamin Cardin, Chairman
Environment and Public Works Committee
Subcommittee on Water and Wildlife
509 Hart Senate Office Building
Washington DC 20510

Senator Jeff Sessions, Ranking Member
Environment and Public Works Committee
Subcommittee on Water and Wildlife
326 Russell Senate Office Building
Washington DC 20510

Re: Wildlife Disease Emergency Act, S.357 – Hearing on April 24

Dear Chairman Cardin and Ranking Member Sessions,

The National Environmental Coalition on Invasive Species (NECIS) is a national partnership of several major environmental and scientific organizations that provides a united voice on invasive species policy. It includes scientists, lawyers, activists and advocates with many years of experience on invasive species issues. The undersigned NECIS members are writing to express our support for the Wildlife Disease Emergency Act, S.357, while we respectfully ask that it be modified as we suggest below. We applaud Senator Lautenberg's leadership in addressing this issue and we appreciate that it has been scheduled for a hearing in the Environment and Public Works Committee on April 24.

Emerging wildlife pathogens and parasites are a subset of the invasive species problem. They pose a critical threat to the health of wildlife, and in some cases the same pathogens and parasites can also harm humans and/or domesticated animals. The global trade in wildlife and pets, international travel, introduction of non-native species and changes in land use have all contributed to wildlife coming into contact with pathogens and parasites to which they are unaccustomed and lack resistance. Prevention is the key to stopping disease outbreaks and the often dire health and economic impacts on the nation, such as we are seeing now with the deadly white nose syndrome in bats and the chytrid fungus that has eradicated many native amphibian species.

The Wildlife Disease Emergency Act as written would help remedy some of the major challenges in responding to emerging diseases. However, to paraphrase the old saying, "an ounce of prevention is worth a pound of response". The bill should be strengthened on the prevention side. Therefore, we urge these two brief, but critical, changes:

- Sec. 2 PURPOSES, should have a one word addition, (in bold here):

  The purposes of this Act are—
  (1) to authorize the Secretary of the Interior to identify, ***prevent*** *and declare wildlife disease emergencies;*

- Under Sec. 8 – Administration, add a new subsection:

  a) The Secretary may issue regulations and orders necessary to prevent wildlife disease emergencies.

Four additional changes related to Sec. 3 DEFINITIONS, will give the bill the full scope needed to effectively address wildlife disease risks:

- The definition "(2) DISEASE" should delete the exclusionary phrase "~~is not a zoonotic~~". A vast number of wildlife diseases are zoonotics. Excluding all zoonotics from the bill would not be prudent because, when it comes to their wildlife impacts, the fact that a zoonotic disease also may infect humans does not mean the disease is adequately addressed under other Federal laws or by other agencies. Keeping that exclusionary phrase in the bill will drastically reduce the ability of the Secretary of the Interior to prevent and respond to the wildlife-specific impacts of future zoonoses comparable to the devastating West Nile virus or monkeypox virus, which are examples of zoonotics introduced into the United States since 2000. We recommend these additional changes to the bill so that, while it would include zoonotic diseases, it also would ensure that the Interior Department does not duplicate or interfere with the authority of USDA to regulate livestock or plant diseases or the authority of CDC to regulate human diseases:

  [[insert the **bolded text** in Sec. 8 ADMINISTRATION, so the whole Section would read as below, including the new section (a) on adopting needed preventative measures that we recommended adding, above:]]

  a) The Secretary may issue regulations and orders necessary to prevent wildlife disease emergencies.

  (b) *Nothing in this Act--*

  (1) limits the authority of the Secretary to respond to wildlife disease events that are not declared wildlife disease emergencies under this Act;
  (2) limits, repeals, supersedes, or modifies any provision of Federal, State, local, or tribal law (including regulations); or
  (3) authorizes the Secretary to regulate any pathogen or parasite that is—

(A) defined or regulated by the Department of Health and Human Services as a threat to humans under section 361 of the Public Health Service Act (42 U.S.C. 264);

(B) defined or regulated by the Department of Agriculture as a threat to livestock or poultry under the Animal Health Protection Act (7 U.S.C. 8301 et seq.); or

(C) defined or regulated by the Department of Agriculture as a plant pest or approved for biological control purposes under the Plant Protection Act (7 U.S.C. 7701 et seq.).

(4) Exception.—The Secretary may regulate a pathogen or parasite described in any of subparagraphs (A) through (C) of paragraph (3) to the extent that the pathogen or parasite poses a wildlife disease risk.

- The definition "(8) WILDLIFE" is too restrictive. We question the need to include this definition in the bill, but if it is to be defined it should simply say "**any wild animal**" and not be restricted as it is now to "native" animals. The Secretary needs to be able to address disease in non-native species of wildlife in the country because deadly infectious diseases that may at first infect non-native wildlife then may later infect native wildlife.

- Further, there is no need for the definition to include the list "*mammals, fish, birds, amphibians, reptiles, mollusks, and arthropods.*" This excludes coverage of diseases in some wild native invertebrate groups, such as, for example, echinoderms or annelids. It is preferable to just say "**any wild animal**".

- Finally, we recommend that the definition "(9) WILDLIFE DISEASE EMERGENCY" should be added to as indicated in bold so as to include "parasites". Many wildlife diseases, such as heartwater, are caused by parasites, so their role should not be ignored.

The term 'wildlife disease emergency' means a disease that--
(A) is infectious and caused by--
(i) a newly discovered pathogen ***or parasite***

Thank you for your attention to these recommendations. If you have any questions, please contact our policy lead on this issue, Peter T. Jenkins, Center for Invasive Species Prevention at pjenkins@gmail.com or tel: 301.500.4383.

Sincerely,

Laura Bies
Director of Government Affairs
The Wildlife Society

Michael Daulton
Senior Director of Government Relations
National Audubon Society

Jennifer Nalbone
Director, Navigation and Invasive Species
Great Lakes United

Kristine Serbesoff-King
Invasive Species Program Manager
The Nature Conservancy – Florida

Jared Teutsch
Water Policy Advocate
Alliance for the Great Lakes

cc: members of the Water and Wildlife Subcommittee

Hearing on S.810
The Great Ape Protection and Cost Savings Act
A bill to phase out the use of chimpanzees in invasive research, retire them to appropriate sanctuaries and end the breeding of chimpanzees for invasive research purposes.

U.S. Senate
Committee on Environment and Public Works
Subcommittee on Water and Wildlife

Testimony of
The Humane Society of the United States
April 24, 2012

The Humane Society of the United States would like to thank Chairman Cardin, Ranking Member Sessions and members of the Water and Wildlife Subcommittee for the opportunity to submit testimony in support of the Great Ape Protection and Cost Savings Act, S. 810, a bill which would phase out the use of chimpanzees in invasive research over three years, end breeding of chimpanzees for invasive research purposes and retire government-owned chimpanzees to appropriate sanctuaries. We would also like to take this opportunity to thank Senators Cantwell, Collins and Sanders for their leadership on this bill.

On behalf of The Humane Society of the United States, the nation's largest animal protection organization, and our more than 11 million supporters nationwide, we strongly support this legislation, which would not only protect chimpanzees but would save taxpayers an estimated $300 million over the next 10 years. We urge the Subcommittee to support this bill.

Summary

Approximately 950 chimpanzees—some who were captured from the wild more than 40 years ago, used by the entertainment industry or kept as pets—currently live in six biomedical research and testing laboratories in the United States. Despite extensive knowledge of their rich social and emotional lives and their ineffectiveness as models for human diseases, some chimpanzees continue to be subjected to invasive experiments. However, at any given time, 80-90% of chimpanzees are not being used in active research protocols and have, instead, languished in laboratories for decades, wasting millions of taxpayer dollars.

An Institute of Medicine committee recently concluded that nearly all biomedical research using chimpanzees is unnecessary. Further, the IOM committee could not identify a single area of research for which the use of chimpanzees is critical.

The Great Ape Protection and Cost Savings Act is needed to ensure that taxpayer money is no longer wasted on costly and ineffective research approaches—and to, instead, provide the opportunity to invest in alternatives that will translate into human health benefits. Importantly,

this legislation will also provide government-owned chimpanzees with the sanctuary they deserve after spending their lives in laboratories—which is also significantly less expensive than maintaining them in laboratories While this legislation is a phase out of invasive research, it still allows for noninvasive research to be carried out on chimpanzees and other great apes.

