

**GONE WITH THE WIND:
IMPACTS OF WIND TURBINES
ON BIRDS AND BATS**

OVERSIGHT HEARING

BEFORE THE
SUBCOMMITTEE ON FISHERIES, WILDLIFE
AND OCEANS

OF THE
COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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Tuesday, May 1, 2007
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**OVERSIGHT HEARING: “GONE WITH THE
WIND: IMPACTS OF WIND TURBINES ON
BIRDS AND BATS”**

**Tuesday, May 1, 2007
U.S. House of Representatives
Subcommittee on Fisheries, Wildlife and Oceans
Committee on Natural Resources
Washington, D.C.**

The Subcommittee met, pursuant to call, at 10:04 a.m. in Room 1324, Longworth House Office Building. Hon. Madeleine Z. Bordallo [Chairwoman of the Subcommittee] presiding.

Present: Representatives Bordallo, Kildee, Rahall and Sali.

**STATEMENT OF THE HONORABLE MADELEINE Z. BORDALLO,
A REPRESENTATIVE IN CONGRESS FROM THE TERRITORY
OF GUAM**

Ms. BORDALLO. The oversight hearing by the Subcommittee on Fisheries, Wildlife and Oceans will now come to order.

The Subcommittee is meeting today to investigate wind energy and its effects on wildlife, specifically, negative impacts on protected bird and bat populations. Pursuant to Committee Rule 4[g], the Chairman and the Ranking Minority Member will make the opening statements. If any other Members have statements, I invite you to submit them for the record.

This morning’s hearing, entitled “Gone with the Wind: Impacts of Wind Turbines on Birds and Bats,” will continue the committee’s series of investigations, exploring renewable alternative energy sources as options to reduce our nation’s dependence on non-renewable fossil fuels.

From the outset, we need to recognize the obvious reality that any future reduction in fossil fuel emissions will be made possible only through better energy conservation and the development of alternative energy sources. Many analysts believe wind energy is an economic alternative because wind turbines emit no harmful greenhouse gas emissions, and are capable of generating electricity on a utility-sized scale.

Consequently, wind energy has been viewed conventionally as a green energy technology. In fact, Congress has acted over the past 20 years to provide financial incentives to encourage the private sector development of wind energy, and the industry has

responded. In 2002, wind power generating capacity jumped by 27 percent, and comparable growth is projected for 2007 and beyond.

Yet recently studies documenting substantial bird and bat mortality associated with wind turbines in California and West Virginia indicate that our conventional wisdom concerning this technology may have been naïve, if not flat out wrong.

The committee will hear from this morning's witnesses about the degree of bird mortality that has been discovered at several wind projects now in operation. Witnesses will also testify that we can no longer assume that bat populations are not at risk from wind turbines. To the contrary, it appears that we know far too little about how bats interact with this technology to assume anything.

We will also investigate the adequacy or inadequacy of current Federal, state, and local oversight in permitting authorities concerning the development of wind turbine projects and the protection of our wildlife.

Of particular interest, witnesses will testify about the wind industry's compliance with longstanding wildlife conservation laws, especially the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Endangered Species Act, and Federal enforcement.

For example, a plain reading of the language of the Migratory Bird Treaty Act articulates an ambiguous authority for the Secretary of the Interior to protect over 800 listed species of migratory birds, and an abridged reading of Section 2 of the Act reads that "...unless and except as permitted by regulations, it shall be unlawful at any time by any means or in any manner to pursue, hunt, take, capture, or kill any migratory bird."

On its face, this language would appear to be as straightforward a directive as can possibly be written by Congress. But despite having a clearly expressed authority to protect birds from all sources of harm, it is surprising, if not alarming, to learn that the U.S. Fish and Wildlife Service has never prosecuted any wind power project for killing birds, even when the mortality has been documented and the cause of death irrefutable.

The committee needs to understand why the Federal government continues to allow protected birds to be incidentally killed when it has the directive to prohibit any action from harming birds, including the development and operation of wind turbines. This responsibility is even more critical considering the wind industry's plan to quickly bring more projects on line.

In closing, I want to make it clear that I do not oppose the development of wind energy. In certain circumstances, I am confident that this technology can provide genuine green power. The issue is not whether you support wind energy—we all do. Rather, the challenge is if we have the patience and the good sense to develop this promising source of alternative energy without causing significant harm to the wildlife we strive to protect.

And now as Chairwoman, I recognize Mr. Brown, or rather, Mr. Sali. Mr. Brown will be here momentarily, the Republican Member representing Mr. Brown for any statement that he may have.

[The prepared statement of Ms. Bordallo follows:]

**Statement of The Honorable Madeleine Z. Bordallo, Chairwoman,
Subcommittee on Fisheries, Wildlife and Oceans**

This morning's hearing entitled, "Gone with the Wind: Impacts of Wind Turbines on Birds and Bats," will continue the committee's series of investigations exploring renewable alternative energy sources as options to reduce our Nation's dependence on non-renewable fossil fuels.

From the outset, we need to recognize the obvious reality that any future reduction in fossil fuel emissions will be made possible only through better energy conservation and the development of alternative energy sources. Many analysts believe wind energy is a viable alternative because wind turbines emit no harmful greenhouse gas emissions and are capable of generating electricity on a utility-sized scale. Consequently, wind energy has been viewed conventionally as a "green" energy technology.

In fact, Congress has acted over the past 20 years to provide financial incentives to encourage the private sector development of wind energy. And the industry has responded—in 2006, wind power generating capacity jumped by 27 percent and comparable growth is projected for 2007 and beyond.

Yet recent studies documenting substantial bird and bat mortality associated with wind turbines in California and West Virginia indicate that our conventional wisdom concerning this technology may have been naïve, if not flat-out wrong.

The committee will hear from this morning's witnesses about the degree of bird mortality that has been discovered at several wind projects now in operation. Witnesses will also testify that we can no longer assume that bat populations are not at risk from wind turbines. To the contrary, it appears that we know far too little about how bats interact with this technology to assume anything.

We will also investigate the adequacy or inadequacy of current federal, state and local oversight and permitting authorities concerning the development of wind turbine projects and the protection of wildlife. Of particular interest, witnesses will testify about the wind industry's compliance with longstanding wildlife conservation laws, especially the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Endangered Species Act, and federal enforcement.

For example, a plain reading of the language of the Migratory Bird Treaty Act articulates an unambiguous authority for the Secretary of the Interior to protect over 800 listed species of migratory birds. An abridged reading of section 2 of the Act reads, "That unless and except as permitted by regulations,...it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, [or] kill...any migratory bird." On its face this language would appear to be as straightforward a directive as can possibly be written by the Congress.

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The committee needs to understand why the federal government continues to allow protected birds to be incidentally killed when it has clear authority to prohibit any action from harming birds, including the development and operation of wind turbines. This need becomes even more critical considering the fact that the wind industry is ramping up to quickly bring more projects on line.

In closing, I want to make it clear that I do not necessarily oppose the development of wind energy. In certain circumstances I am confident that this technology can provide genuine "green" power. The issue is not whether you support wind energy—we all do. Rather, the challenge is if we have the patience and good sense to develop this promising source of alternative energy without causing significant harm to the wildlife we strive to protect.

**STATEMENT OF THE HONORABLE BILL SALI, A
REPRESENTATIVE IN CONGRESS FROM THE STATE OF IDAHO**

Mr. SALI. Thank you, Madam Chair. This is a statement actually that was prepared by Mr. Brown, and I am honored to read it on his behalf, and I will state for the record I do agree with him.

Two weeks ago we heard that carbon emissions are the greatest crisis facing mankind. While I suspect many people would find that statement an exaggeration today, we have an opportunity to do

something about that problem by examining the impacts of a clean, renewable, and safe alternative energy source.

Onshore wind power is growing at a rate of 22 percent each year, and it provides electricity for about 8 million Americans. More importantly, wind turbines produce no waste. They require no external fuel, and they create no air, water, or noise pollution. Unlike other fuels, they do not emit any carbon dioxide, nitrogen oxide, sulfur oxide or mercury into the environment. In fact, the existing U.S. wind turbine fleet displaces more than 19 million tons of carbon dioxide each year. To generate one megawatt of wind for 20 years, we would need to burn 29,000 tons of coal, or 92,000 barrels of oil.

Nearly two years ago the General Accounting Office submitted a report on the impacts of wind turbines on wildlife. While the GAO found that wind farms in northern California and West Virginia were killing certain bats and birds, their fundamental conclusion was that, in the context of other avian mortalities, it does not appear that wind power is responsible for a significant number of bird deaths.

More recently, the U.S. Fish and Wildlife Service has solicited names of individuals to serve on the Secretary's Wind Turbine Advisory Committee. These experts will provide advice, guidance, and recommendations to minimize impacts to wildlife relative to land-based wind energy facilities.

While I know that this hearing will focus, or will not focus on the Cape wind project in Massachusetts, I found it interesting that a senior staff member of Greenpeace noted that, "House cats in Hyannis killed more birds than this wind farm ever will."

Madam Chairwoman, we do not have to choose between onshore wind power or bird protection. In fact, I agree with the sentiments of the president of the National Audubon Society that, "Our challenge is to help design and locate wind power projects that mitigate the negative impact on birds."

If we are ever going to get serious about the development of alternative energy sources, wind power must be a part of the solution. We can produce this safe, clean, and renewable source of energy without killing large numbers of birds or bats. We can accomplish that by strengthening siting standards and by conducting pre-construction and biological surveys. Our energy policy can no longer be simply to say no to each and every energy source.

I look forward to hearing from our witnesses, and I am anxious to hear how wind power and wildlife can co-exist in the future. Thank you, Madam Chair.

Ms. BORDALLO. Thank you, Mr. Sali, for your opening statement, and now as Chairwoman, I have the honor and the privilege of recognizing for any statement he may have the esteemed Chairman of the Natural Resources Committee, Chairman Nick Rahall, an acknowledged expert on energy policy and a tireless advocate for the sensible use and conservation of our nation's natural resources.

Mr. Rahall.

**STATEMENT OF THE HONORABLE NICK J. RAHALL, II, A
REPRESENTATIVE IN CONGRESS FROM THE STATE OF WEST
VIRGINIA**

Mr. RAHALL. Thank you, Madam Chair, for that very kind introduction. I appreciate it, and certainly want to commend you, Chairman Bordallo, for your leadership on this important Subcommittee and for your interest in scheduling this morning's hearing. I have not yet heard what my colleague from West Virginia has to say except to say that I am sure I will agree with whatever he says.

He used to be a very valued member of this committee for his first term and a half here on Capitol Hill, and he has since left us for a higher calling, and that is to be a cardinal, but we still maintain our friendship, and certainly commend Alan for his superb leadership on this issue and so many issues important to our home state of West Virginia.

Today, we will shed light on the side of wind power that few ever hear about; namely, the real and growing threat of this technology on wildlife, especially birds and bats.

Two years ago I joined with my friend and dear colleague from West Virginia, from whom we will hear in a moment, Alan Mollohan, to request that the GAO investigate the environmental impacts of the birds in the wind industry in the Appalachian Highlands and across the country.

The GAO made two important findings abundantly clear in its September 2005 report. The first conclusion was that the wind industry is subject to relatively indifferent and ineffective environmental oversight. The second finding was that we know far too little about the negative effect that this technology has on bird and bat populations.

Since that time, permit applications have been growing in my state and elsewhere, but agency oversight has not kept pace either on the state or the Federal level.

For instance, in June 2003, the U.S. Fish and Wildlife Service published voluntarily interim guidelines to avoid or minimize the impacts of wind energy projects on wildlife and their habitat. Today, May 2007, as far as I know, these guidelines are still voluntary.

Meanwhile, I suspect that wind projects are on a regular basis in violation of the Migratory Bird Treaty Act and the Endangered Species Act, yet no enforcement action is being taken.

In conclusion, Madam Chair, the bottom line is that we cannot allow ourselves to wholeheartedly embrace wind energy at every location where a strong wind blows without first evaluating this technology in its entirety and having in place a responsible regulatory framework. This hearing will be a crucial step in reaching that endeavor.

Thank you for having this hearing.

[The prepared statement of Mr. Rahall follows:]

**Statement of The Honorable Nick J. Rahall, II,
Chairman, Committee on Natural Resources**

Thank you, Chairwoman Bordallo, for your leadership on this important subcommittee, and for your interest in scheduling this morning's hearing. Today we will shed light on the side of wind power that few ever hear about; namely, the real and growing threat of this technology on wildlife, especially birds and bats.

Two years ago I joined with my friend and colleague from West Virginia, Congressman Alan Mollohan, who also joins us here today, to request that the Government Accountability Office investigate the environmental impacts of the burgeoning wind industry in the Appalachian highlands and across the country.

The GAO made two important findings abundantly clear in its September 2005 report. The first conclusion was that the wind industry is subject to relatively indifferent and ineffective environmental oversight. The second finding was that we know far too little about the negative effect that this technology has on bird and bat populations.

Since that time, permit applications have been growing in my State and elsewhere, but agency oversight has not kept pace either on the State or Federal level.

For instance, in June of 2003, the U.S. Fish and Wildlife Service published voluntary interim guidelines to avoid or minimize the impacts of wind energy projects on wildlife and their habitat. Today, May of 2007, as far as I know these guidelines are still voluntary.

Meanwhile, I suspect that wind projects are on a regular basis in violation of the Migratory Bird Treaty Act and the Endangered Species Act, yet no enforcement action is being taken.

The bottom line is that we cannot allow ourselves to wholeheartedly embrace wind energy at every location where a strong wind blows, without first evaluating this technology in its entirety and having in place a responsible regulatory framework. This hearing will be a crucial step in that larger endeavor. Thank you.

Ms. BORDALLO. Thank you, Chairman Rahall, for your statement, and I would now like to recognize our first witness, our colleagues from West Virginia, Congressman Alan Mollohan, who has followed very closely the issue of wind energy development in his state and across his region.

Mr. Mollohan.

**STATEMENT OF THE HONORABLE ALAN B. MOLLOHAN, A
MEMBER OF CONGRESS FROM THE STATE OF WEST VIRGINIA**

Mr. MOLLOHAN. Madam Chairwoman, Minority Member Sali, my good friend and colleague, Mr. Rahall, I can think of no higher calling than balancing the environmental concerns we have with the ability to produce adequate, relatively inexpensive energy for this country which it has relied upon for its prosperity up to this time.

Madam Chairwoman, I want to commend the Subcommittee first for holding what I believe is the first congressional hearing on the impacts of wind turbines on wildlife, and I am grateful for the opportunity to appear before you today.

As Congressman Rahall mentioned, he and I have been very interested in this. I have been following his leadership, as usual, on this issue, and we have obviously a great concern because of the impact that wind energy not thoughtfully introduced into West Virginia might have on wildlife and also on viewsheds.

Wind energy developers have targeted the mountain ridges of our State of West Virginia, and for a number of years I have expressed my deep concern about their projects. Among the reasons for my concern are the environmental impacts of these massive projects, including their impacts on the natural beauty of our state, and their impacts on wildlife.