Scientific Debate Put to Rest: Scientists Lend Their Support

In 2010, the National Institutes of Health (NIH) announced plans to transfer the approximately 200 chimpanzees at the Alamogordo Primate Facility in New Mexico—who had not been used in research for almost a decade—to the Southwest National Primate Research Center in Texas (also known as the Texas Biomedical Research Institute) where they would once again be available for invasive research. Following the initial transfer of 15 chimpanzees, there was a massive public outcry in response to these plans. In response, Senators Udall, Bingaman and Harkin urged NIH to halt the transfer and commission a study by the National Academy of Sciences. The NIH commissioned the study and the Institute of Medicine (IOM) examined the necessity of chimpanzees in biomedical and behavioral research.

In December 2011, the IOM released its final report entitled: *Chimpanzees in Biomedical and Behavioral Research: Assessing the Necessity*. The IOM committee looked at several areas of NIH-supported research involving chimpanzees and concluded that chimpanzees are "largely unnecessary" for most current research and, further, laid out criteria for how NIH should decide if current and future studies using chimpanzees should be pursued. Importantly, the committee could not identify any area of current biomedical research for which chimpanzees are essential and pointed to several available alternatives to the use of chimpanzees. Finally, the report recommended that NIH invest more resources into the further development of alternatives to chimpanzee use.[1]

It's also important to note that the U.S. Food and Drug Administration does not require the use of chimpanzees to test new drugs vaccines or biologics, and further, the Center for Drug Evaluation and Research (under FDA) actually discourages the use of chimpanzees.[1] Additionally, there are pharmaceutical companies, such as GlaxoSmithKline[2], Abbott Laboratories[3] and Idenix Pharmaceuticals[4], that have publicly adopted policies that have completely ended or strictly limited the use of chimpanzees in invasive research. Major scientific journals have pointed out the serious ethical issues surrounding chimpanzee research

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[1] Institute of Medicine and National Research Council of the National Academies. (2011). *Chimpanzees in Biomedical and Behavioral Research: Assessing the Necessity.* Washington, DC: National Academies Press.
[2] GlaxoSmithKline. (2011). *Use of Non-human Primates (NHPs) in the Discovery and Development of Medicines and Vaccines.* http://www.gsk.com/policies/GSK-public-position-on-NHP.pdf (Accessed March 9, 2012).
[3] Abbott Laboratories. (2012). *Policy on the Use of Chimpanzees in Biomedical Research.* http://abbott.com/citizenship/priorities/innovate/animal-welfare.htm#cbr. (Accessed March 9, 2012)
[4] Idenix Pharmaceuticals. (2012). *Use of Non-Human Primates (NHPs) in the Discovery and Development of Medicines.* http://www.idenix.com/hcv/Use%20of%20Chimp%20Policy.pdf. (Accessed March 9, 2012)

and Scientific American published an editorial urging an end to invasive chimpanzee research.[5] Finally, more than 800 scientists with higher-level degrees have signed in support of ending chimpanzee use.

Significant Taxpayer Savings

The majority of the taxpayer savings that would result from passage of this bill, for a total of $300 million over the next ten years, are related to ending the use of chimpanzees in harmful experiments that have been deemed unnecessary by the Institute of Medicine. However, there is also a cost savings related to sending the nearly 500 federally-owned chimpanzees to sanctuary and ending the subsidy of privately owned chimpanzees currently in laboratories. Their large size, long lives and complex psychological needs make chimpanzees the most expensive animal used in research. Each federally owned chimpanzee born into the laboratory costs the government over $1 million to maintain over his or her lifetime. Thankfully, there is a more cost effective solution for the hundreds of chimpanzees currently being warehoused in laboratories: retire them to sanctuary.

Sanctuaries are able to provide chimpanzees with superior care at a fraction of the cost of laboratories. The amount of money the government spends to simply maintain one chimpanzee in a laboratory is as much as $24,000 per year while sanctuaries of a comparable population size provide care for approximately $15,500 per year. Additionally, the government currently pays the federal sanctuary system $16,700 per chimpanzee per year. Increasing the population size at the federal sanctuary will result in additional cost savings.

Finally, this bill would ensure additional cost savings in the future by preventing the breeding of chimpanzees for the purposes of invasive research. In a 2007 report of the NIH Chimpanzee Management Plan Working Group, it was estimated that maintaining a population of about 1,000 chimpanzees in laboratories would require 59 births per year and costs to sustain them would be $9.5 million per year.[6] While NIH currently has a moratorium on the breeding of federally-owned and federally-supported chimpanzees in place[7], it is important to ensure it remains in place. It is simply unwise to use limited research dollars on maintaining a population of chimpanzees which has proven to be unnecessary and ethically problematic. This bill would help to ensure the proper use of these important research funds.

Ethics and Public Opinion

What we have learned about the mental and emotional capabilities of chimpanzees since Dr. Jane Goodall first began observing wild chimpanzees 50 years ago is remarkable. Research has

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[5] The Editors. (2011), Ban Chimp Testing. *Scientific American*: http://www.scientificamerican.com/article.cfm?id=ban-chimp-testing (Accessed on March 21, 2012)

[6] National Institutes of Health. (2007). *Report of the Chimpanzee Management Plan Working Group*. http://www.ncrr.nih.gov/comparative_medicine/chimpanzee_management_program/ChimP05-22-2007.asp (Accessed March 9, 2012).

[7] National Institutes of Health. (2012). *Chimpanzee Management Program*. http://www.ncrr.nih.gov/comparative_medicine/chimpanzee_management_program/. (Accessed March 9, 2012).

shown that chimpanzees have complex social and emotional lives; they express a range of emotions, including pleasure, sympathy, fear, depression. Their incredible intelligence is evidenced by problem solving, tool use, numerical skills, and even the ability to communicate in American Sign Language.

There is overwhelming evidence that life in a laboratory has a significant physical and psychological impact on chimpanzees. In 2008, an unprecedented undercover investigation by The Humane Society of the United States (HSUS) at the world's largest chimpanzee laboratory, the New Iberia Research Center (NIRC), revealed what life is like for chimpanzees in laboratories.[8] The investigator documented chimpanzees isolated in small, steel cages for months at a time; chimpanzees screaming when chased with dart guns; and baby chimpanzees taken away from their mothers. The HSUS also documented the lives of individual chimpanzees like Sterling—a chimpanzee with severe psychological problems who self-mutilated—and Karen, who was 53 years old at the time of the investigation. Thankfully, Karen has now been retired to Chimp Haven--the federally-supported sanctuary system in Louisiana. Sadly, Sterling never reached sanctuary. He died in the laboratory in 2010.

Following the release of our investigation results, the United States Department of Agriculture (USDA) opened an investigation and subsequently cited NIRC for several Animal Welfare Act violations. NIRC eventually paid a stipulation of $18,000 to resolve the matter with USDA.

To add to the troubling findings of our investigation, two recent peer-reviewed publications show the long-term effects of laboratory life on chimpanzees. Both papers profile chimpanzees who were formerly used in research and are now suffering from symptoms similar to post-traumatic stress disorder (PTSD).[9,10]

Public opinion is clearly on the side of chimpanzees and public support continues to increase. For example, 71% believe that chimpanzees in the laboratory for over 10 years should be sent to sanctuary for retirement,[11] which represents the vast majority of chimpanzees in laboratories today. According to a 2001 Zogby poll, 54% of Americans believe it is unacceptable for chimpanzees to "undergo research which causes them to suffer for human benefit."[12] Similarly 52% of U.S. adults in 2001[13] were opposed to research that causes pain and injury to

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[8] The Humane Society of the United States. (2009). Undercover Investigation Reveals Cruelty to Chimps at Research Lab. http://www.humanesociety.org/news/news/2009/03/undercover_investigation_chimpanzee_abuse.html. (Accessed March 9, 2012).

[9] Bradshaw, G.A., Capaldo, T., Lindner, L. Grow, G. (2008). Building an Inner Building an Inner Sanctuary: Complex PTSD in Chimpanzees.Journal of Trauma & Dissociation, 9(1), 9-34.

[10] Ferdowsian H.R., Durham D.L., Kimwele C., Kranendonk G., Otali E., et al. (2011) Signs of Mood and Anxiety Disorders in Chimpanzees. PLoS ONE 6(6): e19855. doi:10.1371/journal.pone.0019855

[11] 2006 poll conducted by the Humane Research Council

[12] 2001 poll conducted by Zogby International for the Chimpanzee Collaboratory

[13] 2001 poll conducted by the National Science Board

chimpanzee or dogs, even if it produces new information about human health--this is up from 30% in 1985.[14]

Endangered Species Act considerations

The plight of the chimpanzee as a species and the impact of using chimpanzees for research purposes on the species are important factors to take into account when considering this legislation. Wild chimpanzees, for example, have declined in number by two-thirds in the last 30 years, and the prospects are becoming even more dire for them.

Currently, captive chimpanzees in the U.S. are deprived of protection under the Endangered Species Act even though their wild counterparts are fully protected. The lack of protection for captive chimpanzees not only doesn't help conservation efforts, as required by the ESA, but actually fuels poaching and trafficking of wild chimpanzees, therefore undermining conservation efforts.

In order to address this problem, a legal petition was filed by The HSUS and several other co-petitioners, including the Jane Goodall Institute, Association of Zoos and Aquariums and Wildlife Conservation Society, which urged the agency to list all chimpanzees as endangered under the ESA. The petition provides compelling scientific and legal evidence that the current regulation facilitates exploitation of chimpanzees and has a significant negative impact on both wild and captive chimpanzees.

For example, Dr. Richard Wrangham, a well-known primatologist, offers the following in an expert declaration submitted as part of the legal petition: "Commercial exploitation of chimpanzees in the U.S. not only directly threatens wild populations, but it also threatens the species indirectly by damaging the relationships and credibility essential for successful conservation efforts. In my experience, people in Africa are shocked to discover that in America it is legal to buy and sell chimpanzees, while it is illegal in African range countries. This perceived inequity creates a substantial obstacle for western conservationists such as myself when we approach countries where the species survives in the wild, teetering in many cases on the edge of extinction, and ask communities and government officials to do even more to protect chimpanzees....The problem of moral consistency is a very real one."

In September of 2011, USFWS published its initial finding in response to the petition, noting that the petition provides substantial information indicating that listing all chimpanzees as endangered may be warranted. The agency initiated a formal review of the status of the chimpanzee under the ESA, which is currently underway.

Concerns About National Institutes of Health Oversight of Chimpanzee Colony

As the subcommittee may be aware, NIH announced that it has accepted the IOM report findings and has created a working group to advise them on how to implement those findings.

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[14] 1985 poll conducted by the National Science Board

We would like to express our concern about continuing to allow NIH to make decisions for these chimpanzees. There is a long history of mismanagement of chimpanzees with strong evidence that NIH has had close relationships with the laboratories and, further has not had the best interests of these chimpanzees, or the taxpayers, at heart. We have enclosed a letter that we have submitted to the Health and Human Services Office of Inspector General which provides additional details about the concerns cited below.

NIH's mismanagement of chimpanzees dates back to the debacle of The Coulston Foundation (TCF), a facility notorious for violations of the Animal Welfare Act, Public Health Service Policy and FDA regulations. While NIH funding to TCF was eventually cut off in 2001, NIH provided the facility large amounts of funding over several years despite clear indications that there were major issues at the lab--including deaths of chimpanzees and primates as a result of Animal Welfare Act violations. NIH actually took title to 288 of the Coulston chimpanzees and awarded an expensive 10 year, $42.8 million contract to Charles River Laboratories to manage the population at Alamogordo Primate Facility, which continues today.

Despite their tragic history and the fact that many of the chimpanzees at Alamogordo are elderly and infected with diseases--making them poor potential research subjects--NIH has never indicated a willingness to send these chimpanzees to sanctuary, even though it would clearly save money. Instead, NIH attempted to transfer the chimpanzees to the Southwest National Primate Research Center through a grant that would actually cost more money than the current Charles River contract. In addition, the NIH grant awarded to Southwest for the care of federally-owned chimpanzees includes funds for a public awareness program to promote the use of chimpanzees in research, despite IOM report findings that chimpanzees aren't necessary for research.

Disappointingly, the situation with the Alamogordo chimpanzees is not the only one in which NIH has appears to be circumventing the intent of the Chimpanzee Health Improvement Maintenance and Protection Act (P.L. 106-551)--which called for the retirement of "surplus" chimpanzees determined as no longer needed for research. Shortly after the bill's passage, NIH awarded a $2 million construction grant to New Iberia Research Center to construct "holding facilities" for 80-100 chimpanzees so that NIRC could avoid sending chimpanzees to sanctuary.[15] Additionally, in the 2011 Request for Proposal for renewal of the chimpanzee sanctuary system contract, NIH indicated that there would be no further construction grants awarded to the sanctuary and no expansion of the system beyond 130 chimpanzees (there are approximately 120 federally-owned chimpanzees at the sanctuary now).[16]

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[15] NIH RePORTER database. (2002). Expansion of Chimpanzee Holding Fac. Grant to New Iberia Research Center. http://projectreporter.nih.gov/project_info_description.cfm?aid=6415562&icde=11721333&ddparam=&ddvalue=&ddsub=&cr=13&csb=default&cs=ASC (Accessed March 9, 2012).

[16] Federal Buisness Opportunities. (2011). *Operation and Maintenance of a Chimpanzee Sanctuary System of Retired Chimpanzees. Solicitation Number: NHLBI-CSB-RR-2012-4-KEC.* https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=f98737d68d7670518fe7d8cc36890cf2&_cview=0. (Accessed on March 9, 2012).

The HSUS has learned that NIH also fails to keep track of the chimpanzees owned by the government--except at Alamogordo Primate Facility and Chimp Haven. Responses to repeated Freedom of Information Act Requests by the HSUS show that NIH does not keep records of all of the chimpanzees the government owns, despite federal requirements to do so. (Please see attached FOIA response from NIH FOIA office).

Finally, NIH has obviously failed to ensure compliance with the breeding moratorium on federally-owned chimpanzees which has been in place since 1995. Following our investigation at New Iberia Research Center, The HSUS found evidence that government-supported breeding continues there. In 2011, our organization filed legal petitions with the Departments of Justice and Health and Human Services asking them to investigate the breeding of federally-owned chimpanzees at NIRC which has produced over 120 infant chimpanzees. It was later revealed in an article in *Nature* that NIRC admitted they are breeding federally-owned chimpanzees, which has resulted in the birth of 123 chimpanzees.[17] *Nature* also published an editorial in the same issue condemning NIH for not being open about the breeding and suggested that NIH actions were damaging their credibility with a public that is increasingly concerned with the treatment of animals in laboratories.[18]

Sanctuary Capacity in the U.S.

In the 1980's and 90's, NIH initiated a massive chimpanzee breeding program to produce a chimpanzee model of HIV/AIDS. However, it was eventually determined that chimpanzees are not a good model for the disease. This left laboratories with a "surplus" of chimpanzees and an increased need for high-quality, chimpanzee sanctuaries in the United States. In 2000, the passage of the Chimpanzee Health Improvement, Maintenance and Protection (CHIMP) Act established the national sanctuary system. In 2002, Chimp Haven in Louisiana was awarded the contract to run the national system and began taking in federally owned chimpanzees from laboratories. Chimp Haven currently provides sanctuary for approximately 120 federally-owned chimpanzees and, in response to the IOM report results, has stated a willingness to develop plans to expand their capacity to as many as 900 chimpanzees.[19]

Around the same time period, New Mexico's infamous Coulston Foundation--which had close to 600 chimpanzees--lost significant government and private funding after years of troubling issues and eventually went bankrupt. NIH took ownership of half the chimpanzees and awarded a contract to Charles River Laboratories to maintain the chimpanzees at the Alamogordo Primate Facility on Holloman Air Force Base in New Mexico. The other half of the chimpanzees were rescued by Save the Chimps, a sanctuary organization based in Florida, which continues to provide excellent care to its nearly 300 chimpanzees residents—all of who have been moved to

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[17] Wadman, Meredith. (2011). *Lab bred chimps despite ban.* Nature, Vol.479, Pages: 453–454. DOI: doi:10.1038/479453a. http://www.nature.com/news/lab-bred-chimps-despite-ban-1.9408#auth-1

[18] Editors. (2011), *Breeding Contempt.* Nature, Vol. 479, Page: 445, DOI:doi:10.1038/479445a http://www.nature.com/nature/journal/v479/n7374/full/479445a.html

[19] Chimp Haven. (2011). Report Assessing Use of Chimpanzees Released. http://www.chimphaven.org/government-report-assessing-the-use-of-chimpanzees-in-research-released/ (Accessed March 9, 2012).