In the past, West Virginia's natural resources were exploited without regard to the long-term environmental consequences, and I think it is imperative that this not be allowed to happen again.

For anyone who has ever seen an industrial wind energy project on mountain ridges, it isn't at all surprising that they raise serious environmental concerns. For example, the Mountaineer Project,

which is in my district, consists of 44 turbines, each of which is about 340 feet high—in other words, 50 feet higher than the tip of the Capitol dome—and these turbines are spread out over 4,000 acres of mountain ridge.

This hearing could not be more timely. With last year's extension of the Federal tax subsidy for wind energy production, and with the concern over global warming, more attention is being paid to wind energy now than ever before, as the Ranking Member indicated.

But at the same time, there is mounting evidence that in at least some regions of the country—including the Mid-Atlantic Region—and in some circumstances, wind turbines have a devastating impact on wildlife. It is especially troubling that these reasons for this impact are largely unknown, and so real solutions to these problems simply are not in sight. Compounding these problems is the fact that critical information on the bird and bat populations, such as information on their size and migratory pathways, simply does not exist.

In short, there is little reason to believe that the wind energy projects that are being built in environmentally sensitive areas will be any less deadly to wildlife than those built in the past. The cumulative impact of all these projects on wildlife has to be of concern to Congress for at least two reasons.

First, all wind energy projects—those that are destructive of wildlife, as well as those that are not—are Federally subsidized through the Production Tax Credit. Almost certainly those projects would not exist but for this subsidy, and so Congress has a real responsibility to address this issue.

Second, the Federal wildlife protection laws are intended to prevent this kind of harm from occurring, and so it is also important for Congress to closely examine whether wind energy developers are complying with those statutes and whether any changes in the law are warranted.

To that end, I would like to devote the remainder of my statement to what is occurring in West Virginia regarding the construction and operation of wind energy projects. Because it is clear that West Virginia is an environmentally sensitive area, one would think that both developers and the state permitting agency—which is West Virginia Public Service Commission—would adopt a cautious approach to large, new projects. Unfortunately, that is not the case.

Currently there is one energy project operating in the state, the 44-turbine Mountaineer Project that I referred to earlier. It was the Mountaineer Project that, according to studies conducted in 2003 and 2004, killed thousands of bats during the study periods, resulting in estimates of mortality that, according to the Fish and Wildlife Service, "...are among the highest ever recorded in the world."

The Public Service Commission has approved the construction of three additional, much larger projects in the state—most recently, in August of last year, 124 turbine project. Two weeks ago the commission began hearings on yet another proposed project.

If these four projects are built as proposed, the number of turbines in the mountain ridges of West Virginia would jump by well more than 10-fold, to 584 turbines. If those data weren't sobering

enough, the Fish and Wildlife Service stated recently that it is reviewing six more wind energy projects that have been proposed for this state.

The facts relating to the project that was approved last August, the "Beach Ridge" wind energy projects, are particularly disturbing. That project was approved even though the developer's own environmental consultant predicted that the project would kill nearly 7,000 bats annually and thus would result in the same or greater mortality than had been recorded at the Mountaineer project.

Moreover, after carefully reviewing the plans for the Beach Ridge project, the Fish and Wildlife Service determined that before beginning construction, the developer should conduct specific, multi-year studies on the impacts that the project would have on bats and birds, but the developer rejected the agency's conclusions and instead conducted studies that were far more limited.

Even though the Public Service Commission decides applications under a "public interest" standard, the commission held that the limited studies conducted by the applicant were sufficient, thereby holding, in effect, that it was entirely permissible for the developer to disregard the determinations that the Fish and Wildlife Service had made.

Overall, there are at least two lessons to be learned here.

First, wind energy developers are not going to voluntarily take all the steps that are reasonably necessary for the protection of wildlife. They just aren't going to do it. These developers are for-profit corporations that, like any other, are answerable to shareholders. Their basic imperative will always be to get turbines up and running and thereby generating some amount of electricity, not much, by the way, and more importantly for their owners major tax credits.

In the same vein, after the 2003 and 2004 studies on bat mortality at the Mountaineer site, the project owner refused to allow further studies there, and it has likewise refused to alter its operations in a way that could reduce bat mortality.

Second, the state permitting agencies cannot be counted upon to implement the Federal wildlife protection laws. It is noteworthy that in disregarding the determinations of the Fish and Wildlife Service had made on the proposed Beach Ridge project, the West Virginia Public Service Commission relied heavily on the point that those determinations were made under guidelines that are voluntary and interim in nature.

In sum, if the Federal wildlife laws are to be fully implemented with regard to wind energy projects, the job must be done by the Fish and Wildlife Service. The action of the Service in issuing guidelines on wind turbine impacts on wildlife was certainly appropriate because it is far better to avoid harm to wildlife in the first place rather than to address it after the fact.

But one point that needs to be looked at is the effect of the voluntary nature of the guidelines when combined with the fact that no wind energy company has yet been prosecuted for violating the Federal wildlife laws. One question that is raised is whether these circumstances are tending to create a situation in which the wind

energy companies are enjoying a de facto exemption from the wildlife protection laws.

More broadly, the problem of the impacts of wind turbines on wildlife needs to be confronted squarely. It needs to be confronted honestly. One basic question that needs to be answered is, if developers are allowed to carry out their plans to build thousands of turbines on the Appalachian mountain ridges, what are the specific impacts on wildlife, and on our ecosystem, what will result?

It is simply a matter of sound public policy that we know the answer to these questions before construction takes place. Once we have that information, we will be in a position to make the informed decisions on where wind energy projects should be built, and under what terms and what conditions.

This hearing is an important first step in this process. I look forward to your continuing efforts. I compliment you for having this hearing, for being insightful enough to look beyond our rush to implement alternative ways of generating electricity, to look for the impacts prior to us being left with legacies that are unfortunate and costly in the long run, and is all you have to look at the energy-producing areas of the country to know that we have been playing catch-up because we did not anticipate the consequences of bad policy, and going forward without consideration of the impacts of the energy production that we have had in the past, and we want to anticipate it into the future.

So I compliment you, Madam Chairman, and thank you for allowing me so much time to testify. I would be pleased to answer questions.

[The prepared statement of Mr. Mollohan follows:]

**Statement of The Honorable Alan B. Mollohan, a Representative in
Congress from the State of West Virginia**

Madam Chairwoman, I want to commend the subcommittee for holding what I believe is the first congressional hearing on the impacts of wind turbines on wildlife, and I am grateful for the opportunity to appear before you.

Wind-energy developers have targeted the mountain ridges of my state of West Virginia, and for a number of years I've expressed my deep concern about their projects. Among the reasons for my concern are the environmental impacts of these massive projects, including their impacts on the natural beauty of my state, and their impacts on wildlife. In the past, West Virginia's natural resources were exploited without regard to the long-term environmental consequences, and I think it's imperative that this not be allowed to happen again.

For anyone who's ever seen an industrial wind-energy project on mountain ridges, it isn't at all surprising that they raise serious environmental concerns. For example, the Mountaineer project, which is in my district, consists of 44 turbines, each of which is about 340-feet high—in other words, 50 feet higher than the tip of the Capitol dome—and those turbines are spread out over 4,000 acres of mountain ridges.

This hearing could not be more timely. With last year's extension of the federal tax subsidy for wind-energy production, and with the concern over global warming, more attention is being paid to wind energy now than ever before.

But at the same time, there is mounting evidence that in at least some regions of the country—including the mid-Atlantic region—and in some circumstances, wind turbines have a devastating impact on wildlife. It is especially troubling that the reasons for this impact are largely unknown, and so real solutions to these problems simply are not in sight. Compounding these problems is the fact that critical information on the bird and bat populations, such as information on their size and migratory pathways, simply does not now exist.

In short, there is little reason to believe that the wind-energy projects that are being built in environmentally sensitive areas will be any less deadly to wildlife

than those built in the past. The cumulative impact of all of these projects on wildlife has to be of concern to Congress for at least two reasons.

First, all wind-energy projects—those that are destructive of wildlife, as well as those that are not—are federally subsidized through the Production Tax Credit. Almost certainly those projects would not exist but for that subsidy, and so Congress has a real responsibility to address this issue.

Second, the federal wildlife protection laws are intended to prevent this kind of harm from occurring, and so it's also important for Congress to closely examine whether wind-energy developers are complying with those statutes, and whether any changes in the law are warranted.

To that end, I'd like to devote the remainder of my statement to what's occurred in West Virginia regarding the construction and operation of wind-energy projects. Because it's clear that West Virginia is an environmentally sensitive area, one would think that both developers and the state permitting agency—which is the West Virginia Public Service Commission—would adopt a cautious approach to large, new projects. Unfortunately, that is not the case.

Currently there is one wind-energy project operating in the state, the 44-turbine Mountaineer project that I referred to earlier. It was the Mountaineer project that, according to studies conducted in 2003 and 2004, killed thousands of bats during the study periods, resulting in estimates of mortality that, according to the Fish and Wildlife Service, “are among the highest ever reported in the world.”

The Public Service Commission has approved the construction of three additional, much larger projects in the state—most recently, in August of last year, a 124-turbine project. Two weeks ago the Commission began hearings on yet another proposed project.

If these four projects are built as proposed, the number of turbines on the mountain ridges of West Virginia would jump by well more than 10-fold, to 584 turbines. If those data weren't sobering enough, the Fish and Wildlife Service stated recently that it is reviewing six more wind-energy projects that have been proposed for the state.

The facts relating to the project that was approved last August, the “Beech Ridge” wind-energy project, are particularly disturbing. That project was approved even though the developer's own environmental consultant predicted that the project would kill nearly 7,000 bats annually, and thus would result in the same or greater mortality than had been recorded at the Mountaineer project.

Moreover, after carefully reviewing the plans for the Beech Ridge project, the Fish and Wildlife Service determined that before beginning construction, the developer should conduct specific, multi-year studies on the impacts that the project would have on birds and bats. But the developer rejected the agency's conclusions and instead conducted studies that were far more limited.

Even though the Public Service Commission decides applications under a “public interest” standard, the Commission held that the limited studies conducted by the applicant were sufficient—thereby holding, in effect, that it was entirely permissible for the developer to disregard the determinations that the Fish and Wildlife Service had made.

Overall, there are at least two lessons to be learned here.

First, wind-energy developers are not going to voluntarily take all the steps that are reasonably necessary for the protection of wildlife. These developers are for-profit corporations that, like any other, are answerable to their shareholders. Their basic imperative will always be to get turbines up and running, and thereby generating some amount of electricity and—more importantly for their owners—major tax credits. In the same vein, after the 2003 and 2004 studies on bat mortality at the Mountaineer site, the project owner refused to allow further studies there, and it has likewise refused to alter its operations in a way that could reduce bat mortality.

Second, the state permitting agencies cannot be counted upon to implement the federal wildlife protection laws. It is noteworthy that in disregarding the determinations that the Fish and Wildlife Service had made on the proposed Beech Ridge project, the Public Service Commission relied heavily on the point that those determinations were made under guidelines that are voluntary and interim in nature.

In sum, if the federal wildlife laws are to be fully implemented with regard to wind-energy projects, the job must be done by the Fish and Wildlife Service. The action of the Service in issuing guidelines on wind-turbine impacts on wildlife was certainly appropriate, because it is far better to avoid harm to wildlife in the first place rather than address it after the fact.

But one point that needs to be looked at is the effect of the voluntary nature of the guidelines when combined with the fact that no wind-energy company has yet been prosecuted for violating the federal wildlife laws. One question that is raised is whether these circumstances are tending to create a situation in which the wind-

energy companies are enjoying a de facto exemption from the wildlife protection laws.

More broadly, the problem of the impacts of wind turbines on wildlife needs to be confronted squarely and honestly. One basic question that needs to be answered is, if developers are allowed to carry out their plans to build thousands of turbines on Appalachian mountain ridges, what are the specific impacts on wildlife, and on our ecosystem, that will result?

It is simply a matter of sound public policy that we know the answer to this question before that construction takes place. Once we have that information, we will be in a position to make informed decisions on where wind-energy projects should be built, and under what terms and conditions.

This hearing is an important first step in this process, and I look forward to your continuing efforts. I would be glad to answer any questions that you may have.

NOTE: Additional information submitted for the record by Mr. Mollohan has been retained in the Committee's official files.

Ms. BORDALLO. I thank my colleague, the gentleman from West Virginia, Mr. Mollohan, for his testimony, and I ask unanimous consent that we enter into the record the supporting materials for the testimony of Congressman Alan B. Mollohan.

Hearing no objection, so ordered.

Mr. MOLLOHAN. Thank you, Madam.

Ms. BORDALLO. Would any of the members wish to ask questions? Mr. Rahall, we will begin with you to ask a question of your colleague?

Mr. RAHALL. Well, thank you, Madam Chair. I don't have any questions really except to highlight a point that my colleague raised, and that is the tax credits that these corporations seem to be enjoying both on the Federal and state level, and it appears to be reminiscent of the controversy we had in the synfuels industry when that industry came into West Virginia, applied some kerosene to coal or something they claimed was new, and use it as a spray, and got tax credits for what was really nothing new, and ended up being bogus.

At that time it was a Marriott corporation, as I recall, that was getting these tax credits from the state or Federal—I am not sure who.

So here, it appears very much the same type of scenario. These out-of-state, sometimes foreign-owned corporations are coming in and saying they have this new pollutant abatement technology, or whatever they are describing it as, in order to get tax credits, and it seems to be just a mere write-off of other energy concerns they may have where they are making profits and trying to offset one from the other.

So I think we need to certainly take a serious look at the tax credits of these out-of-state corporations maybe enjoying at our expense.

Mr. MOLLOHAN. I think I agree totally. I think obviously because the Federal tax advantages for developing and implementing wind energy, one of the most important purposes and interests of the Federal government obviously is to look at the tax subsidy issue.

I think a cost/benefit study would really be interesting here, or a cost/benefit look. What is the cost of wind energy in terms of revenues lost to the Federal government, revenues lost to the State of West Virginia?

We are really subsidizing an industry which is contributing on the benefit side extremely little to the electric grid across the

country. You would have to put windmills on every single ridge in West Virginia to increase the percentage of contribution that energy generated by windmills would increase, and I believe it is below 1 percent. I am sorry I don't have the number in my head, but it is well below 1 percent. You wouldn't get it up to 1 percent. Then the question is what damage have you done? What would be the cost not only in subsidies but in the cost of energy to wildlife, and to the viewshed?

There is a huge environmental viewshed issue here, and I am not against windmills at all. There are probably places in the country that windmills are perfectly appropriate from every standpoint, from the standpoint of not impacting wildlife in an unacceptable way, and from a standpoint of not obstructing the viewshed, but there are special areas that are viewshed-sensitive, and mountain ridges, these windmills totally redefine the mountain ridges.

You do not see trees. You see windmills, and I suspect that is true in any silhouette kind of environmental area. I can imagine the oceans, it would be close in. It would be a very objectionable thing. So the viewshed issue is a competing environmental issue in my mind, and obviously the killing of bats and birds.

While some of these bats—I am sorry to go on here—but some of these bats, these bats were not endangered species, but at the rate they are being killed by these windmills they may become endangered species in West Virginia.