Florida. Save the Chimps took on a financial responsibility that should have been addressed by the government and today is run entirely on private donations.

In 2010, sensing a growing need for collaboration, increased sanctuary capacity and professionalization of the movement, several chimpanzee sanctuaries--including Chimp Haven and Save the Chimps--came together to form the North American Primate Sanctuary Alliance (NAPSA). NAPSA's mission is to "advance the welfare of captive primates through exceptional sanctuary care, collaboration, and outreach." NAPSA has stated that it supports legislative and advocacy efforts that seek to end chimpanzee research and retire chimpanzees. The sanctuaries' missions are to provide for the lifetime care and welfare of captive animals by providing professional care and housing. Each NAPSA member facility in the US is licensed and inspected by the U.S. Department of Agriculture.

Bill amendment consideration: emergency clause

It is important to note that The HSUS will continue to support this bill if it is amended to allow for the use of chimpanzees in the unlikely case of a new, life-threatening clinical condition in humans for which there are no alternatives (including other species) to the chimpanzee available and for which there is scientific evidence that the use of the chimpanzee is warranted. Our support, however, would depend on a transparent process should such an emergency use be pursued.

Conclusion

The Great Ape Protection and Cost Savings Act (S.810) is common sense legislation that is needed to ensure the protection of chimpanzees and the judicious use of taxpayer dollars. The science, economics and ethics all point toward the need to end harmful research on chimpanzees and to retire these long-lived animals to appropriate sanctuaries. We strongly urge the Subcommittee to report the bill favorably and urge the Senate to pass this important measure.

Thank you again for the opportunity to provide testimony in support of the Great Ape Protection and Cost Savings Act. Please feel free to contact The HSUS for further information.

April 23, 2012

The Honorable Barbara Boxer
Chairwoman
Senate Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510-6175

The Honorable James M. Inhofe
Ranking Member
Senate Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510-6175

Dear Chairwoman Boxer and Ranking Member Inhofe,

On behalf of the ASPCA (the American Society for the Prevention of Cruelty to Animals) and our over 2.5 million supporters nationwide, I am writing in support of S. 810, the Great Apes Protection and Cost Savings Act of 2011. This commonsense, bipartisan legislation will not only prevent the cruel treatment of chimpanzees in research laboratories, but it will also save taxpayers up to $30 million per year.

About 1,000 chimpanzees, many captured from the wild, currently live in nine biomedical research and testing labs in the United States. Despite evidence of their expansive social and emotional development, chimpanzees continue to be subjected to painful and invasive experiments. When these animals are not being used for testing, they languish in laboratories under terrible conditions. The Great Ape Protection and Cost Savings Act would prevent this cruel and inhumane existence by phasing out invasive research on chimpanzees and other primates and retire federally-owned chimpanzees to sanctuaries.

Not only is testing on chimpanzees cruel, but it is also a waste of money. Retiring the 500 chimpanzees currently owned by the federal government to sanctuaries where their care is far more inexpensive will also create savings for taxpayers. American taxpayers spend nearly $30 million each year on chimpanzee maintenance and research, but approximately 90 percent of chimpanzees are not even used in active experiments. Instead, they are wasting away in federally funded facilities—some for more than 50 years.

The National Institutes of Health (NIH) has already moved to permanently end the breeding of federally-owned chimpanzees. This legislation takes the next step in ending this cruel practice by saving the lives of chimpanzees already in laboratories. We encourage the Committee to make the humane and fiscally responsible decision and support S. 810.

Thank you for your leadership on this important issue.

Sincerely,

Ed Sayres
President & CEO

[Additional statements submitted for the record follow:]

STATEMENT OF HON. SHELDON WHITEHOUSE,
U.S. SENATOR FROM THE STATE OF RHODE ISLAND

I want to thank Senator Cardin for scheduling this hearing to discuss legislation relevant to this Committee, particularly the National Fish and Wildlife Foundation Reauthorization Act of 2011 (S. 1494), which I am happy to be a co-sponsor of.

The National Fish and Wildlife Foundation (NFWF) enjoys bipartisan support for its ability to use Federal funding to leverage non-Federal support for conservation purposes—often at well over a 2 to 1 ratio—by creating successful partnerships with the Federal Government, State and local governments, and private entities.

At a time when Federal funding is difficult to come by and our coastal ecosystems are under stress from chemical and nutrient pollution, marine debris, energy extraction, overfishing, overdevelopment, and climate change, programs like NFWF are especially important.

NFWF has awarded 46 grants in Rhode Island since 2000. This $4.8 million in Federal funding has leveraged $6.6 million in matching funds, totaling $11.4 million invested in conservation.

For example, NFWF has provided funding to implement a marine science program for elementary schools in Newport, Rhode Island, to conduct biological surveys and management plans for acquisition of land trusts in Narragansett Bay. These management plans are being developed with private landowners in order to both protect natural resources and maintain a working landscape.

NFWF grantees in Rhode Island include the Rhode Island Party and Charter Boat Association, Rhode Island Natural History Survey, and Save the Bay. Among other things, these projects are focused on fisheries conservation, collection of marine debris, and improving essential marine and coastal habitats for a variety of native wildlife species.

I'd also like to speak in favor of another piece of legislation being discussed today, the North American Wetlands Conservation Extension Act (S. 2282). By restoring wetlands we also protect a variety of species, including migratory birds, that depend on these at risk ecosystems. More than half (roughly 55 million acres) of wetlands in the U.S. have been destroyed, including 95 percent of the San Francisco Bay's original wetlands, 22 percent of Rhode Island's wetlands, 85 percent of seagrass meadows in Galveston Bay, and 25,000 acres annually of coastal marshes in Louisiana.

The destruction of wetlands also harms the recreation, tourism, and fishing industries that rely on the species supported by this critical habitat. S. 2282 would extend the authorization of this successful conservation program through 2017.

Thank you again to everyone who is here to speak on behalf of these important programs, and I look forward to future action on both pieces of legislation in this Committee.

STATEMENT OF HON. JEFF SESSIONS,
U.S. SENATOR FROM THE STATE OF ALABAMA

Good morning.

Thank you, Chairman Cardin, for holding today's hearing. We have a long list of bills on the agenda.

Before considering new bills—particularly if they will result in new spending—we should give serious consideration to our Nation's fiscal situation. In fiscal year 2013 our Government will run the fifth consecutive deficit over $1 trillion. We have to act now to ensure that all Federal agencies and programs are operating as efficiently as possible; that means at the lowest possible cost. In all programs we need to look for new ways to maximize the return on Federal taxpayer dollars. We also need to consider the costs and benefits very carefully before creating new programs. We should not ask taxpayers to authorize spending more than is absolutely necessary. I believe that until the Senate and this Administration get serious about passing a budget that sets spending priorities and addresses our debt problem the American people should not be asked to send one more dime in new taxes to Washington.

With that said, there are several bipartisan bills on today's agenda that merit this Committee's full consideration. Several bills on our agenda deal directly with issues of importance to our Nation's hunters and sportsmen. For instance, S. 1249, the Target Practice and Marksmanship Training Support Act, which is sponsored by Senators Baucus, Begich, Bennett, Hagan, Klobuchar, McCaskill, Risch, and Tester, would amend the Pittman-Robertson Wildlife Restoration Act to expand the avail-

ability of target practice facilities on Federal lands. I think we should give this legislation a close review.

I also agree with the concept of allowing States to use electronic duck stamps instead of the more expensive paper stamps. S. 2071, the Permanent Electronic Duck Stamp Act of 2012, which is sponsored by Senators Wicker, Baucus, and Pryor, would authorize the States to issue electronic duck stamps instead of the current paper form.

The National Fish & Wildlife Foundation (NFWF) program has also been an effective program that has helped conserve wildlife across the Nation. As just one example, NFWF partnered with Southern Company to invest over $7 million in projects to restore more than 61,000 acres of longleaf pine forest in the southeastern United States. I look forward to hearing more about the NFWF program this morning.

I also appreciate the work of Senator Inhofe in introducing the North American Wetlands Conservation Act (NAWCA) reauthorization bill. Alabama currently has several NAWCA projects in the Mobile-Tensaw Delta that are conserving more than 47,000 acres of wildlife habitat. NAWCA is a voluntary program that does not seek to impose unwarranted new regulations on landowners.

Voluntary, cooperative wetlands programs like NAWCA stand in stark contrast to the Obama administration's command and control environmental agenda that is reflected in many of the Administration's recent initiatives, including their "wetlands guidance document." Last month, I joined Senators Inhofe, Barrasso, and Heller in introducing S. 2245, the Preserve the Waters of the U.S. Act, which would block the Administration's new "wetlands guidance" document from going into effect. Our bill, which has 32 cosponsors, would prevent the Administration from bypassing Congress and the regulatory approval process to vastly expand its jurisdiction over lands and waters across the country. Mr. Chairman, I would respectfully ask that our Committee include the Preserve the Waters of the U.S. Act on the agenda of our next legislative hearing or markup.

Finally, I understand that many people are concerned about the treatment of chimpanzees in research facilities. S. 810, the Great Apes Protection Act, is intended to end invasive research on great apes. Scientific research that can cure diseases for humans and animals is so important that we must think this issue through carefully. I have heard from stakeholders on both sides of this important issue, and I look forward to hearing the testimony this morning.

Thank you.

[Additional material submitted for the record follows:]

Testimony for the Record of the Senate Environment and Public Works Committee Subcommittee on Water and Wildlife

by the

National Chimpanzee Research Facility Directors

Regarding

The Great Ape Protection and Cost Savings Act

Christian Abee, D.V.M, M.S., DACLAM
Director, Michale E. Keeling Center for Comparative Medicine and Research
University of Texas MD Anderson Cancer Center

Thomas J. Rowell, D.V.M.
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John L. VandeBerg, Ph.D.
Director, Southwest National Primate Research Center, and
Chief Scientific Officer, Texas Biomedical Research Institute

Stuart Zola, Ph.D.
Director, Yerkes National Primate Research Center
Emory University

May 8, 2012

Introduction

We, Drs. Christian Abee, Jeff Rowell, John VandeBerg, and Stuart Zola, are the directors of the four research facilities that provide access to the national chimpanzee research resource by investigators and commercial companies in the United States, as well as those from other countries. Together with the Alamogordo Primate Facility (APF), our facilities make up the National Chimpanzee Resource Consortium (NCRC) whose mission is to provide information and guidance about the national chimpanzee research resource to Congress, federal agencies, the biomedical research community, and the public and to make chimpanzees available to researchers, along with the specialized technical capabilities required for that research. We appreciate the opportunity to submit testimony regarding the Great Ape Protection and Cost Savings Act (GAPCSA), S.810, a bill that would stop the use of chimpanzees in biomedical research and the breeding of chimpanzees for research purposes, and would retire government-owned chimpanzees to sanctuaries. We present our testimony against this bill on behalf of scientists and commercial companies who require continued access to chimpanzees for vital biomedical research aimed at preventing human morbidity and mortality, and on behalf of the millions of Americans whose lives will be saved or vastly improved if chimpanzees continue to be accessible for biomedical research under the stringent guidelines established in the recent Institute of Medicine (IOM) report, Chimpanzees in Biomedical and Behavioral Research: Assessing the Necessity (2011).

IOM Recommendations and National Institutes of Health Working Group Deliberations

We fully support the recommendations in the Institute of Medicine (IOM) report and the charge to the NIH Working Group on the Use of Chimpanzees in NIH-Supported Research.

The IOM committee clearly recognized the continuing need for biomedical research with chimpanzees. For example, the report stated that "a new, emerging, or re-emerging disease or disorder may present challenges to treatment prevention, and/or control that defy non-chimpanzee models," that "comparative genomics research may be necessary for understanding human development, disease mechanisms, and susceptibility," and that "chimpanzees may be necessary for obtaining otherwise

unattainable insight to support understanding of social and behavioral factors that include the development, prevention, or treatment of disease." Recognizing the need for continued biomedical research with chimpanzees, the committee proposed a set of criteria by which each proposed research protocol with chimpanzees will be evaluated to determine whether chimpanzees should be used for that project, and it recommended that NIH establish "an independent oversight committee that uses the criteria" to judge the merits of the proposed experiment. NIH has since established the Working Group to provide guidance on the implementation of recommendations in the IOM report.

The process is working exactly as proposed by the IOM and supported by the NCRC. **It would be completely inconsistent with the IOM recommendations to pass the proposed Great Ape Protection and Cost Savings Act, which seeks to put an end to biomedical research with chimpanzees at a time when a year-long study by a prestigious and balanced IOM committee concluded that biomedical research with chimpanzees is necessary today and is likely to be necessary to combat new diseases in the future.** It would be prudent to allow the process to continue under the able leadership of the NIH.

Unfounded Emotional Arguments Versus Improved Human Health

Although GAPCSA pertains only to chimpanzees, the fundamental tenant of the Humane Society of the United States (HSUS) and the Physicians Committee for Responsible Medicine (PCRM), two of the strongest proponents of GAPCSA, is that all biomedical research with animals should be banned. Through the use of animals, including chimpanzees, in biomedical research, scientists have learned enough about human physiology and immunology that some areas of research no longer require animals for scientific and medical advancement. Science is highly competitive, and when scientists can use tissue cultures, computer models, and/or human subjects to advance science and medicine, they do so at a great saving of funds in their tight research budgets. When animals are necessary, they use the lowest possible animal species by which the goals of the study can be achieved. Only when all other

possible experimental routes have been considered and judged not to be able to achieve the goals in a timely manner are chimpanzees used for research.

Chimpanzees have played a critical role in the development of vaccines for polio, hepatitis A, and hepatitis B, as well as in the development of drugs to treat hepatitis, many types of autoimmune diseases, and some forms of cancer. They are being used today to develop a vaccine for hepatitis C and better drugs for treating hepatitis B and C, as well as drugs known as humanized monoclonal antibodies that will be more effective as treatments for autoimmune diseases and cancers. According to the CDC, approximately 3.2 million Americans are chronically infected with hepatitis C virus. The World Health Organization estimates that 130-170 million people are chronically infected with the virus worldwide, and many of them don't even know yet that they are infected. Tens of millions more are or will become victims of autoimmune diseases and cancer.

If the use of chimpanzees in biomedical research speeds up the discovery of preventions or therapies for these diseases by even a few years, the number of lives saved will be enormous. Less than 1,000 chimpanzees are available for research in this country and less than 100 are actually assigned to research protocols at any point in time (the others may be resting between protocols or held in reserve until a project is proposed that requires their particular biological characteristics). In comparison, virtually all Americans lead better lives because of the various drugs and vaccines developed from research with chimpanzees, and millions will benefit in the future if biomedical research with chimpanzees is continued under the strict criteria proposed by the IOM committee.

GAPCSA is about unfounded emotional arguments versus improved human health. Which do we as a society value more — preventing morbidity and mortality of millions of Americans or the unfounded notion of putting an end to necessary research with fewer than 1,000 well cared for chimpanzees? The four of us are among the millions of people who are likely to benefit from continued research with chimpanzees, and we urge the elected representatives of this country to value health, quality of life, and longevity for all Americans at a higher level.