Mr. RAHALL. Thank you, Alan. Thank you for your superb testimony.

Mr. MOLLOHAN. Thank you.

Mr. RAHALL. Thank you, Madam Chair.

Ms. BORDALLO. Thank you. The Chair now recognizes the Ranking Member, Mr. Sali, of Idaho.

Mr. SALI. Thank you, Madam Chair.

Congressman Mollohan, I am trying to figure out exactly what changes to Federal policy, Federal law that you might be advocating, and let me ask you some specifics.

Are you proposing that the Federal government assume some kind of responsibility in siting wind turbine farms?

Mr. MOLLOHAN. I am definitely proposing that the Federal government develop, after careful hearings and careful studying, there is a National Academy of Science study going on right now with regard to siting, siting standards, absolutely. I think it could be a model like the surface mining legislation, which addresses after the fact a very unfortunate environmental degradation with surface mining.

The Federal government can pass the standards and the states can achieve compliance with the Federal standard and gain primacy or have stronger standards, but the Federal government is definitely in the position, and certainly because of its subsidy is giving to windmills, has an interest in providing leadership in all the environmental areas, including the siting areas.

Mr. SALI. You are advocating that the Federal government take a status of preemption in the siting?

Mr. MOLLOHAN. Well, what I just said was that the Federal government provide leadership, much in the model that is available for us with regard to surface mining legislation. Is the Federal

government is in the best position and has an interest—I am repeating myself because certainly because of its subsidy interest, but it is the subsidy that it provides to his industry, but also because these issues are national in scope, and just like any other environmental control, if you apply the control nationally, then you create a level playing field for the cost.

So, yes, I think it would be good policy for the Federal government to come up with siting standards which, I think, the states could achieve primacy with regard to by adopting those standards equally or stronger standards.

Mr. SALI. OK.

Mr. MOLLOHAN. But the Federal government is in the position to provide leadership, and can you imagine how it would happen otherwise in 50 states?

Mr. SALI. Well, apparently that is what we are doing today, and that is what you don't like, and that is what I am trying to figure out.

Mr. MOLLOHAN. No, no, no. That is what I am advocating. That is what I am saying. Can you imagine how it would happen otherwise in 50 states?

If we have a here and now energy crisis issue, then we have a here and now how are we going to do it right with regard to each of the alternative industries, the renewable industries that we are going to bring forward.

But with regard to this windmill, the industrial windmill industry, there are virtually no standards. Why would we do that? Why would we repeat the experience that we have had with regard to coal mining, with regard to oil production, with regard to oil and gas, and allow this industry to go forward without in a prospective way looking at the environmental harms and the wildlife harms? Why don't we do that?

Be wise about it at this point based upon our experience of not being wise in the past, and anticipate these degradations and fashion policy to allow the industry to go forward, but to allow it to go forward only in an environmentally acceptable way, and siting is certainly one issue, and killing wildlife is certainly another issue?

Mr. SALI. OK, let us talk about that second piece there, the wildlife part.

Mr. MOLLOHAN. Yes.

Mr. SALI. I think I am correct that bats are not migratory birds so we wouldn't regulate them under the Migratory Bird Treaty Act.

Mr. MOLLOHAN. Well, you can regulate them under anything you want because this is the Federal government and you are in the business of fashioning authorization laws, and if bats are endangered, as they are particularly in these sensitive areas, then the Federal government needs to look at that, and I would recommend come up with standards with regard to it if it is found that bats are killed in unacceptable numbers.

Mr. SALI. So you are advocating that we add bats to the Migratory Bird Treaty Act?

Mr. MOLLOHAN. No. I am advocating that you look at the issue as you are doing, and I compliment you for doing that in this hearing. When you make a determination, number one, if there is a harm that should be protected against by the Federal government,

and then you look at, as an authorizer, the appropriate vehicle to provide that protection.

Mr. SALI. Congressman, I am not trying to turn this into a debate. I am just trying to figure out—

Mr. MOLLOHAN. I am not debating. I am answering your question. I am telling you that I think you ought to address it. I am not saying yes to your question, but I am telling you where I think they should do it. I think you should look at it, and I think you should address the issue appropriately. I am just saying, I am over here, as Nick Rahall says, on the appropriate side. You are on the thinking side. You are over here really fashioning this policy, and so I compliment you for—

Mr. SALI. I am glad to know that you agree that—

Mr. MOLLOHAN. I am complimenting you for being able to look at the right place to address this issue.

Mr. SALI. I am just trying to figure out what areas of the law you would like us to change.

Mr. MOLLOHAN. I want you to change the area of the law that you think is appropriate to change, and I think you are in a better position to determine—

Mr. SALI. But I am asking you which ones you are advocating for us to change. You have more level of knowledge than—higher level of knowledge than I do about the specifics of this. That is why you are testifying.

Mr. MOLLOHAN. I don't.

Mr. SALI. Are you advocating that we change the Migratory Bird Treaty Act? Yes or no.

Mr. MOLLOHAN. I am advocating that you change or create an appropriate legislative vehicle to address this unacceptable kill of bats and birds that aren't migratory and that are being killed at a rate that they may become an endangered species.

Mr. SALI. All right. Thank you.

Mr. MOLLOHAN. Thank you.

Ms. BORDALLO. Thank you. Thank you, Ranking Member.

Now I would like to recognize Mr. Kildee from Michigan.

Mr. KILDEE. Thank you, Madam Chair.

Alan, years ago in the northwest of this country dams were being built and we found out later the effect it had upon the salmon population, in some instances almost ruined for certain rivers and further inland, even as far as Idaho salmon, and we didn't know what we were doing then. We didn't ask ourselves what would happen to the salmon.

I think what you are doing early on, because this is still fairly early, to try to ask ourselves what will the effect on birds and bats be, and I think we commend you, I commend you for asking those questions that were not asked about the salmon years ago when those dams were being built, and some are being unbuilt now because of that.

What can we do, first of all, to mitigate the harm to the birds and the bats, and when we do destroy or minimize one species, do we make it easier for other species to move in, and invasive species move in and have a negative effect upon that area?

Mr. MOLLOHAN. First of all, may I compliment you, which I hadn't thought of, on the salmon analogy. That is a very

interesting analogy. And going back to my notion about doing a cost/benefit study, we are now in a remedial way spending hundreds of millions of dollars to ensure that the salmon, various salmon populations are not devastated or that we can restore them, and that is the one contribution the subcommittee that I chair makes annually, and the funding for salmon restorations in the hundreds of millions of dollars, and we every year increase the president's request in that regard, and we have tremendous member interest in that.

We are also—in that cost/benefit study, we should look at things like how much does it cost us to restore the land after surface mining, or rivers and streams after underground mining, and so we fully appreciate, and we should do it in a prospective way, fully appreciate all of the harms that windmills can possibly result in that will leave us with these unacceptable legacies that are very expensive.

When you put in a windmill, I didn't testify about this, but when you put in a windmill, you essentially clear-cut the mountain ridge, clear-cut the mountain ridge. That is what you do, and these are industrial sites all along the mountain ridge, and it does absolutely redefine the mountain ridge, and then, as I testified, it has these negative but only imperfectly documented wildlife losses, and as I pointed out, this study is totally inadequate in order for us to really fashion good policy. We have some studies coming.

The second part of your question probably is outside my area of expertise. It is beyond my area of expertise, and I am sure there may be some fish and wildlife people here that can address specifically.

Mr. KILDEE. If I could amend that question a bit. I wish there had been Alan Mollohan around at the time we were building those dams, or trying now to reverse some of that because those questions should have been asked at that time.

I mentioned invasive species, what effect it might have, but even maybe the species that are there that are being kept, their population kept low with the absence of bats, for example. The species may grow and have a negative effect upon the land.

Mr. MOLLOHAN. I have read, and only based upon that and not my own expertise, bats are voracious consumers of bugs, and so what is the impact of devastating the bat population with regard to mosquitoes, with regard to all kinds of—

Mr. KILDEE. Beetles, the things that sometime attack our forests, right?

Mr. MOLLOHAN. Perhaps. I don't know if beetles are a part of their food chain, but there are lots of—I am sure these smart gentlemen behind me, and ladies, can testify to there are all kinds of harmful insects.

This is a lot of killing of bats—just the studies they did. It is really unacceptable because if they are not endangered at the rate they are being killed there are some judgments by experts that they could become endangered, and so why do that? Why not understand that impact before it happens so that we can fashion a policy, have windmills, but do it in the right way?

Mr. KILDEE. Well, I commend you for what you are doing because the forest industry in Michigan is being restored. Back around the

turn of the century my dad was a lumberjack, went to work in the lumber woods, and when he was 13 years old, and he can recall when they brought the last load of virgin timber from the lower peninsula into Traverse City, Michigan. But now we are trying to restore it, and one of the threats to the forest industry, of course, are various types of insects, and the bats might have some role in trying to keep that population under control.

Mr. MOLLOHAN. Well, that has a huge role in keeping insect population down. That I do know.

Mr. KILDEE. We don't really know, but I think you are asking the right questions. You are raising that. I wish someone had done this for the salmon years ago, and they were just being built but no one ever asked these questions, so I commend you for what you are doing.

Mr. MOLLOHAN. Mr. Sali asked the question about is it appropriate in the first instance for the Federal government to address this issue legislatively. Well, look at it and see what they should do legislatively, and my answer was yes.

I would just add to that, that the West Virginia Legislature has not done that, and I am not sure that any state has done that, and these issues can easily sneak up on you, and become real problems before certainly state legislatures take them up, and commend you for taking leadership by holding this hearing, and perhaps the Federal government should really step forward with the leadership.

Mr. KILDEE. Perhaps we can find a way where we can have both the wind-generated power and protect the environment.

Mr. MOLLOHAN. Oh, no doubt.

Mr. KILDEE. Right. And I think you are helping us.

Mr. MOLLOHAN. I am not here testifying against wind power.

Mr. KILDEE. Right.

Mr. MOLLOHAN. I am here testifying for us taking into consideration the consequences of the industry in different locations, and having us understand ahead of time what we are doing and fashion policy to make sure we do it right.

Mr. KILDEE. How we can mitigate damage and maybe still have the wind power, but mitigate the damage that it might—

Mr. MOLLOHAN. I am sure there are lots of places that wind power is appropriate and doesn't have these unfortunate consequences.

Mr. KILDEE. Thank you very much for what you are doing. Thank you.

Mr. MOLLOHAN. Thank you, Mr. Kildee.

Ms. BORDALLO. I thank my colleague from Michigan, Mr. Kildee, and our witness this morning. I thank you very much, Mr. Mollohan, for coming before us, and answering our many questions that we had, and I also wish to thank our overall Chairman of the Resources Committee, Mr. Rahall, for appearing before this hearing. You can be excused.

Mr. MOLLOHAN. In turn, I would like to thank you again for holding the hearing and allowing me to testify. I would like to thank my good friend, Congressman Rahall, for being here, and then I would like to invite you all to the only site in West Virginia right now, as I say there is going to be five more real quickly and a bunch of others, to come over and view them.

It is in Tucker County, in the Canaan Valley. It is the 500th wildlife refuge in the country. In the wintertime, there is good skiing. In the summertime, there is all kinds of good hiking and fishing, there is even a golf course for those who can't put their clubs away.

Thank you very much.

Ms. BORDALLO. Thank you very much. That sounds like an interesting invitation, and—

Mr. MOLLOHAN. Just three hours away.

Ms. BORDALLO.—we will take that under advisement. Thank you.

Mr. MOLLOHAN. Thank you. Thank you, Madam Chairman.

Ms. BORDALLO. As Chairwoman, I now recognize our second panel of witnesses, and our witnesses on this panel include Mr. Dale Hall, the Director of the U.S. Fish and Wildlife Service; Mr. Edward B. Arnett, Conservation Scientist, Bat Conservation International; Dr. Michael Fry, Director, Birds and Pesticides, American Bird Conservancy; Mr. Eric R. Glitzenstein, attorney and partner, the law firm of Meyer Glitzenstein and Crystal; and Mr. Michael Daulton, Director of Conservation Policy, the National Audubon Society.

I now recognize Mr. Hall to testify for five minutes. I would note for all witnesses that the red timing light on the table will indicate when your time has concluded, and we would appreciate your cooperation in complying with the limits that have been set as we have several witnesses to hear from today, and be assured that your full statement will be submitted for the hearing record.

Mr. Hall.

**STATEMENT OF DALE HALL, DIRECTOR,
U.S. FISH AND WILDLIFE SERVICE**

Mr. HALL. Good morning, Madam Chairman, Members of the Subcommittee.

I appreciate the opportunity to testify before you today regarding wind energy development and its impacts to wildlife resources. Wind-generated electrical energy is clean energy. It is renewable and produces no emissions. However, at this point we cannot say that wind energy is always green energy. Wind energy facilities can adversely impact wildlife, especially birds and bats, and their habitats.

Commercial wind energy facilities have been constructed in 34 states, with developments planned for several other states as well as offshore areas and locations along all coasts, including the Great Lakes. As more facilities with larger turbines are built, the cumulative impacts of this rapidly growing industry may initiate or contribute to the decline of some wildlife populations and may seriously degrade wildlife habitats.

Wind energy continues to grow exponentially with slightly more than 16,000 commercial wind turbines currently operating in the United States, and within the next 12 years it is predicted that that will grow to more than 155,000, almost 10-fold increase.

Potential harm to wildlife populations from direct mortality and from habitat disturbance and fragmentation makes careful analysis today very important. The impacts of wind power facilities on energy vary by region and by species. Studies show that wind

power facilities in central California, Pennsylvania, West Virginia, have killed large numbers of raptures and bats.

However, many wind power facilities in the United States have not been studied. Also, much is still unknown about bird migratory pathways and corridors and overall species population levels. As a result, scientists cannot draw definitive conclusions about the threat and cumulative impacts that wind power poses to wildlife.

In addition to impacts to birds and bats due to the air strikes, the Service is concerned about the cumulative impacts of wind power to terrestrial fauna. New wind power development will require not only construction of wind turbines but also extensive construction of related infrastructure, access roads, and transmission corridors. Because much of the supporting infrastructure will be constructed in areas that are currently completely undeveloped, the effects of habitat fragmentation will likely impact terrestrial species.

Regulating wind power facilities is largely the responsibility of state and local governments. However, regulatory agency officials do not always have experience or expertise to address environmental and wildlife impacts from wind power.

The Federal government generally only has a regulatory role in wind power development when development occurs on Federal lands or involves some form of Federal participation such as providing funding for the projects. In these cases, the development operation of wind power facility must comply with any state and/or local laws as well as Federal laws such as the National Environmental Policy Act and the Endangered Species Act, which often require pre-construction studies or analyses and possible modifications to proposed projects to avoid adverse environmental effects.

The Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, the Endangered Species Act, and the Marine Mammal Protection Act are the Federal laws most relevant to protecting wildlife from wind power impacts, and these laws generally forbid harm to various species of wildlife.