Invasive Research

Proponents of GAPCSA have argued that invasive research with chimpanzees is cruel and should be banned by the passage of the bill. **What is meant by invasive research is so broadly defined in the legislation that it would prevent procedures as simple as collecting a blood sample from an arm vein or injecting the animal with a vaccine. These simple procedures, which are used every day in clinical medicine and clinical research with people, comprise the vast majority of procedures used in research with chimpanzees.** Another procedure that is sometimes used is a liver biopsy, sometimes called a needle biopsy or a punch biopsy. This procedure is used in hepatitis research to assess the disease status or the level of hepatitis virus in the liver. This form of liver biopsy is commonly used repeatedly with people who have hepatitis or other liver diseases, or who have had a liver transplant. It is typically conducted as an outpatient procedure under local anesthetic. In chimpanzees, it is conducted under general anesthetic. Notably, almost all research chimpanzees have been trained to volunteer to present an arm to be injected for sedation for a health check or an experimental or clinical procedure. A high priority goal in research with chimpanzees is to make the procedures as stress-free as possible for them, as an ethical imperative which also contributes to valid scientific results.

Continued Importance of Biomedical Research with Chimpanzees

Testimony has been presented to the subcommittee claiming that use of the chimpanzee model is obsolete. To the contrary, as recognized by the IOM committee, **biomedical research with chimpanzees continues to be vital to the importance of human health and to the development of new preventions and therapies for common human diseases.** Whenever possible, medical products are brought to market without the use of chimpanzees. As we learn more from research with animals, including chimpanzees, it will be possible in the future to bring even more products to market without the use of chimpanzees. However, we are still struggling to understand some fundamental aspects of some diseases, such as hepatitis C, for which only chimpanzees serve as a valid model. Basic research with

chimpanzees is required to develop that understanding so it can be harnessed to develop a vaccine and better drugs to treat this deadly virus. It is not possible at this time to conduct all forms of pre-clinical research with other animals and to get the candidate products to market in a timely and safe manner, or even to get them to market at all.

For example, in recent months, a promising hepatitis C drug that was in Phase II clinical trials elicited some unexpected results in the human subjects. The FDA halted the trial and told the company that had developed the drug that additional pre-clinical studies would have to be conducted in order to determine the biological mechanism by which the drug elicited the unexpected effects. Because chimpanzees are the only animal that can be naturally infected with hepatitis C virus, the company had two choices: conduct research on the biological mechanism with chimpanzees or abandon the drug. If chimpanzees were not available, the drug would be abandoned, leaving millions of people without future access to its potentially life-saving benefits. In addition, the commercial company would lose tens of millions if not hundreds of millions of dollars that it had already invested in developing the drug. This scenario is not uncommon, and the loss of opportunity to use chimpanzees in research would not only be devastating to the advancement of medicine but also would be severely damaging to the financial success of American pharmaceutical companies and to the economy.

The subcommittee has received testimony that two new drugs for treating hepatitis C have been brought to market without the use of chimpanzees. While it is true that those drugs were not tested using chimpanzees in pre-clinical research, it is not true that they were brought to market without the use of chimpanzees. In fact, development of those drugs depended heavily on prior basic research with chimpanzees that enabled us to understand what types of drugs might best be able to prevent hepatitis C virus replication in infected individuals. Most HCV anti-viral drugs that reached human trials without prior testing in chimpanzees did so because proof-of-concept studies had already been successfully conducted with chimpanzees using similar drugs against the same viral targets. While previous research with chimpanzees enables some new drugs to be brought to market without preclinical testing in chimpanzees, it is not practical to develop entirely new classes of drugs without the use of chimpanzees,

and it is not ethical to test them in humans prior to pre-clinical research with chimpanzees. Banning the use of chimpanzees in research would curtail the development of entirely new classes of drugs intended to improve health and quality of life for humans.

The subcommittee also received testimony that is it possible to bring a hepatitis C vaccine to market without testing in chimpanzee. **The fact is that no hepatitis C vaccine has yet been brought to market, and 80,000 more Americans become infected every year. It is imperative that we do everything possible to halt this epidemic, which contributes enormously to the burden of health-care costs as well as to morbidity, mortality, and lost economic productivity.** It was not possible for vaccines for polio, hepatitis A, or hepatitis B to reach patients without research with chimpanzees, and nobody knows whether it is possible to bring a vaccine for hepatitis C to market without chimpanzees. What we do know is that **if we continue to allow chimpanzees to be used for hepatitis C vaccine development, the competitive forces of science and its commercialization will get a vaccine to market as fast as is possible, whether or not it is a vaccine that was developed with chimpanzees. Eighty thousand newly infected Americans per year is too heavy a personal and medical burden on our society to risk delaying the development of a vaccine by banning research with chimpanzees. Furthermore, based on the scientific pathways taken in developing vaccines for hepatitis A and B, access to chimpanzees for hepatitis C vaccine development is likely to save time, and the time saved will save many lives.**

Absence of Disease Progression in Chimpanzees

Proponents of GAPCSA have argued that because chimpanzees that are infected with hepatitis B virus, hepatitis C virus, or HIV do not progress to disease, they are not useful models of research. To the contrary, they are ideal models for developing vaccines that prevent infection by these viruses, and they are ideal models for developing therapies that prevent viral replication in infected individuals. If we can prevent the virus from replicating in infected people, we will prevent the disease from progressing. We do not need an animal model of end stage disease, since the goal of the research is to stop infection

from ever occurring or to stop viral replication in infected people. Achieving either of these goals will mean there will be no end stage disease in people.

The subcommittee received testimony that there have been 200 HIV vaccine experiments with chimpanzees and that none of them proved to be fruitful. In fact, the HIV vaccine experiments with chimpanzees were highly informative. In the early stages of the AIDS epidemic, dozens of candidate vaccines were developed by academic scientists and commercial companies around the country. To test each of them in humans was not practical; an AIDS vaccine trial in people requires several thousand uninfected people from high risk populations and years to assess the level of protection, if any, afforded by the vaccine. Each of these candidate vaccines was administered to chimpanzees, typically two to four chimpanzees, and then the chimpanzees were inoculated with HIV. For each experiment, we learned in weeks that the candidate vaccine was not effective in blocking HIV infection. We also learned a great deal about the human immune response against HIV. That work, which could not have been done with human subjects, paved the way for entirely new strategies for HIV vaccine development, which are currently being implemented.

Another research initiative with chimpanzees led to the development of a humanized monoclonal antibody that can block infection by HIV in instances of accidental exposure in laboratory or hospital environments. Two chimpanzees were inoculated with HIV and then given the antibody 1 hour later. The antibody conferred complete protection and later generations of the antibody have proceeded to clinical trials. **This product offers great hope to the medical and research personnel who are devoted to treating patients or developing preventions or cures for AIDS and are at high risk of accidental exposure. Furthermore, this product is now in Phase 2 clinical trials as a treatment for AIDS patients who are refractory to conventional treatment. It could not have been developed without research with chimpanzees, and future products that are aimed at post-exposure treatment of accidental infections of pathogens that can infect only humans and chimpanzees also will require research with chimpanzees. A similar antibody to HCV was developed in**

chimpanzees, and it is in clinical trials to prevent reinfection of the liver in patients receiving liver transplants.

Bans on Chimpanzee Research by Foreign Governments

It has been well publicized that many foreign governments have banned research with chimpanzees, and that Gabon and the U.S. are the only countries that permit research with chimpanzees. This fact has been used in the argument that the U.S. also should ban research with chimpanzees. However, what is not well known is that with the exception of the Netherlands, research with chimpanzees was never conducted in any of those countries, so it was politically expedient to ban an activity that never occurred. It also is not well known that academic scientists and commercial companies from foreign countries have depended on the U.S. chimpanzee research to conduct the experiments required to develop the products they wanted to bring to market. In recent years, our chimpanzee resources have been accessed by scientists and commercial companies located in Australia, Belgium, Canada, Denmark, France, Italy, Japan, South Korea, and Spain. Some of the investigations were funded in part by the governments of those very same countries that have banned research with chimpanzees. **Not only have the results of the research conducted with chimpanzees by foreign scientists at U.S. facilities led to new understanding about pathogenesis and host-pathogen interactions, they have also led to the marketing of vital drugs, including one that is now used to treat childhood leukemia.** The influx of funds for these studies from foreign countries to the U.S. also has supported in part the maintenance of our national chimpanzee resource, a cost that will be borne by the U.S. government if it bans research with chimpanzees.