Although none of the four laws expressly require wind power developers and operators to take specific steps to ensure that wildlife will not be harmed during either the construction or operation of their facilities, wind power developers or operators are liable for any harm to protected species that may occur. In 2003, the Service announced the availability of voluntary interim guidelines that have provided and continue to provide a national template for use by Federal, state, and local governments in the wind power industry, to use in siting and evaluating wind power development proposals in environmentally friendly ways.

On March 13, 2007, we announced in the Federal Register the establishment of a Wind Turbine Guidelines Advisory Committee. This committee will provide advice and recommendations to the Service and the Secretary on effective measures to avoid or minimize impacts to land-based wind energy facilities. Nominations for members closed on April 12, and we expect to have approximately a 20-member task force that will work with us over the next two years.

The key points that we need to be evaluating, I believe, are, number one, the pre-construction site evaluation and biological

needs in order to know what the impacts may be, and then the monitoring and proper siting of the facilities that comply with the best environmentally friendly aspects of siting facilities.

With that, I see my time is up, and I look forward to answering any questions.

[The prepared statement of Mr. Hall follows:]

**Statement of H. Dale Hall, Director,
Fish and Wildlife Service, U.S. Department of the Interior**

Madam Chairwoman and Members of the Subcommittee, thank you for the opportunity to provide the testimony of the Department of the Interior and the U.S. Fish and Wildlife Service on wind energy development and impacts to fish and wildlife resources. I am Dale Hall, Director of the U.S. Fish and Wildlife Service (Service).

Introduction

Wind-generated electrical energy is renewable, produces no emissions, and is considered to be generally environmentally-friendly technology. The President's National Energy Policy seeks, among other things, to stimulate development of alternative energy sources, including wind, and to explore the use of these new technologies along with energy conservation practices. The Department, through the Bureau of Land Management and the Minerals Management Service, is working to implement this policy by providing greater opportunities for the development of alternative energy, including wind energy.

As discussed in more detail below, while there are clear benefits to wind energy development, some facilities, particularly older facilities or those sited in areas with a high presence of birds and bats have the potential to cause deaths due to collisions, with unspecified long-term results. With this in mind, the Service is focusing its efforts on determining ways to balance wildlife needs when wind energy facilities are sited and constructed. My testimony does not address the benefits of wind power, nor does it compare the impacts of wind with those of other generation technologies, including traditional fossil fueled generation.

In addition to wildlife studies from both Europe and North America, the recent Government Accountability Office (GAO) report that addressed these issues, and the laws and regulations currently in place to manage wildlife impacts from wind energy development, I will discuss positive actions taken by the Service to assist industry in minimizing impacts to wildlife when constructing wind energy facilities. These positive steps include publication of interim guidelines relating to siting and evaluating wind power development proposals and establishment of the Wind Turbine Guidelines Advisory Committee to provide advice and recommendations to the Secretary of the Interior on development of measures to avoid or minimize impacts from land-based facilities to wildlife and habitat.

Overview of Wind Energy Development

Commercial wind energy facilities have been constructed in 34 states, with developments planned for several other states, as well as offshore areas and locations along all coasts, including the Great Lakes. As more facilities with larger turbines are built, the cumulative impacts of this expanding industry and other energy generation technologies as well should be evaluated. Land-based turbines currently are approaching heights of 450 feet above ground level, while offshore turbines will likely be taller, with rotor swept areas currently covering nearly 3 acres of airspace and blade tip speeds exceeding 170 miles per hour at operating speeds. Wind energy continues to grow, with slightly more than 16,000 commercial wind turbines currently operating in the United States. The President's Advanced Energy Initiative of 2005 notes that wind energy has the potential to provide 20 percent of our national electricity needs, the estimated equivalent of over 300 gigawatts of electricity or over 150,000 commercial turbines nationwide. The potential harm to wildlife populations from direct mortality and from habitat disturbance and fragmentation makes careful evaluation of proposed facilities essential.

As noted in the GAO's September 2005 report, titled "Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife," avian mortality has been well documented at older wind energy facilities in the western United States. Based on this knowledge, the wind industry has made many adjustments to locating facilities and equipment. However, the potential impact of wind energy developments on wildlife and their habitats is within the mission area of the Service. Due to local, seasonal, and annual differences in wildlife concentration and movement patterns, habitats, area topography, facility

design, and weather, each proposed development site is unique and requires an appropriate level of evaluation.

Europe has played a leading role in commercial wind development for at least the past decade, including offshore wind energy siting and operation. Norway, for example, produces nearly 15 percent of its electrical energy by wind, including offshore development. Until recently, detailed analysis of wind energy impacts to birds and bats in Europe—both for land-based and offshore facilities—had not been especially robust. However, recent studies of the impacts of offshore facilities on sea ducks, for example, have shown facility avoidance, behavioral modification, and feeding disturbance of these waterbirds. Detecting birds that have collided with offshore facilities is extremely difficult. The impacts that offshore facilities may have on increased sea duck energy demands, disruptions to feeding, and behavioral modification are only now being assessed.

Service personnel may become involved in the review of potential wind energy developments on public lands or where there is a Federal nexus (i.e., a Federal permit or Federal funding) through the required National Environmental Policy Act review. This may be as a cooperating agency or because of the Service's responsibilities under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, or because of the agency's special expertise. The National Wildlife Refuge System Improvement Act requires that any activity on Refuge lands be determined to be compatible with the Refuge system mission and Refuge purposes. In addition, the Service is required by the Endangered Species Act to assist other Federal agencies in ensuring that any action they authorize, implement, or fund will not jeopardize the continued existence of any federally listed endangered or threatened species or adversely modify its designated critical habitat. Service biologists have also received requests from some industry representatives for consultation on wildlife impacts of proposed wind energy developments on private lands. Proposed offshore wind energy facilities within 3 nautical miles of the coast currently require a permit under Section 10 of the Rivers and Harbors Act, which is administered by the U.S. Army Corps of Engineers. The Service routinely provides Section 10 permit application review and comment. Proposed offshore wind energy facilities in federal waters are regulated by the Minerals Management Service per its authorities under the Energy Policy Act of 2005. Their siting and operations will be subject to National Environmental Policy Act review and Endangered Species Act and Marine Mammal Protection Act requirements.

U.S. Government Accountability Office (GAO) September 2005 Report on Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife

As previously mentioned, the GAO published a study of wind power and its effects on wildlife in 2005. The study did not compare the impacts or benefits of wind with those of other generation technologies, including traditional fossil fueled generation. Many of their summaries and findings, which are summarized here, are relevant to today's discussion.

Habitat destruction and modification is a leading threat to the continued survival of wildlife species in the United States. Although wind power facilities were once thought to have practically no adverse environmental effects, it is now recognized wind energy, like all power generation technologies, can have adverse impacts, particularly on wildlife, and specifically on birds and bats and their habitats. Large numbers of birds and bats have been well documented to cross virtually all parts of the United States, including along mountain ridges, coastlines, and in broad front migrations from the Rocky Mountains to the Atlantic coast during their seasonal migrations. Consequently, wind power projects located in areas with a high presence of birds and bats could potentially impact these animals. For example, at older, first-generation wind power-generating facilities in California's Altamont Pass west of the Bay Area, wind turbines killed large numbers of migratory birds. High levels of bat mortality have been documented at two facilities in Appalachia, as well as at facilities in Oklahoma and southern Alberta, Canada. Wind power facilities may also have other impacts on wildlife through alterations of habitat, disturbance, and behavioral modification.

In this context, GAO assessed (1) what available studies and experts have reported about the impacts of wind power facilities on wildlife in the United States and what can be done to mitigate or prevent such impacts, (2) the roles and responsibilities of government agencies in regulating wind power facilities, and (3) the roles and responsibilities of government agencies in protecting wildlife.

As the GAO report points out, uncertainty and gaps in knowledge have resulted in the inability of scientists to draw definitive conclusions about the threat and cumulative impacts that wind power poses to wildlife. The impacts of wind power

facilities on wildlife vary by region and species. Specifically, studies show that wind power facilities in central California, Pennsylvania, and West Virginia have killed large numbers of raptors and bats. It should also be noted, however, that studies in other parts of the country show comparatively lower levels of bird mortality, although most facilities have killed at least some birds. Many wind power facilities in the United States have yet not been studied, but where studies have been conducted, research efforts are not consistent and the findings may not be valid. Furthermore, much is still unknown about bird migration pathways and corridors and overall species population levels. Notably, only a few studies have been or are being performed concerning ways in which to reduce wildlife fatalities at wind power facilities.

In addition to impacts to birds and bats due to air strikes, the Service is concerned about the cumulative impacts of wind power to terrestrial fauna. New wind power development will require not only construction of wind turbines, but also construction of related infrastructure such as access roads and transmission facilities. The effects of such habitat fragmentation could impact terrestrial species.

Regulating wind power facilities is largely the responsibility of state and local governments. However, there are regulations related to air safety and obstruction evaluation and analysis of wind projects administered by the Department of Transportation's Federal Aviation Administration. In addition, wind projects proposed in Federally-administered offshore waters would be within the purview of the Minerals Management Service, which serves as lead regulatory agency. In the six states that GAO reviewed, wind power facilities are subject to local- or state-level processes, such as zoning ordinances to permit the construction and operation of wind power facilities. As part of this process, some agencies require environmental assessments before construction. However, regulatory agency officials do not always have experience or expertise to address environmental and wildlife impacts from wind power.

As a general rule, the Federal government has a regulatory role in wind power development only when development occurs on Federal land or involves some form of Federal participation, such as providing funding for projects. In these cases, the development and operation of a wind power facility must comply with any state or local laws as well as Federal laws, such as the National Environmental Policy Act and the Endangered Species Act, which often require preconstruction studies or analyses and possibly modifications to proposed projects to avoid adverse environmental effects.

As with any activity, Federal and state laws afford protections to wildlife from wind power facilities. Four laws, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, the Endangered Species Act, and the Marine Mammal Protection Act (for offshore facilities), are the Federal laws most relevant to protecting wildlife from wind power facilities, and these laws generally forbid harm to various species of wildlife. The Service is the Federal agency that has primary responsibility for implementing and enforcing these laws. Although none of the four laws expressly require wind power developers and operators to take specific steps to ensure that wildlife will not be harmed during either the construction or operation of their facilities, wind power developers or operators are arguably liable for any harm to protected species that may occur. In some cases, developers voluntarily consult with the Service—or a state natural resources agency—before they construct a project or they do so as a requirement of a state or local wind power regulatory agency, to identify potential impacts to wildlife. In other cases, Federal involvement may consist of Service law enforcement officials investigating instances of wildlife fatalities at a wind power facility.

Rather than seeking to prosecute wind power facilities companies when mortality events occur, the Service prefers to work with companies to encourage them to take mitigation steps to avoid future harm. The Service has been working with the wind industry to help identify solutions and ensure that wildlife mortality at wind power facilities is minimized. For example, the Service has participated in many industry-sponsored workshops and conferences, issued interim voluntary guidelines for industry to use in developing new projects that are wildlife- and habitat-friendly, and served as a member in a wildlife working group with industry, their consultants, states, other Federal agencies, scientists, and conservationists since 1995.

Regarding state wildlife protections, all of the six states that GAO reviewed have statutes that can be used to protect some wildlife from wind power impacts. However, no states have taken any prosecutorial actions against wind power facilities where wildlife mortalities have occurred.

To encourage potential wildlife impacts to be considered when wind power facilities are permitted, GAO recommended that the Service reach out to state and local regulatory agencies with information on the potential wildlife impacts due to wind power and on the resources available to help make decisions about the siting of

wind power facilities. The Service has taken these recommendations very seriously, having participated in recent meetings with state and local regulatory officials in California, Colorado, Ohio, New Mexico, New York, Pennsylvania, Texas, and Wisconsin. The Service is also a cooperating agency on NEPA documents for two proposed offshore wind power facilities in the Northeast.

2003 Interim Guidelines on Avoiding and Minimizing Wildlife Impacts from Wind Turbines

At the request of the Secretary of the Interior, the Service established a Wind Turbine Siting Working Group in 2002, to develop a set of comprehensive national guidelines for siting and constructing wind energy facilities. On July 10, 2003, the Service published a notice in the Federal Register announcing the availability of the interim Guidelines and requesting comments through July 7, 2005. The Service received 25 comments from a wide range of stakeholders regarding the interim guidelines. After reviewing the comments and evaluating advances in the science behind wind turbine siting and design, the Service determined that a Federal Advisory Committee Act (FACA) advisory group would best balance representation from wind development, wildlife conservation, and government in the process.

Establishment of Wind Turbine Guidelines Advisory Committee

On March 13, 2007, the Service published a notice in the Federal Register, announcing the establishment of the Wind Turbine Guidelines Advisory Committee. This Committee will provide advice and recommendations to the Secretary of the Interior through the Director of the Service on developing effective measures to avoid or minimize impacts to wildlife and their habitats related to land-based wind energy facilities. The Committee will help us examine issues such as site selection and turbine design, scientifically validated mitigation measures, peer-reviewed pre- and post-construction monitoring protocols, and field tested and validated deterrents so that we can develop land-based wind resources while protecting wildlife. The Committee will also make recommendations on how to coordinate review and evaluation of facilities by state, tribal, local, and Federal agencies. The Committee will be established under the Federal Advisory Committee Act and is expected to exist for two years, with its continuation subject to biennial renewal. Nominations of members closed on April 12, 2007, and we are working with the Secretary on recommendations for appointments to the Committee.

Member organizations will be selected to represent the varied interests associated with wind energy development and wind/wildlife interactions, including state, local, and Federal agencies, tribes, non-governmental conservation organizations, and the wind industry and its consultants. Members will be senior representatives of their respective constituent groups with knowledge of: wind energy facility location, design, operation, and transmission requirements; wildlife species and their habitats potentially affected; wildlife survey techniques; applicable laws and regulations; and current research on wind/wildlife interactions.

The Service will review the final recommendations of the Committee, revise its voluntary guidelines to avoid and minimize wildlife impacts from wind turbines, and make the guidelines available for public review and comment prior to making them final. The Service also plans to develop a national template for an avian protection plan for the wind industry, possibly based on recommendations from the FACA Committee, much like what has been developed for the electric utility industry, with the expectation of regional step-down plans that provide for wildlife-friendly wind power.

Bolstering Service Efforts to Address Impacts

The Service believes that the development of consistent, scientifically valid pre- and post-construction monitoring protocols, capable of being stepped down to regional and local levels would be helpful for all energy generation technologies. Results of studies conducted using scientifically valid protocols to assess risk to species and habitats at energy development sites could be published, ideally in refereed scientific journals. The published information could then be used by the energy industry to validate a risk assessment process, make course corrections based on new post-construction findings, adopt mitigation measures, use deterrents where bird and bat mortality is shown to be problematic, and update and further improve the Service's future guidance.