Attached is a cover note and a letter (September 26, 2011) provided to the IOM committee by 97 prominent scientists, including several Nobel Laureates and members of the U.S. National Academy of Sciences, explaining the critical importance of chimpanzees for research on hepatitis. More than half the scientists who signed the letter are from countries in which research with chimpanzees is not conducted. Those countries were Australia, Canada, China, Denmark, France, Germany, Holland, Italy, Japan,

South Korea, Singapore, Spain, Switzerland, Taiwan, and the United Kingdom. While many of those scientists do not use chimpanzees in their own research programs, the letter provides persuasive documentation of the vital importance of chimpanzees in combating the current hepatitis B and C pandemics.

New, Emerging, or Reemerging Diseases

The Subcommittee received testimony that chimpanzees are not useful for responding to new public health threats because it takes too long to ramp up research with chimpanzees. This argument is exactly opposite of the conclusions reached by the IOM committee. In fact, as reported on page 65 of the IOM report, **The NIH "has identified eight instances over the last two decades where research on new (or newly recognized), emerging, and reemerging infectious diseases has called for use of chimpanzees to answer crucial questions pertaining to pathogenesis, prevention, control, or therapy. In five of these the chimpanzee is still being used." There is no reason to believe that this pattern of newly discovered diseases that mandate research with chimpanzees as a public health measure will not continue.** It is not possible to predict what these diseases will be and when they will be discovered, but like HIV discovered in the early 1980s and the hepatitis C virus discovered in 1989, some of them are almost certain to lead to worldwide pandemics. It is critical that a national chimpanzee research resource be maintained so that it can be utilized immediately when new diseases are identified.

The emergency provision proposed for GAPCSA would make it impossible to quickly respond to the need for chimpanzees in future research on newly discovered diseases. If GAPCSA were to become law, research chimpanzees would be moved to sanctuaries where they would no longer be trained to voluntarily participate in research procedures, chimpanzee research facilities and technical staff would be repurposed for other types of research (or would lose their jobs), and skills for managing research chimpanzees and conducting procedures with them would be lost. When an emergency arose, it would take years for public debate to determine if chimpanzees should be used to address it, for recreating

chimpanzee facilities at research institutions, for training veterinarians and technical staff to work with chimpanzees, and for training chimpanzees to participate in the research. In essence, there would be no capacity anywhere in the world for using chimpanzees if an emergency response to the threat of a new disease became necessary.

Critical Importance of Research with Captive Chimpanzees to Survival of Wild Chimpanzees and Gorillas

If the research population of chimpanzees is relegated to sanctuaries, research on diseases that affect both humans and grant apes will be terminated. Historically, the use of chimpanzees to develop the polio vaccine, in turn, benefitted chimpanzees that experienced a polio epidemic. Currently, research with chimpanzees aimed at developing vaccines for AIDS and Ebola may be a key factor in saving chimpanzees and gorillas from extinction.

When an epidemic of polio occurred among the chimpanzees of Gombe, killing some and crippling others, an oral human polio vaccine was provided in food and the outbreak was halted (Lawick-Goodall, J.V. The Behavior of Free-living Chimpanzees in the Gombe Stream Reserve. Animal Behavior Monographs, Part 3, Vol. 1. J.M. Cullen and C.G. Beer, eds. Bailliere, Tindall and Cassell, London, 1968, p. 170). If a polio vaccine had not been developed, it is likely that polio epidemics would have since decimated wild chimpanzee populations (and some human populations), particularly as wild chimpanzees and humans came to live in much closer proximity in recent decades.

Today, Ebola is decimating wild populations of chimpanzees and gorillas, and contributing to their extinction. However, a first-generation candidate vaccine has been developed in research with monkeys and was tested for its capacity to elicit an immune response in chimpanzees. It is now being used on a trial basis on wild gorillas. If research were no longer permitted with captive chimpanzees, the development of vaccines to save the lives of wild great apes would be halted. While it might be possible to obtain a waiver to do this type of research, there would be no research population of chimpanzees on

which it could be done because the research populations would have been disbanded and the technical capacity and infrastructure required to conduct this type of research would have been lost.

Similarly, chimpanzee AIDS, which is caused by a chimpanzee-specific simian immunodeficiency virus (SIV), is killing large numbers of wild chimpanzees (Keele, B.F. et al. Increased mortality and AIDS-like immunopathology in wild chimpanzees infected with SIVcpz. Nature 460:515-519-2009. Weiss, R.A., and Heeney, J.V. An ill wind for chimps? Nature 460:470-471,2009). If we lose access to captive chimpanzees as research subjects, we will have little hope of developing a vaccine and ensuring that it would be safe and effective for protecting wild populations of chimpanzees from AIDS. **We do not know what new diseases will emerge in humans or chimpanzees in the years and decades ahead (chimpanzee AIDS has been known for only a few years). Removing chimpanzees from the arsenal of model systems available to combat the pandemics of the future could be devastating to both species.**

Cessation of the Breeding of Chimpanzees for Research Will Contribute to Risk of Extinction

GAPCSA would put an end to breeding chimpanzees for use in research. Most of the nearly 1,000 chimpanzees available for use in research were produced at research facilities. These animals comprise most of the captive chimpanzees in the world. **If chimpanzees can no longer be used for research and bred for research, this population will become extinct and will not be available for protecting the survival of the species. However, if chimpanzees continue to be bred for research, the research population will serve as a reservoir that could be available to produce chimpanzees for repatriation to suitable protected habitats in Africa if the wild population becomes extinct.**

Status of Chimpanzees Maintained at the Alamogordo Primate Facility (APF)

The Subcommittee received testimony that there are approximately 200 chimpanzees at APF that are old, sick, and not useful for research. In fact, there are 172 chimpanzees at APF and 107 of them (62 percent) are less than 30 years old. Chimpanzees can live to be 50 years old or

more, so most of the chimpanzees at APF are no more than middle aged. It is true that many of these chimpanzees have been infected with hepatitis B virus, hepatitis C virus, or HIV, but the implication of previous testimony that these animals are sick as a consequence of those infections is misleading. As stated previously, chimpanzees do not develop those diseases when they are infected with the respective viruses. Not only is the APF population of chimpanzees generally healthy, but, in fact, the most desperately needed chimpanzees today for biomedical research are those that are infected with hepatitis B virus or hepatitis C virus. We need them to conduct research aimed at developing a better understanding of how the viruses can evade the host immune system and why it is that the best drugs developed to date cannot eradicate the hepatitis B virus (or in some people the hepatitis C virus) and therefore cannot cure the patients. Delays in moving the APF chimpanzees to a facility where they can be used in research are contributing to delays in developing better drugs as well as a vaccine for hepatitis C. These delays translate to thousands of human lives.

Living Conditions and Medical Care for Chimpanzees at Research Facilities

The Subcommittee heard testimony that research facilities cannot provide for the complex social and psychological needs of chimpanzees and that chimpanzees at research facilities are depressed and suffer from multiple organ failure. That testimony was patently false.

Chimpanzees at research facilities are socially housed, as they are at sanctuaries and at APF, in indoor-outdoor facilities and with many enrichment devices and activities. Research facilities, as well as sanctuaries and APF, house many of their chimpanzees in primadomes, indoor-outdoor caging of similar proportions to primadomes or with large playground attachments and, at some facilities, corrals.

However, a major difference between research facilities and APF on the one hand, and the best of sanctuaries on the other, is that the former have large veterinary, animal care, and behavioral services staffs, extensive clinic and hospital facilities, and sophisticated diagnostic pathology laboratories and pathology personnel. These research facilities can provide specialized resources that are critical to the health and well-being of the chimpanzees because they have large populations of non-human primates

other than chimpanzees. Most sanctuaries have no onsite veterinarians; none has more than one, and none has an onsite pathology laboratory at which illnesses can be diagnosed and treated immediately.

Furthermore, the extensive behavioral services and enrichment staffs at research facilities have taught almost all of the chimpanzees to voluntarily participate in injections for sedation or immunization. In contrast, most chimpanzees at sanctuaries and zoos must be shot with a dart gun in order to undergo an annual physical examination or for treatment of injuries.