The Service wants to work with the states, public utility commissions, zoning and planning boards, and industry before wind energy and other generation technology plants are permitted and developed. The Service would like the opportunity for our biologists to review pre-construction and risk assessment data/documents prior to project development. Presently, due to issues of confidentiality, much of this information, especially on pre-construction monitoring and potential impacts, is not

available. The Service also seeks cooperation, including site access, to enable monitoring of sites being proposed for energy project development, sites being selected and assessed using pre-construction monitoring protocols, sites being developed, and sites that are operating to assess mortality, changes in bird and bat behavior, and modifications to habitats that negatively impact species. The Service can assist in the environmentally responsible development of all energy generation, including wind energy, if we have access to research and monitoring information. The Service believes we can work effectively with industry to help develop energy projects in the most environmentally friendly way possible.

Conclusion

In closing, Madam Chairwoman, the Service is responsible for conservation of wildlife in the public trust, and will work to ensure that development of energy projects is carried out in a manner that is bird- and bat-friendly and that sound science and adequate environmental assessments are the basis for informed decisionmaking. The Service will continue to work collaboratively with all stakeholders, including the wind industry, to minimize impacts to wildlife and habitats while maximizing opportunities for energy development in the most wildlife- and habitat-friendly way possible.

This concludes my testimony. I appreciate the opportunity to appear today before the Subcommittee, and I would be pleased to answer any questions that you or members of the Subcommittee may have.

Ms. BORDALLO. Thank you, Mr. Hall.

I now recognize Mr. Arnett to testify for five minutes.

**STATEMENT OF EDWARD B. ARNETT, CONSERVATION
SCIENTIST, BAT CONSERVATION INTERNATIONAL**

Mr. ARNETT. Thank you, Madam Chairwoman, and good morning to the Subcommittee members.

My name is Ed Arnett. I am a conservation scientist with Bat Conservation International, but I also am program coordinator for the Bats and Wind Energy Cooperative, which is an alliance of state and Federal agencies, private industry, academic institutions, and non-governmental organization that was initiated in the late fall of 2003, to try to determine and solve problems associated with bat fatalities.

I am here today at your request, and appreciate the invitation to share some information with you about bats and wind energy development. I would also point out that my testimony is provided on behalf of Bat Conservation International and my comments may not necessarily reflect the opinions of all entities associated with our cooperative, which has been working together over the past three years.

I would like to first point out that bats play an essential role in virtually every ecosystem in the world and occupy very unique ecological niches, and it was noted earlier about pest control. Most notably here in North America, they are key nocturnal predators of insects, and studies of Mexican Free Tail Bats in the State of Texas, for example, have demonstrated extraordinary economic benefits of pest control by these particular bats, and that extends to other ecosystems as well.

Unfortunately, little is known about historical and current populations of most species of bats, but currently many are believed by scientists to be in substantial decline for a number of different reasons. We know that bats are being killed at wind facilities worldwide and large numbers have been documented at several of the facilities that have been studied to date.

This has led to the consensus among world's leading experts that although population impacts remain unknown the projected expansion of wind development and levels of fatalities at some facilities suggest that significant cumulative impacts must be considered for some species, and there are projected numbers that are available in my written testimony, and I would be happy to elaborate on those as needed.

These numbers really escalate rapidly also as we consider projecting out over a particular project for 20 years, 25 years, over the duration, and also considering those impacts from a wide perspective across the distribution of any of these species that are being affected. So the potential for cumulative impacts becomes even more obvious, and this is a serious concern for bats because they are long-lived, they have exceptionally low reproductive rates, population growth is slow, and they are slow to recover from population declines.

Furthermore, several colleagues and I believe that bats are in fact attracted to wind turbines, and they are killing prime breeding-age adults which further exacerbates the population impacts.

Leading experts from around the world have reviewed existing information on wind energy impacts, and all agree that our state of knowledge is unsatisfactory. Pre-construction studies are inconsistently implemented across states, ranging from no effort whatsoever to very intensive studies that we have been working on with proactive companies and other agencies, but they are typically short duration, lack clear objectives, and are underfunded.

Post-construction studies vary in duration and intensity, and may be seriously biased due to field sampling biases that are often-times not accounted for.

However, we have learned some things from our existing studies and we have made some recommendations; most notably, the curtailment of operations during predictable periods may in fact provide an opportunity to reduce fatalities, but those experiments have not been implemented and remain untested to date. Thus we see an urgent need for increasing support for comprehensive interdisciplinary research programs that address priority needs to quantify risks and document the success of potential solutions.

In regard to legislative actions, we believe that perhaps most importantly involves additional funding support at two broad levels. First, agency support for environmental review, permitting, and oversight, and research initiatives to quantify impacts and develop solutions.

It is our opinion that the Federal agencies such as the U.S. Fish and Wildlife Service, land management agencies such as the BLM and Forest Service are grossly understaffed and underfunded to effectively handle the onslaught of permits of wind development on both public and private lands, and they are currently facing budget constraints and staffing issue, and this situation creates potential threats not only for wildlife but also costly delays to the industry, and streamlining and eliminating processes are unacceptable in our view, and both state and Federal agencies need support adequate to participate.

Second, we feel additional funding support for research initiatives is imperative to not only agencies but also to entities such as

the National Science Foundation, the National Fish and Wildlife Foundation and other entities to support this much needed research.

Finally, realizing that it is not the charge of this Subcommittee, Congress could potentially strengthen the Federal tax production credit by requiring when projects to meet standards, including best management practices and guidelines that are in fact developed by the Federal government and other stakeholders to protect wildlife, which would level the playing field and provide equal consideration for wildlife among projects throughout their duration.

In conclusion, Bat Conservation International wants to recognize that we understand threats to the environment and the economy from global climate change, and support the development of clean renewable energy sources. Nevertheless, current evidence has led to the consensus among leading experts that impacts can become severe if facilities continue to operate without careful planning and developing solutions to minimize harm to both birds and bats, which are both ecologically essential.

The Federal government must increase efforts to support the responsible development of wind while protecting wildlife resources. Cooperation access to study sites, funding, and transparency of information from industry has been mixed, but generally we have been pleased—and sometimes frustrated—with the progress of efforts, but our partnerships for the bats and wind energy cooperative and other cooperatives that have been ongoing have been successful to some degree, and we are moving forward and in the right direction, and applaud the companies and organizations working proactively with us to move forward in solving this problem.

Unfortunately, more needs to be done. We need to expand our breadth of cooperation to develop a sound scientific basis for decision-making.

Madam Chairwoman and Members of the Subcommittee, on behalf of BCI I would like to thank you for inviting me and sharing this information. I look forward to helping you with this issue and answering any questions you may have.

[The prepared statement of Mr. Arnett follows:]

**Statement of Edward B. Arnett, Conservation Scientist,
Bat Conservation International**

Introduction

Madam Chairwoman and Members of the Subcommittee, my name is Ed Arnett, Conservation Scientist and Co-Director of Programs for Bat Conservation International (BCI). I am also the program coordinator for the Bats and Wind Energy Cooperative (herein referred to as “the Cooperative”) an alliance of state and federal agencies, private industry, academic institutions, and non-governmental organizations interested in cooperating to develop solutions to minimize or, where possible, prevent mortality of bats at wind facilities. The Cooperative was initiated by BCI, U.S. Fish and Wildlife Service (USFWS), the American Wind Energy Association (AWEA), and the Department of Energy’s National Renewable Energy Laboratory (NREL) and is supported financially by these entities and a diversity of stakeholders including wind industry companies, clean state energy funds, and private individuals and foundations. The Cooperative seeks to secure and administer cooperative funding among interested parties and allocate those resources to promote research needed to address issues and develop solutions surrounding wind energy development and fatality of bats. I studied bat presence and habitat relationships in Oregon for eight years while serving as a research biologist for Weyerhaeuser Timber Company and for my Ph.D. dissertation research. I have led research efforts for the Cooperative since May 2004, which includes post-construction fatality searches at the

Mountaineer, West Virginia and Meyersdale, Pennsylvania facilities, pre-construction assessments of bat activity at multiple sites in Massachusetts, Pennsylvania, and Wisconsin, and investigations on possible acoustic deterrent devices that may reduce fatality of bats at wind facilities. I currently am Chair of a technical review committee on wind energy impacts on wildlife for The Wildlife Society (final report due for public release by early summer 2007), serve as a committee member for the Wind and Wildlife Subcommittee for the Association of Fish and Wildlife Agencies, and provide technical input on bats and wind energy issues to several agencies, organizations, and private industry.

I am here at your request and appreciate the invitation to discuss impacts of wind energy development on bats and address questions from the Subcommittee. In my invitation, I was asked to address four topics and, after providing background information, I will focus most of my comments on these specific areas. My testimony is provided on behalf of BCI and my comments may not necessarily reflect the opinions of all entities associated with the Cooperative.

Background

Fatalities of bats have been recorded at wind facilities worldwide, first noted in Australia in 1972 by Hall and Richards (1972). Before 2001, relatively small numbers of bat fatalities were reported at wind energy facilities in the U.S. (Johnson 2005). These were first noted at facilities in California during avian fatality searches (e.g., Orloff and Flannery 1992). However, bat kills at wind facilities generally received little attention in North America until 2003 when between 1,400 and 4,000 bats were estimated to have been killed at the Mountaineer Wind Energy Center in West Virginia (Kerns and Kerlinger 2004). During that same year, a high kill rate of bats also was discovered at Buffalo Mountain in Tennessee in 2003 (Fiedler 2004).

Shortly after the reports from Mountaineer and Buffalo Mountain in 2003, representatives from the AWEA, BCI, NREL, and the USFWS met in late 2003 and established the Cooperative to further understand causes of bat fatalities at wind facilities and work toward developing solutions. A two-day workshop was held in February 2004 that brought together leading experts on bat ecology, radar and thermal imaging technology, and avian acoustical monitoring from the United States, Canada, and the United Kingdom. Experts concluded that causes and solutions would be extremely difficult to identify without more reliable information about 1) bat migration; 2) bat interactions with turbines, particularly their responses to moving versus non-moving blades and how they are being killed; 3) patterns of fatality in relation to location, topography, weather, and turbine characteristics; and 4) potential deterrents and/or avoidance mechanisms. Based on the recommendations of its experts, the Cooperative undertook field research during the summer of 2004 to improve carcass search protocols and observe bat interactions with turbines. The Cooperative also has conducted extensive pre-construction assessments of bat activity at multiple sites in Massachusetts, Pennsylvania, and Wisconsin, and initiated investigations on possible acoustic deterrent devices that may reduce fatality of bats at wind facilities.

Since the inception of the Cooperative, we have learned that high bat fatality continued at the Mountaineer facility in 2004 (Arnett 2005) and that this site was not an isolated incident in the eastern U.S.; large kills also were reported at facilities in Pennsylvania in 2004 (Arnett 2005) and high fatality rates have continued at the Buffalo Mountain facility in Tennessee (J. Fiedler, Tennessee Valley Authority, personal communication). Colleagues in Europe also have reported widespread bat fatality at wind facilities, especially in Germany (Dürr and Bach 2004, Brinkman 2006), and, most recently, much higher than expected bat fatalities were discovered in mixed forest and agricultural lands in New York (Jain et al. 2007) and in open prairie in southern Alberta Canada (Robert Barclay, University of Calgary, unpublished data). Incidental discoveries by ornithologists in Oklahoma indicate that the Mexican free-tailed bat, the most abundant and economically valuable species of the Southwest, also is vulnerable to wind turbine kills (Piorkowski 2006), yet no formal studies have been conducted in this region.

While current estimated fatality rates of bats are highest for sites located on forested ridges (Johnson 2005, Kunz et al. 2007), it is now irrefutable that increased search efforts since the 2003 findings at Mountaineer have documented a more widespread problem than previously believed. These fatalities raise serious concerns about potential impacts on bat populations at a time when many species of bats are known or suspected to be in decline (Pierson 1998, Racey and Entwistle 2003) and extensive planning and development of wind energy is increasing throughout North America (Kunz et al. 2007). Future developments of wind energy facilities, and expected impacts, depend on complex interactions of economic factors, technological

development, regulatory changes, political forces, and other factors that cannot be easily or accurately predicted at this time (Kunz et al. 2007). Current and projected fatality rates should provide an important wakeup call to agencies, developers, and decision makers to support additional monitoring and hypothesis-based research to address a growing concern of national and international importance.

Topics Requested by the Subcommittee

- 1) *What steps are being taken by federal and state governments to ensure that this emerging technology is appropriately sited and monitored to limit or prevent the incidental take of bats, especially T&E species?*

Key Points:

- There currently is little empirical evidence to determine what represents “appropriate siting” of wind facilities for bats. Extensive research in this area is needed immediately.
- Criteria and standards need to be established, determined based on the best available information, for high risk areas for bats (and other wildlife) that can be integrated into siting guidelines among states or regions so these areas can be protected in a consistent manner.
- Although there is a paucity of empirical evidence supporting actions to limit or prevent incidental take of bats, what evidence and recommendations are available (e.g., curtailment of operations during predictable high risk periods) have not been implemented and remain untested.
- Some states are beginning to integrate mitigation measures into permits (e.g., limited curtailment during low wind periods when most bats kills occur), but these measures still have not been tested in the field.
- Bats usually are protected under state laws pertaining to “nongame” animals, but most states do not enforce take of bats. Bats that have been killed most frequently by wind turbines are not protected under federal law.
- There are no consistent guidelines or processes for siting, permitting, or monitoring and little commonality among states, although several states have embarked on developing voluntary guidelines for siting and monitoring wind facilities.
- Numerous steps have been taken to improve working relationships, cooperation, and information exchange that include developing and participating in state and national working groups, research partnerships, and greater involvement in consultation during permitting.

Federal resource and land management agencies, non-governmental organizations, contractors, developers, and utilities have dominated the discussion about wildlife interactions with wind energy facilities. Until recently, state fish and wildlife agencies have not been deeply or proactively involved. This limited participation reflects a variety of factors, including more immediate management priorities, lack of fiscal and human resources, and the limited regulatory authority to apply wildlife considerations to these decisions. These facts notwithstanding, wind energy permitting and regulation in most of the U.S. is primarily the responsibility of state and local governments, and wildlife agencies have served only in an advisory capacity with no regulatory authority. Often times, wildlife agencies are not consulted or their recommendations considered during permitting. This situation is beginning to change, as several states have embarked on developing guidelines for siting and have set up wind working groups to address issues and advise legislators and regulators about the potential impacts and benefits of wind development, including effects on wildlife resources.

Unfortunately, there currently is little commonality from state-to-state regarding permitting or requirements for pre- or post-construction monitoring. While several states have embarked on developing guidelines for siting, consistency and coordination among states is critical and as yet rare. Developing consistent guidelines for siting, monitoring and mitigation strategies among states and federal agencies would assist developers with compliance with relevant laws and regulations and establish standards for conducting site-specific, scientifically sound biological evaluations. Renewable Portfolio Standards should account for wildlife impacts and inclusion of guidelines in the permitting process would further strengthen agency participation and implementation of guidelines. Permits for wind projects should contain language regarding monitoring and mitigation requirements; recently, some states have integrated these requirements into permits (e.g., curtailment for a specified period of time and under certain conditions), although mitigation measures remain untested and some may be inadequate.