Finally, the extensive veterinary staff at research facilities are able to quickly provide care for sick chimpanzees, such as those that have diabetes, and are well trained to present an arm each day for an insulin injection. The national sanctuary (Chimp Haven) has refused to accept some chimpanzees that had diabetes or other health conditions because it did not have the staff required to care for them. As the chimpanzees age over the next 20-30 years, many of them will develop diabetes and other medical conditions just as aging people do, and some will attain ages in excess of 50 years old (equivalent in many respects to a 90-100 year old person). The research facility veterinarians have many years of experience in caring for elderly and sick chimpanzees and have state-of-the-art medical diagnostic and treatment capacity.

The chimpanzees maintained at research facilities and those maintained at sanctuaries are generally healthy and their complex social and psychological needs are well provided for as they live in social groups in indoor/outdoor housing. However, only one sanctuary in the U.S., Chimp Haven, is accredited by the Association for Assessment and Accreditation of Laboratory Animal Science, International, is mandated to conform to the Public Health Service Policy on the Humane Care and the Use of Laboratory Animals, and is inspected routinely by the USDA. Unlike most sanctuaries, all chimpanzee research facilities are subject to these provisions, and they have the highest possible capacity to provide medical care as well as training of the animals to cooperate in routine clinical (and research) procedures.

Cost of Maintaining Chimpanzees

The Subcommittee heard testimony that the passage of GAPCSA would save the taxpayer more than $300 million over 10 years. This assertion has no basis in fact.

Research facilities are intrinsically more cost-effective than sanctuaries in maintaining chimpanzees (and other animals that are used for research) for several reasons:

1. Economy of scale. Because research facilities that maintain chimpanzees also maintain large numbers of monkeys, they have economies of scale in staffing, medical, and other expenses that are not possible at chimpanzee sanctuaries.
2. Some institutions at which research colonies reside contribute funding to partially support the colonies at those institutions.
3. Research facilities already have the capacity to house all the chimpanzees that are available for research, including those maintained at APF, whereas new facilities would have to be constructed at sanctuaries to house more chimpanzees (i.e., Chimp Haven and all other sanctuaries are filled to capacity).

An example of government cost savings for chimpanzees at research facilities is the cost differential of chimpanzees maintained at APF, where no research is conducted and no funds are provided by the institution that maintains the animals, by comparison with maintaining the same chimpanzees at the Southwest National Primate Research Center (SNPRC), where NIH has proposed to move them. It costs taxpayers $5 million each year to maintain those chimpanzees at APF whereas it would cost taxpayers only $3 million to maintain them at the SNPRC. Each year that the move is delayed it is costing the taxpayers $2 million, and the chimpanzees are not available to contribute to critical research initiatives particularly on hepatitis B and C.

The NIH has conducted an assessment of the cost to taxpayers of maintaining chimpanzees at research facilities, at APF where research cannot be conducted and where only chimpanzees are maintained so there is no economy of scale, and at the national sanctuary: (http://grants.nih.gov/grants/policy/air/cost_for_caring_housing_of_chimpanzees.htm) October 31, 2011.

It concluded that the average cost to the taxpayer per chimpanzee per day at our four research facilities is $34.50, whereas the cost at APF is $67.40 per day, and the cost at the national sanctuary (which covers some expenses through donations) is $46.70 per day.

It is noteworthy that the taxpayer cost of maintaining chimpanzees at sanctuaries would probably escalate if more chimpanzees were sent to sanctuaries because the sanctuaries already are generating as much revenue as possible from donations to sustain current operations. Acquisition of additional chimpanzees is not likely to be accompanied by acquisition of more donations, so the taxpayers would be required to cover the entire cost of maintaining any additional chimpanzees moved to sanctuaries as well as the cost of constructing new housing for them. Development of additional sanctuaries would also result in additional infrastructure costs.

There would be no cost savings from moving the research population of chimpanzees to sanctuaries. To the contrary, there would be a major additional cost burden to the taxpayers.

Conclusion

In conclusion, we respectfully ask you to consider our testimony and not to pursue GAPCSA further. **The IOM's publicly available Report Brief also concluded, "The committee recognizes how disruptive an outright ban would be, affecting animal care and potentially causing unacceptable loses to the public's health. What's more, chimpanzees may prove uniquely important to unraveling the mystery of diseases that are unknown today."**

The passage of GAPCSA would be a great tragedy to millions of Americans who are ill or are going to become ill from diseases that may be prevented or ameliorated by research with chimpanzees, to wild chimpanzees and gorillas that are being devastated by AIDS and Ebola, and to the taxpayers who would have to cover the total (or nearly total) costs of maintaining the chimpanzees removed from research resulting in the need to construct new housing at sanctuaries. The process established by the IOM Committee and being implemented by the NIH Working Group is functioning well to ensure that chimpanzees are only used for research when

absolutely necessary while also ensuring that the advancement of science and medicine continues at maximal speed to alleviate suffering and to prevent the premature and unnecessary death of millions of Americans.

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American Littoral Society * American Rivers * Delaware Highlands Conservancy * Delaware Nature Society * Delaware Riverkeeper Network * Friends of the Upper Delaware River * National Wildlife Federation * New Jersey Audubon Society * Partnership for the Delaware Estuary * Pennsylvania Environmental Council * Delaware Chapter of The Nature Conservancy * New Jersey Chapter of the Nature Conservancy * New York Chapter of The Nature Conservancy * Pennsylvania Chapter of The Nature Conservancy * Pinchot Institute for Conservation

September 22, 2011

The Honorable Barbara Boxer
Chairwoman, Senate Committee on Environment and Public Works
U. S. Senate
Washington, DC 20510

The Honorable James Inhofe
Ranking Member, Senate Committee on Environment and Public Works
U. S. Senate
Washington, DC 20510

CC:
The Honorable Ben Cardin, Chairman, Subcommittee on Water and Wildlife
The Honorable Jeff Sessions, Ranking Member, Subcommittee on Water and Wildlife

Dear Chairwoman Boxer and Ranking Member Inhofe,

We are writing to request action on the Delaware River Basin Conservation Act (S. 1266), which provides a framework for making substantial progress towards the protection and restoration of the ecologically and economically significant Delaware River Basin. The Delaware River Basin is the largest drinking water supplier in the MidAtlantic, supports a multi-billion dollar economy in the form of fisheries, recreation, and tourism, and provides valuable wildlife habitat. After experiencing two consecutive catastrophic flooding events, the Delaware River Basin requires attention now more than ever. Action outlined in this bill is essential for the sustainable future of the Delaware River Basin and the tremendous benefits it provides. The Delaware River Basin Conservation Act was introduced and referred to the Committee on Environment and Public Works on June 23, 2011.

The bill would require the U.S. Fish and Wildlife Service, in partnership with other federal agencies, to establish the Delaware River Basin Restoration Program to increase coordination and collaboration of conservation efforts currently underway in the entire Basin. Concurrently, the legislation would provide for the creation of a competitive grants program--along with much-needed technical assistance--to add to the limited federal resources available to the watershed. The involvement of the Environmental Protection Agency and the Army Corps of

Engineers is important to the success of this inter-agency partnership to restore and protect the Delaware River Basin.

The Delaware River Basin is unique, economically and ecologically important, and deserves the attention of the Committee while considering legislation for other regional watershed protection efforts. We believe it is a critical time to elevate the profile of the Delaware River Basin, and urge action regarding the Delaware River Basin Conservation Act.

Sincerely,

Tim Dillingham
Executive Director
American Littoral Society

Laura Craig, PhD
Associate Director, River Restoration Program
American Rivers

Sue Currier
Executive Director
Delaware Highlands Conservancy

Michael Riska
Executive Director
Delaware Nature Society

Maya K. van Rossum, the Delaware Riverkeeper
Delaware Riverkeeper Network

Dan Plummer
Chairman of the Board
Friends of the Upper Delaware River

Tony Caligiuri
Regional Executive Director
National Wildlife Federation

Kelly Mooij, Esq.
Government Relations Director
New Jersey Audubon

Jennifer A. Adkins
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Patrick Starr
Senior Vice President, Southeast Region
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V. Alaric Sample, PhD
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Roger L. Jones, Jr.
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Rick Werwaiss
Executive Director, Eastern New York Chapter
The Nature Conservancy

Bill Kunze
Pennsylvania State Director
The Nature Conservancy

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