Criteria and standards need to be established, determined based on the best available information, for high risk areas for bats (and other wildlife) that can be inte-

grated into siting guidelines among states or regions so these areas can be protected in a consistent manner. An unfortunate reality is the fact that if a responsible developer decides to abandon a particular site because of environmental sensitivity, there are no state or federal regulations or guidelines that prohibit another developer from pursuing a wind project on that site. Unless the playing field is leveled and all developers are held accountable equally, through regulation or guidelines that are linked to permitting, renewable portfolio standards, and the Production Tax Credit, sensitive, high risk sites could be developed in the future.

The USFWS issued voluntary guidelines in 2003 to avoid and minimize wildlife impacts by wind turbines and consults with industry on project scope and issues, recommends studies and relevant information, reviews/comments on studies and applications, makes recommendations and coordinates with state regulatory and authorizing entities and interested parties. When incidental take is likely to occur, the USFWS recommends to the developer that a Habitat Conservation Plan be prepared pursuant to Section 10(a)(1)(B) of the Endangered Species Act, the preparation of which is voluntary. The Service also advocates for implementation of a pre-filing 3-stage consultation process that would include 1) scoping of wildlife issues, 2) studies to address issues raised in scoping, and 3) review of study results and recommendations. This is the same process codified in FERC regulations for hydroelectric projects (18 CFR 4.38).

State and federal agencies and other stakeholders have participated with processes like the National Wind Coordinating Committee and have sponsored or participated in conferences, workshops, and symposia at professional meetings. Federal and state agencies also have joined with other stakeholders in research partnerships like the Bats and Wind Energy Cooperative (<http://www.batcon.org/home/index.asp?idPage=55>) and the NWCC facilitated Grassland and Shrub Steppe Species Collaborative (http://www.nationalwind.org/workgroups/wildlife/g3c_overview.pdf). These efforts are important, positive steps, but state and federal agencies require more support, including funding, to effectively participate in these endeavors.

Wind energy is expanding rapidly within the range of threatened and endangered species of bats such as the Indiana bat (*Myotis sodalis*), the gray bat (*Myotis grisescens*), and the Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Although no threatened or endangered species have been found killed at existing wind facilities, not all sites have been searched thoroughly or for multiple years, and bats are very difficult to find during searches. Most biological assessments conducted at existing and proposed facilities have used literature searches, limited site visits and survey efforts, and present habitat conditions to speculate the potential impact on threatened and endangered species of bats; interestingly, almost all conclude no impacts with limited empirical evidence for support. New evidence from radio-telemetry studies in Pennsylvania and New York suggests that Indiana bats travel considerable distances across ridges and may in fact be at risk given their flight paths from hibernacula to summer habitat (see http://www.pgc.state.pa.us/pgc/lib/pgc/reports/2006_wildlife/71402-05.pdf for an example). Continued development of wind facilities will likely pose risks to these species and increase the probability of take. Some species could be pushed to threatened or endangered status resulting proximately, ultimately, or independent of wind energy development. More studies are needed to fully elucidate risk of all bats, including endangered species.

Better Coordination and Integration is Needed. Given projected increases in multiple sources of energy development, including biomass, wind, and oil and gas development, future conflicts surrounding land-use, mitigation, and conservation strategies should be anticipated. Habitat mitigation options, for example, when developing wind in open prairie may be compromised by development of other energy sources. State and federal agencies must partner with multiple stakeholders to implement regional assessments of existing and future land uses. Planning regional conservation strategies among industries, agencies and private landowners could reduce conflicts and increase options for conservation. Comprehensive monitoring and research programs are needed to gather required information to develop better siting guidance and mitigation strategies in the immediate future.

2) *What is the status of bat populations?*

Key Points:

- Little is known about historical or current populations of most species of bats, but many are believed to be in substantial decline.
- Bats are long-lived and have exceptionally low reproductive rates, population growth is relatively slow, and their ability to recover from population declines is limited.

- Although population impacts are unknown, given the level of fatalities at some wind facilities significant cumulative impacts must be considered for some species.

Some species could be pushed to threatened or endangered status resulting proximately, ultimately, or independent of wind energy development.

More than 1,100 species of bats worldwide account for nearly a quarter of all mammals, yet their populations are poorly understood. Many populations have been extirpated or have declined alarmingly (O'Shea and Bogan 2003). Eastern red bats, for example, are one the most frequently killed species, yet are already reported to be in decline (Whitaker et al. 2002, Carter et al. 2003, Winhold et al. 2005). There are nine species or subspecies of bats in the U.S. and territories that are listed as endangered under the U.S. Endangered Species Act, and 24 that are designated as species of concern (formerly Category 2 candidates for listing under the ESA; O'Shea and Bogan 2003). Like birds, bats play essential ecological roles in maintaining the balance of nature. However, as previously mentioned, unlike birds, bats that are most frequently killed by wind turbines are not protected under federal law and, although bats usually are protected under state laws pertaining to "nongame" animals, most states do not enforce take of bats.

Little is known about historical or current populations of most species of bats. Better information exists for species of bats that primarily use caves for either winter hibernation (e.g., gray and Indiana bats) or summer maternity roosts (e.g., Mexican free-tailed bat). Most experts base inferences on population trends from indices on changes in capture rates over time, winter counts at hibernacula, trends in habitat loss or protection, and public submissions of species for examination by state health departments (e.g., Carter et al. 2003). Unfortunately, current techniques are ineffective to quantify populations and no long-term studies exist for documenting changes in trends of tree- and foliage-roosting species of bats (Carter et al. 2003).

Bats are long-lived and have exceptionally low reproductive rates (Kunz 1982), population growth is relatively slow, and their ability to recover from population declines is limited, thereby increasing the risk of extinctions (Barclay and Harder 2003, Racey and Entwistle 2000, 2003). Habitat loss and degradation, disturbance and/or loss of roosts, and persecution by fearful humans have contributed greatly to the decline of many species of bats (Kunz 1982, Pierson 1998, Racey and Entwistle 2003). Fatality of bats at wind turbines has been recognized only recently as a major conservation concern. Although population impacts are unknown, given the level of fatalities thus far documented at wind facilities, biologically significant additive mortality must be considered for some species as wind power development expands and fatalities accumulate (Kunz et al. 2007). As previously mentioned, some species could be pushed to threatened or endangered status resulting proximately, ultimately, or independent of wind energy development.

Kunz et al. (2007) projected numbers of bat fatalities in the Mid-Atlantic Highlands from wind turbines expected in to be installed by 2020 (installed capacity of 2,158 MW based on National Renewable Energy Laboratory WinDS Model for the Mid-Atlantic Highlands for the year 2020 [<http://www.nrel.gov/analysis/winds/>]); they projected 32,818 to 64,281 would be killed in just one year in this region under the assumptions used. The potential for serious cumulative impacts is obvious in just this one region and when considering all regions continent-wide and over the full life of a project (20-25 years), the numbers escalate rapidly and heighten concerns.

- 3) *To what degree does industry account for bats in their preliminary planning and subsequent construction and operation of wind turbines?*

Key Points:

- Pre-construction studies are inconsistently implemented across states, ranging from no effort to intensive studies, but are typically short duration, lack clearly stated objectives, and are under funded to adequately evaluate true risks to bats and other wildlife.
- Correlations between pre-construction monitoring data and post-construction bat fatality rates currently do not exist, seriously limiting our understanding of risks.
- Post-construction studies vary in duration and intensity and often are seriously biased depending on how well investigators design the study and account for field sampling biases (e.g., searcher efficiency, scavenger removal, habitat variation, seasonality).
- Industry has collaborated with partnerships such as the Bats and Wind Energy Cooperative to conduct needed research to understand issues and develop and test mitigation strategies.

- There is an immediate need to increase support for research programs that address priority needs for pre-and post construction monitoring and to develop and test mitigation strategies.

Pre-construction. Industry has performed pre-construction studies, but there are no consistent requirements and level of effort ranges from no work to extensive studies, the later being a rare extreme (see Arnett et al. 2006 as an example). Pre-construction studies have lacked consistent implementation of methods and often are fundamentally flawed in a number of ways. They are typically short duration, lack clearly stated objectives, and are under funded to adequately evaluate true risks to bats and other wildlife. Pre-construction surveys for bats commonly employ mist nets and acoustic detectors to assess local bat species presence and activity. However, using this information to predict bat fatality and, thus risk at a site has proved to be challenging. Mist netting may be useful for determining presence of a species on site, but multiple surveys are required (Weller and Lee 2007) and mist netting does not confirm absence of a species. Unfortunately, past and current efforts to acoustically monitor bat activity prior to construction of turbines may suffer from flaws in study design, including small sample sizes, poor temporal and spatial replication, and inappropriate inference because limitations and assumptions were not understood or clearly articulated (Hayes 2000). Also, there is a lack of information and lack of agreement among stakeholders, biologists, and scientists regarding what constitute different levels of risk in relation to bat activity and potential fatality of bats at wind facilities. Perhaps most importantly, we currently are unaware of any study that has correlated pre-construction monitoring data with post-construction fatality, a fundamental link necessary for extrapolating pre-construction data to predict potential risk of wind facilities to bats. More extensive pre- versus post-construction comparisons are urgently needed to understand risk-levels and to develop criteria for high risk sites that should be avoided.

Post-construction. At least some post-construction monitoring for birds has been conducted at most existing wind facilities, though bat fatalities were typically recorded only incidentally. Nevertheless, bat kills have been documented at almost every facility where post-construction searches were conducted. However, until recently, efforts to specifically estimate bat fatality rates have been rare. Criticism of survey protocols used in past efforts centers on field sampling biases (e.g., small sample sizes, poor accounting for carcass removal by scavengers and searcher efficiency, and failure to account for detectability among habitats) that can profoundly bias the number of estimated fatalities. Searches are typically conducted at seven, 14 or 28-day intervals, and often do not adequately account for scavenger removal rates or searcher efficiency. During an intensive 6-week study at Mountaineer, West Virginia, scavengers removed up to 70% of killed bats within 24 hours, and at Meyersdale, Pennsylvania, searcher efficiency averaged only 25% on this heavily vegetated site (Arnett, 2005). With few exceptions, post-construction studies are conducted for just 1-2 years.

Both pre- and post-construction studies have lacked standardized procedures, thus making it impossible for broad comparisons that could facilitate an understanding of potentially cumulative impacts or of the relative risks associated with varied habitat and topography. Most have been conducted without adequate peer review of methodology, results, or interpretations of findings, and few studies have been published in the scientific literature, although that trend is starting to change.

It is critical that future post-construction monitoring be conducted using standard protocols for consistency so as to facilitate broad comparisons among facilities. Daily searches are required at some turbines in order to correlate fatality with weather variables. This is important because several studies have reported that most bat fatalities occur on low wind nights (Fiedler 2004, Arnett 2005, Brinkmann 2006) and understanding these patterns will help determine predictable periods of high fatality for implementation of mitigation measures such as curtailment of operations. More research is needed on fatalities in regions with existing wind facilities that have been poorly studied (e.g., eastern forested ridges, the southwest) and regions with new developments (e.g., coastal areas). There is an urgent need for increasing support for comprehensive, interdisciplinary research programs that address priority needs to quantify risks and document the success of potential solutions. Funding should emphasize cooperative efforts among private organizations, industry, and government agencies.

- 4) *What legislative actions might Congress consider to ensure that an expansion of wind energy does not come at an unnecessary expense to bats and other wildlife?*

Federal funding. Perhaps the most important and immediate legislative action involves funding support at two broad levels: 1) agency support for environmental

review, permitting, and oversight; and 2) research initiatives to quantify impacts and find and test solutions.

Wind energy development is relatively new and emerging wildlife issues have created financial burdens on federal agencies responsible for public trust resources. It is our opinion that the USFWS, for example, is grossly understaffed and underfunded to effectively handle the onslaught of permits for wind development on both private and public lands. As wind energy has now expanded beyond private lands and onto public lands, the Nation's resource management agencies, most notably the Bureau of Land Management, U.S. Forest Service, and Mineral Management Service, have now been dealt an additional land use objective that requires environmental review, permitting, and monitoring to evaluate and reduce environmental impacts and protect public trust resources. Unfortunately, land management agencies already are facing budget constraints and simply cannot deal effectively with a new management issue like wind energy permitting without funding and staffing in addition to an already constrained situation. This situation creates potential threats to wildlife and costly delays for industry. Stream-lining or eliminating processes for environmental review on the impacts of wind energy on wildlife are unacceptable and both state and federal agencies need support to adequately participate.

Second, we sorely lack the scientific information required to make decisions. Federal funding has been minimal and sporadic at best and additional appropriations to support research initiatives will be critical in the immediate future. This should include appropriations to all federal agencies involved with wind energy development, and also to the National Science Foundation, National Fish and Wildlife Foundation, and other appropriate venues for supporting much needed research on wind energy and wildlife.

A second approach would involve establishing a federal fund for priority research on the impacts of wind energy on wildlife. This funding could be appropriated to and administered by the National Renewable Energy Laboratory, for example. Wind developers could draw funding for the wildlife research associated with a project and if that project is built, the developer would re-pay the fund. A scientific advisory committee would determine: (a) what research needs to be done at a given site; (b) how research should be done (e.g., the study design should be peer-reviewed); and (c) peer-review processes required for credibility of work performed. All research findings would be available to other wind developers and the public. This would lead to developing a body of well-designed, peer-reviewed, accessible research that helps evaluate potential impacts of wind energy on wildlife and that decision-makers can rely on to assess information for individual sites.

Federal Tax-Credit and links to wildlife protection. While realizing it is not the charge of this subcommittee, Congress should strengthen the Federal Productive Tax Credit (the tax credit extension H.R. 197 currently is in Ways and Means) by requiring wind projects to meet standards, including best management practices and guidelines, developed by federal agencies and other stakeholders to protect wildlife and their habitats. Such provisional conditions would help level the playing field among developers and provide equal consideration for wildlife among projects and over the duration (20-25 years) of projects.

Although a state-level issue, we also believe that Renewable Portfolio Standards should account for wildlife impacts and inclusion of guidelines in the permitting process, further strengthening agency participation in permitting and implementation of guidelines.

Migratory Bat Treaty Act. Migratory bats currently are not offered laws for protection and conservation across borders similar to migratory birds. Given new threats to bats from wind turbines across the North American Continent, we believe it is now time for federal adoption of such a law similar to the Migratory Bird Treaty Act. Such an act would foster protection for bats and better collaboration for conservation.

CONCLUSION

In conclusion, Bat Conservation International recognizes threats to our environment from climate change and supports the development of clean, renewable energy sources. Nevertheless, current evidence has led to consensus among leading experts that cumulative impacts of wind energy development could become severe if facilities continue to operate without careful planning to minimize harm to birds and bats, both of which are ecologically essential. We believe that minimizing and mitigating harmful impacts to wildlife is an essential element of "green energy" and that developers of wind energy must substantially increase efforts to improve siting and develop and test methods to minimize harm to wildlife. Additionally, the federal government must increase its efforts and funding to support the responsible development of wind energy while protecting wildlife resources. Cooperation, access to

study sites, funding, and transparency of information from industry have been mixed. We are pleased with progress of efforts such as our partnership on bats and wind energy and other collaborative efforts, and applaud those companies and organizations working proactively with resource agency specialists and scientists to solve problems. Unfortunately, more has to be done immediately to expand and improve the breadth of our cooperation in developing a sound, scientific basis for decision-making.

To quote from a distinguished colleague, Dr. Gary White, and a paper he published in 2001 (White 2001): “All too often in wildlife management, [we] are asked to resolve conflicts that are impossible because the basic biological knowledge to understand the issue is lacking. All stakeholders are right, under the assumptions each brings to the issue, but because the biological knowledge is inadequate to refute any of the assumptions, the conflict cannot be resolved in an objective fashion based on the biology of the problem.” Thus, we must ask ourselves “would we rather collect knowledge up front to resolve the issue or pay for litigation to resolve the issue without knowledge? In the end...such ‘train wrecks’ prove even more expensive in time, money, and consternation among the players and all the while decisions will be made without reliable knowledge.” History is replete with examples where science lags behind on-the-ground implementation. In the case of wind energy impacts on wildlife, the lag is due in large part to poor funding and commitment to priority research. We must increase cooperation, access to study sites, and logistical and financial support for research to gain the reliable knowledge needed for decision-making to solve wind energy and wildlife conflicts. This Subcommittee and Congress can make a difference through implementation of suggestions offered as part of this hearing.

Madam Chairwoman and Members of the Subcommittee, on behalf of Bat Conservation International I want to thank you for inviting me to share this information and assist you on this important issue. I would be happy to answer any questions you may have.

Literature Cited

- Arnett, E. B., editor. 2005. Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International, Austin, Texas, USA.
- Arnett, E. B., J. P. Hayes, and M. M. P. Huso. 2006. Patterns of pre-construction bat activity at a proposed wind facility in south-central Pennsylvania. An annual report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.
- Barclay, R. M. R., and L. M. Harder. 2003. Life histories of bats: life in the slow lane. Pages 209-253 in T. H. Kunz and M. B. Fenton, editors. *Bat ecology*. University of Chicago Press, Chicago, Illinois, USA.
- Brinkman, R. 2006. Survey of possible operational impacts on bats by wind facilities in southern Germany. Report for Administrative District of Freiburg—Department 56, Conservation and Landscape Management. Ecological Consultancy, Gundelfingen, Germany.
- Carter, T. C., M. A. Menzel, and D. A. Saugey. 2003. Population trends of solitary foliage-roosting bats. Pages 41-47 in T. J. O’Shea and M. A. Bogan, editors. *Monitoring trends in bat populations of the United States and Territories: problems and prospects*. U.S. Geological Survey, Biological Resources Discipline, Information and Technology Report USGS/BRD/ITR-2003-0003, Washington, D.C., USA.
- Dürr, T., and L. Bach. 2004. Bat deaths and wind turbines—a review of current knowledge, and of the information available in the database for Germany. *Bremen Beiträge für Naturkunde und Naturschutz* 7: 253-264.
- Fiedler, J. K. 2004. Assessment of bat mortality and activity at Buffalo Mountain Windfarm, eastern Tennessee. Thesis, University of Tennessee, Knoxville, Tennessee, USA.
- Government Accountability Office (GAO). 2005. Wind power impacts on wildlife and government responsibilities for regulating development and protecting wildlife. U.S. Government Accountability Office, Report No. GAO-05-906, Washington, DC, USA.
- Hall, L. S., and G. C. Richards. 1972. Notes on *Tadarida australis* (Chiroptera: Molossidae). *Australian Mammalogy* 1: 46.
- Hayes, J. P. 2000. Assumptions and practical considerations in the design and interpretation of echolocation-monitoring studies. *Acta Chiropterologica* 2: 225-236.

- Jain, A., P. Kerlinger, R. Curry, and L. Slobodnik. 2007. Annual report for the Maple Ridge Wind Power Project post-construction bird and bat fatality study—2006. Unpublished report prepared for PPM Energy and Horizon Energy. Curry and Kerlinger LLC.
- Johnson, G. D. 2005. A review of bat mortality at wind-energy developments in the United States. *Bat Research News* 46: 45-49.
- Kerns, J., and P. Kerlinger. 2004. A study of bird and bat collision fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia. Annual Report for 2003. Curry and Kerlinger, L. L. C., McLean, Virginia, USA.
- Kunz, T. H., editor. 1982. *Ecology of bats*. Plenum Publishing, New York, New York, USA.
- Kunz, T. H., E. B. Arnett, W. P. Erickson, A. R. Hoar, G. D. Johnson, R. P. Larkin, M. D. Strickland, R. W. Thresher, and M. D. Tuttle. 2007. Ecological impacts of wind energy development on bats: questions, research needs, and hypotheses. *Frontiers in Ecology and the Environment* 5: in press.
- Orloff, S., and A. Flannery. 1992. Wind turbine effects on avian activity, habitat use, and mortality in Altamont Pass and Solano County Wind Resource Areas, 1989-1991. Final Report to the California Energy Commission, Sacramento, California, USA.
- O'Shea, T. J., and M. A. Bogan, editors. 2003 Monitoring trends in bat populations of the United States and territories: problems and prospects. U.S. Geological Survey, Biological Resources Discipline, Information and Technology Report, USGS/BRD/ITR-2003-0003.
- Piorkowski, M.D., 2006. Breeding bird habitat use and turbine collisions of birds and bats located at a wind farm in Oklahoma mixed-grass prairie. Thesis, Oklahoma State University, Stillwater, Oklahoma, USA.
- Reynolds, D. S. 2006. Monitoring the potential impact of a wind development site on bats in the northeast. *Journal of Wildlife Management*: 70: 1219-1227.
- Weller, T. J., and D. C. Lee. 2007. Mist net effort required to inventory a forest bat species assemblage. *Journal of Wildlife Management* 71: 251-257.
- Whitaker, J.O., V. Brack, Jr., and J. B. Cope. 2002. Are bats in Indiana declining. *Proceedings of the Indiana Academy of Sciences* 111: 95-106.
- Winhold, L., and A. Kurta. 2006. Are red bats (*Lasiurus borealis*) declining in southern Michigan? *Bat Research News* 46: 229.
- White, G. C. 2001. Why take calculus? Rigor in wildlife management. *Wildlife Society Bulletin* 29: 380-386.

**Response to questions submitted for the record by
Edward Arnett, Bat Conservation International**

Questions from Mr. Brown:

(1) Mr. Arnett, what are the causes of bat mortality at wind farm facilities?

Without having clarified the question with your staff, I will answer this in two ways. First, the actual causes of death. Most studies report that the majority of bat fatalities discovered have obvious injuries including broken wings, broken back, and crushed skulls which are consistent with direct collision with moving blades. However, several studies report bat fatalities with no external trauma which suggests that some are killed either by “glancing blows” from the turbine blades further from the tip and more toward the blunt end near the hub, or through a phenomenon known as rapid decompression. Wind turbines produce obvious blade-tip vortices and if bats get temporarily trapped in these moving air masses it may be difficult for them to escape. Once trapped in these vortices, they may experience rapid pressure changes that could cause internal injuries leading to death. If bats are not killed, but only injured, and fall to the ground into habitats without shrubs or trees, many species of bats would not be able to lift off the ground, and thus would die because they require some level of height to drop, swoop and take off in flight. Other species are capable of lift off from flat ground. I do not believe that bats strike the turbine’s monopole or non-moving blades and are killed only by fast moving turbine blades. Thermal imaging video footage gathered at Mountaineer in 2004 shows bats investigating stationary turbines, chasing slow-moving blades, and consistently being struck by fast-moving blades, thus providing strong evidence to support this contention.

Second, there are several hypothesized reasons why bats are killed by wind turbines. Several colleagues and I believe that bats are attracted to turbines for perhaps any number of reasons. Leading attraction hypotheses include perception of turbines as roost trees, perception of roosts as rendezvous sites for migrating bats

to encounter mates during the fall breeding season, insect attraction to turbines which then attracts bats to feed, and sound attraction (both ultrasonic and audible below 20kHz—i.e., the “swishing” sound of moving blades). Regardless of the actual cause, we do not believe bat fatality at turbines is a random chance event and some level of attraction exists, which further complicates our efforts for mitigating impacts.

(2) If so little is known about the historical or current populations of most species of bats, how do you know they are substantially declining? Where is the scientific evidence or is your data based only on anecdotal information?

There is both scientific evidence and anecdotal observations over the past century that suggests bats were once far more numerous than they are today. There is strong supporting evidence for the decline of several cave-roosting species that are now endangered, most notably the Indiana bat and the gray bat. Methods for enumerating and tracking changes in populations of bats that hibernate in caves provide the most reliable data for trends of these species. Tracking populations of other species are far more problematic because several species that are widely dispersed, such as those that use forests for example, are extremely difficult to monitor and long-term trends difficult to establish. Nevertheless, scientists have used indices such as data from long-term mist-netting stations, records of the number of bats submitted to public health agencies for rabies testing, and measures of habitat loss to evaluate potential changes in numbers of some species of bats over time. Anecdotal observations from historic literature suggest that tree-roosting species like the red bat and hoary bat, those most frequently killed by turbines in North America, were once far more numerous. In the late 1890s, naturalist Edgar Mearns reported observations of “great flocks” of red bats migrating in the fall that would often take days to pass over. There are numerous other anecdotal accounts suggesting many species of bats were once far more abundant.

(3) Why don't states enforce their wildlife laws for bats?

I do not feel it is appropriate for me to speak on behalf of an agency and speculate why such laws are rarely if ever enforced. I suggest that specific states be contacted in regard to their regulations and enforcement in regard to non-federally listed species of bats.

(4) While I understand bats migrate across state lines, do they also migrate from the United States into Canada and Mexico?

Yes, several species are known to migrate across international borders. Hoary bats, for example, are known to breed far north into Canada and winter in Mexico. Other species of migratory tree-roosting bats, such as silver-haired bats and red bats, exhibit similar patterns. Brazilian free-tailed bats, which have been reported killed at wind facilities in Oklahoma, readily migrate into Mexico during winter.

(5) How many lawsuits have you or your organization filed against the Federal government in the last five years? Please elaborate on what issues the suits concerned and which agencies were the target of the lawsuit. Have you filed any related to wind power projects?

BCI has never filed a lawsuit against any entity in its history.

(6) Do you or any members of your organization serve on any Federal advisory panels or committees as a representative of your organization?

Founder and Executive Director Dr. Merlin Tuttle has served on the Indiana Bat Recovery Team from 1982 to present, and the Gray bat recovery team from 1981 to present.

(7) Do you, your organization, or any of the officers or full time employees of your organization receive any Federal grants, contracts or other funds? If so, please elaborate.

In addition to grants received from agencies in the Department of Interior and the National Fish and Wildlife Foundation that were disclosed prior to my testimony, BCI has partnered with several federal agencies including the U.S. Forest Service, Natural Resources Conservation Service, Department of Defense and others to achieve bat conservation and management objectives. For most projects, federal funds are matched with private funds generated by BCI.

Ms. BORDALLO. Thank you. Thank you very much, Mr. Arnett.
I would like now to invite Dr. Fry to testify.

**STATEMENT OF MICHAEL FRY, DIRECTOR,
BIRDS AND PESTICIDES, AMERICAN BIRD CONSERVANCY**

Mr. FRY. Chairman Bordallo, Member Sali, Distinguished Members of the Committee, I would like to thank you for inviting me to testify on wind projects.

My name is Dr. Michael Fry. I work for American Bird Conservancy. I am responsible for science and policy issues of wind project impacts on mortality and habitat impacts on birds and documenting the fact that there is more danger from these than communications towers or even house cats. However, as the U.S. develops many more of these wind projects, the projected kill will be about one to two million birds per year from wind.

Data from Fish and Wildlife Service and the U.S. Geological Survey indicated that at least 25 percent of all our native bird species are in decline. The mortality at wind farms is significant because many of the species most impacted by wind are already in decline, and all additional sources of mortality are significant.

Unfortunately, today the collaborative efforts to address the impacts of wind projects on birds have been a failure. The Department of Energy formed the National Wind Coordinating Committee in 1994. The NWCC has been an active forum for environmental issues, had developed fact sheets and methods documents to identify risks. The NWCC has recommended actions that could be taken by industry to prevent mortality and habitat destruction from wind projects.

The industry has largely ignored these recommendations as either too costly or unproven. The wind energy is essentially unregulated.

The wind industry has been constructing and operating wind projects for almost 25 years with little oversight. At the Altamont Pass in California more than a thousand Golden Eagles have been killed and have been put in the freezer. Not a single prosecution for killing eagles has been brought by Federal officials. No explanation has been provided why the Bald and Golden Eagle Protection Act has been ignored. Without any enforcement the industry has no incentive to prevent bird mortality.

Fish and Wildlife Service developed an interim series of voluntary siting guidelines in 2005. The Federal guidelines must be mandatory rather than voluntary when industry is provided ample evidence that they regard voluntary guidelines as unimportant and they have been ignored.

American Bird Conservancy wants to see meaningful Federal participation to solve wildlife problems. While I know it is not the purview of the Natural Resources Committee's jurisdiction, H.R. 197 has been introduced in the Ways and Means Committee to renew the Production Tax Credit for wind. ABC recommends that any renewal of the Production Tax Credit include amendments that require developers to follow best management practices to avoid bird impacts.

Because of the Federal tax credit, there is already a Federal nexus in all wind projects. ABC wants to see amendments that require a national mapping program to identify important areas and sensitive bird areas. We want to require efforts to reduce habitat loss during construction in the operation of wind projects. We want

to require modification or relocation of turbines that kill a disproportionate number of birds, and we want to require studies to implement real time radar at wind projects to signal when flocks of birds approach the project and require hour-by-hour shutdowns to avoid mortalities. These are currently being done in Spain at wind projects now.

The implementation and oversight of these measures would be best accomplished by identification of a Federal lead agency and to provide authority for enforcement and development of best management practices. The logical lead agency would be the Fish and Wildlife Service, or if they are overburdened or do not want to take that, the Federal Energy Regulatory Commission could be given this responsibility if there were adequate resources.

In my written testimony, I have described the groups of birds most at risk, and have also listed critical areas of research to protect birds. Also in my written testimony is a description of the failure to protect critically endangered Puerto Rican Nightjar, a bird species with a total population of less than 1,700 individuals.

In 2006, the Fish and Wildlife Service granted an incidental take permit to destroy dozens of nesting territories and allow construction of a major wind project in Puerto Rico in areas described by the Department of Energy as poor to marginal wind. This is a prime example of the lack of responsibility of Federal oversight to protect fish and wildlife in projects.

Thank you again for the opportunity present my testimony. I will be happy to answer any questions.

[The prepared statement of Mr. Fry follows:]

**Statement of Donald Michael Fry, PhD, Director,
Pesticides and Birds Program, American Bird Conservancy**

Chairman Bordallo, Ranking Member Brown, and distinguished members of the Fisheries, Wildlife and Oceans Subcommittee, I would first like to thank you for inviting me to testify on behalf of the American Bird Conservancy (ABC) on the effects of wind turbine energy projects on birds in the United States.

My name is Dr. Michael Fry, and I am the Director of the Pesticides and Birds Program at American Bird Conservancy. In addition to being responsible for science and federal policy issues concerning pesticides, my job includes federal policy and science issues related to the effects of wind projects on mortality and habitat impacts to birds.

My qualifications include a PhD in Animal Physiology from the University of California, Davis, and 30 years experience in avian ecology and toxicology at the University of California and at American Bird Conservancy. I am a member of the Wildlife Workgroup of the National Wind Coordinating Committee, funded by the U.S. Department of Energy I serve on the Minerals Management Service, Outer Continental Shelf Environmental Studies Program, Science Advisory Committee, and am Chair of the Subcommittee on Alternative and Renewable Energy.

American Bird Conservancy (ABC) is a 501(c)3 not-for-profit organization, whose mission is to conserve wild birds and their habitats throughout the Americas. It is the only U.S.-based, group dedicated solely to overcoming the greatest threats facing birds in the Western Hemisphere. In brief, ABC has been an active participant in national symposia on wind power, birds and wildlife for the past ten years and believes that with proper siting, operation, and monitoring, wind energy can provide clean, renewable energy for America's future with minimal impacts to birds and bats. ABC has developed a policy statement on wind energy and birds available on our website at: <http://www.abcbirds.org/policy/windenergy.htm>

Unfortunately, to date, collaborative efforts to successfully address the impacts of wind projects on birds and wildlife have been a failure.

As members of this subcommittee may know, the Department of Energy formed a consensus-based collaborative in 1994, the National Wind Coordinating Collaborative (NWCC), which is comprised of representatives from the utility, wind

industry, environmental, consumer, regulatory, power marketer, agricultural, tribal, economic development, and state and federal government sectors. The purpose of the collaborative was “to support the development of an environmentally, economically, and politically sustainable commercial market for wind power”. The NWCC has been an active forum for discussion of environmental issues, and subcommittees of the NWCC have developed several fact sheets and methods and metrics documents in an effort to identify risks to wildlife from wind projects, and to recommend actions that could be taken by industry to prevent, reduce, or mitigate collision mortality and habitat destruction arising from the construction and operation of wind projects within the US.

My experience with NWCC, however, has been that there has been much discussion and almost no real action on the part of the wind industry to resolve bird collision issues at wind project areas.

The wind energy industry has been constructing and operating wind projects for almost 25 years with little state and federal oversight. They have rejected as either too costly or unproven techniques recommended by NWCC to reduce bird deaths. The wind industry ignores the expertise of state energy staff and the knowledgeable advice of Fish and Wildlife Service employees on ways to reduce or avoid bird and wildlife impacts.

Federal and state oversight for wind energy projects has been virtually nonexistent.

Federal participation in regulation and enforcement of wind energy has been particularly conspicuous in its absence. At Altamont Pass Wind Resource Area, more than a thousand Golden Eagles have been killed, and enforcement officials have archived carcasses for decades. Not a single prosecution for take of eagles has been brought by federal officials, and no adequate explanation has ever been provided to explain why the Bald and Golden Eagle Protection Act has been ignored for so long.

The Fish and Wildlife Service developed an interim series of voluntary siting guidelines in 2003, and revised them after a prolonged comment period in 2005. Federal guidelines must be required rather than voluntary. The wind industry has provided ample evidence that voluntary guidelines are regarded as unimportant and are thus summarily dismissed.

The State of California has worked diligently to document habitat issues and bird kills. They have recommended studies to evaluate techniques to prevent or minimize the killing of birds of prey at several wind resource areas in California. Permits for development and operation continue to be issued by California and its counties. They have done so after being promised by wind developers that the wind industry would take all measures “feasible” to prevent or minimize bird injuries and deaths. However, without any meaningful regulatory oversight or enforcement, the industry has exhibited very little change in its behavior over the past 25 years. Technology has advanced substantially, and promises have been made that newer technologies would reduce bird deaths, but very little evidence has been provided by industry to substantiate their claims.

In fact, when independent researchers finally gained access to the Altamont Pass area, under contract from the California Energy Commission, the results of their research and documentation were viscously attacked by staff from the California Wind Energy Association. Every effort was made to discredit the research and personally discredit the researchers. The NWCC website provides an excellent bibliographic resource to much of this information, and documents and links are available at: <http://www.nationalwind.org/workgroups/wildlife/>.

The State of Maryland has recently exempted wind projects from meaningful environmental review. Maryland has eliminated the requirement for a Certificate of Public Convenience and Necessity (CPCN) before construction of a wind farm. The law eliminates the ability of stakeholders other than the wind developer to have input into the process. The law now: 1) Exempts wind energy developers from obtaining a Certificate of Public Convenience and necessity (CPCN) from the Public Service Commission. The developer only needs a construction permit.; 2) Blocks the public from having meaningful participation in the decision process for wind energy projects; and 3) Prevents public and expert testimony at Public Service Commission hearings for wind energy projects proposed on state-owned lands and offshore, in waters of the Chesapeake Bay.

In summary, there has been a great deal of discussion and very little action on the part of industry and the federal government to resolve bird and wildlife issues.

Bird populations at greatest risk include birds of prey and grassland songbirds.

The bird species at risk at individual wind projects vary greatly, as habitats with good wind resource are highly variable across the US. In general, the two bird species groups at greatest risk are birds of prey, (both hawks and eagles that hunt during the day, and owls, which are nocturnal, and hunt at night) and grassland birds, species groups living in the Great Plains and in flat or rolling hill country in the Pacific Northwest, California, and Texas.

The bird species that have been documented to have the greatest risks from collision mortality are:

Collision Mortality Risk:

Birds of Prey:

Especially in California and the Pacific Northwest
 Golden Eagles
 Red-tailed Hawks
 White-tailed kites
 American Kestrels
 Burrowing Owls
 Barn Owls
 Great Horned Owls

Grassland ground birds and songbirds:

Especially in the Pacific Northwest and Great Plains
 Horned Larks
 Mourning Doves
 Swallows
 Pheasants
 Western Meadowlarks
 Sparrows-several species

“Generalist” species, found in many places:

Gulls-several species
 Common Ravens

Migratory birds

Warblers-several species
 Thrushes
 Wrens
 Sparrows and finches
 Bluebirds
 Swallows
 More than 50 species of other migratory songbirds

Habitat loss:

Especially in the Great Basin and the Great Plains and Texas
 Sage grouse
 Prairie chickens

Birds of prey have long been recognized as the most vulnerable group of birds to suffer direct mortality from collisions with rotor blades of wind turbines. It appears that resident birds are killed in the greatest numbers, that is, those birds that live in the area of the wind project and are apparently killed while hunting. This has been a particularly difficult problem in California at Altamont Pass and also at the Montezuma Hills wind area in Solano County. The risk to resident birds of prey appears directly related to the population density of birds of prey in the area. To date, very few well documented mitigation attempts have been tried to reduce the kills of birds of prey at existing wind projects.

There have been early planning efforts at one major wind project: Foote Creek Rim, Wyoming, where careful location of wind turbines to avoid raptor flight patterns has resulted in minimizing collision mortality of birds of prey. This type of effort should be undertaken at every wind project, early in the planning stages, prior to leasing land or siting turbines.

Grassland bird species are also at risk of both collision mortality and habitat loss. Horned Larks are a small songbird species that has been disproportionately killed at windfarms in the Great Basin and Great Plains, apparently because of courtship behaviors that involve aerial display flights that take the birds into the path of turning rotors. Other ground dwelling songbirds and grouse are not at as high risk from collision mortality, but may be at very high risk of disturbance and displacement from wind projects, because of their apparent aversion to tall structures.

Active research sponsored by the NWCC and funded by others is ongoing, in an effort to identify the displacement risks to grassland species.

Habitat loss in Puerto Rico and threats to the endangered Puerto Rican Nightjar:

The Puerto Rican Nightjar is a critically endangered insect eating “Whip-poor-will” like species, with a total population estimated at less than 1700 individuals. They live in tropical dry forests at only a few locations in Puerto Rico, and have been listed as Endangered by the FWS since 1973. In 2006, the FWS granted an incidental take permit to destroy approximately 46 nesting territories in prime habitat in Guayanilla, Puerto Rico, to allow the construction of a major wind project (WindMar) in an area described as “marginal” wind resource by the Department of Energy. It is completely inexplicable why the FWS would grant such a permit to allow destruction of an endangered species for development of a wind farm at a marginal resource, with a very inadequate habitat conservation plan under the ESA. This is a prime example of the lack of regulatory oversight provided by the FWS to protect wildlife at wind projects.

A Proposal for Meaningful Federal Participation to solve wildlife problems:

While I know that it is not the Natural Resources Committee’s jurisdiction, there is a bill in the Ways and Means Committee to renew the production tax credit for wind energy, H.R. 197. ABC recommends that any renewal of the production tax credit include provisions that require meaningful research into ways of minimizing bird and bat kills by wind projects, and require developers follow standard Best Management Practices (BMPs) in avoiding and minimizing bird and wildlife impacts.

Below several important research topics that have not been adequately addressed since their discovery shortly after operation of the wind projects at Altamont Pass began 25 years ago. When answers to these questions are available, they should be incorporated into the BMPs, and enforced by the appropriate authorities. The logical federal agency to have authority over promulgation and enforcement of BMPs would be the FWS.

- Require efforts to reduce habitat loss during construction and operation of wind projects.
- Require adequate studies prior to siting wind projects to avoid important and sensitive bird areas.
- Require modifications to locations or operation of turbines that kill a disproportionate number of birds.
- Require real-time radar to be installed at wind projects that are located in regions with high numbers of migratory birds, and require project shut-downs when flocks of birds at risk from collisions are detected approaching the wind project.

Critical research needs to be done in the following areas:

Identification of important bird areas.

These areas should be off-limits to wind development unless adequate preventative measures can be discovered to minimize incidental take of protected bird species.

Better analysis of direct mortality.

The methods used to evaluate collision mortality in operating wind farms are controversial and uncertain in their conclusions. Birds and bats killed by wind turbines are searched for by field teams at infrequent intervals, and the methods to extrapolate to the true number of birds or bats killed still remain controversial. For example, it is unknown whether small birds struck by a turbine blade moving with a speed of greater than 150 mph remain intact, or whether they disintegrate into a “poof” of feathers and small fragments. It is unknown how far carcasses of small birds that do remain intact can be catapulted by a turbine blade that is 130 feet long traveling at 150 mph. It is unknown how frequently and quickly scavengers remove carcasses of dead or injured birds, so that monitoring personnel (when present) do not observe the mortality. The formulas and algorithms used to estimate scavenging rates remain controversial and the environmental community remains skeptical of the accuracy of mortality estimates.

Do turbines on ridge tops significantly affect migrants?

The “typical” modern turbine is a 1.5 MW, 3 blade monopole turbine with a hub height 55-80 m (180-260 ft.) above ground level, and turbine blade length of 35-40 m (115-130 ft.). The rotor typically spins at 12-20 rpm, and the rotor tip travels at 150-180 mph. The height of the rotor, the speed of the blades, and the speed of the

wind are all factors in where a bird carcass might land after being struck by a blade.

Recent published scientific reports indicate that greater than 10% of nocturnal migrating songbirds migrating over ridges fly at elevations putting them within the area of rotating turbines (Mabee et al. 2006, WILDLIFE SOCIETY BULLETIN 34(3):682-690). It is not known whether these birds are at risk of being struck by turbine blades, whether they can adequately avoid them, and whether inclement weather might increase the collision risk, as it does with communications towers.

What locations in the U.S. are unsuitable for wind projects? This would be based on the presence of vulnerable bird and bat species.

What areas of the U.S. are significant migratory corridors or broad regions with huge numbers of migratory birds, both songbirds and raptors?

The Gulf Coast of Texas and Louisiana are known to be critical passage areas for billions of protected migratory bird species. Weather radar has been employed to evaluate the numbers of birds migrating along the Texas coast, and flocks of millions of birds are routinely observed in spring and fall. Texas, however, does not even involve its Department of Parks and Wildlife in the permitting process, which is carried out by the Texas General Land Office. I believe this is totally unacceptable.

Can real-time radar and short-term turbine shutdowns successfully prevent mortalities of migrating birds without economic hardship to wind projects and without harmful interruptions to the electric grid?

Real-time radar is currently operational in Spain to prevent collision mortality to migrating birds of prey. This or similar technologies need to be developed in this country, in spite of the frequently heard statement that such measures are too costly, and that financiers of projects will not stand for the economic loss from temporary or seasonal shutdowns. The World Bank is requiring such technologies to be developed at wind projects in Mexico to prevent mortalities to migrating hawks that funnel through the Oaxaca region in very large numbers.

Can automated technologies be developed that detect bird strikes to turbine blades?

If acoustic, photographic or other sensitive automatic detectors could be developed within rotor blades or turbine hubs to monitor bird strikes, the uncertainty and expense of carcass searches and repetitious monitoring of wind farms could be eliminated, and better information on problem turbines would be generated. The costs of incorporating sensitive detectors into rotor blades or hubs would be very small compared to the overall costs, and cost reductions from reduced monitoring and analysis would be significant.

How will bird strikes be evaluated at offshore wind projects?

Which bird species (ex Brown Pelicans and Gannets) are at risk from offshore wind projects?

Will offshore wind projects exclude wintering migratory sea ducks and other birds from traditional feeding habitats?

The last three questions deal primarily with offshore wind projects, and need to be addressed to the Minerals Management Service Environmental Studies Program, as they gear up for environmental studies in conjunction with leasing offshore areas for wind projects.

All of these unanswered questions have been posed to the National Renewable Energy Laboratory of the Department of Energy and to the Minerals Management Service. At the current time there is no adequate budget to answer these or other questions, but wind projects are going forward at an increasing rate without answers to these questions, and without adequate involvement of the Fish and Wildlife Service for development of enforceable guidelines for preventing or minimizing bird kills and habitat losses.

Biological Significance of wind turbine mortality.

While the actual number of birds killed by wind turbines is unknown, estimates have been made in the range of 30,000 to 60,000 per year at the current level of wind development. The wind industry is prepared to increase the number of turbines 30 fold over the next 20 years, in order to fulfill the President's request that renewable energy projects supply 20% of the nation's energy needs by 2030.

At the current estimated mortality rate, the wind industry will be killing 900,000 to 1.8 million birds per year. While this number is a relatively small percentage of the total number of birds estimated to live in North America many of the bird

species being killed are already declining for other reasons, and losses of more than a million birds per year would exacerbate these unexplained declines. Data from the FWS Migratory Bird Management and Breeding Bird Survey by the U.S. Geological Service indicate that at least 223 species of our native bird species are in significant decline (about 1/4 of all species in US). The mortality at wind farms is significant, because many of the species most impacted are already in decline, and all sources of mortality contribute to the continuing decline.

Thank you once again for the opportunity to present my testimony today Chairman Bordallo.

Response to questions submitted for the record by Dr. Michael Fry

Questions from Ranking Minority Member Brown

- (1) Why are so many birds being killed at the Altamont Pass Wind Resource Area? Is it a siting problem, outdated technology or some other factors? Should this facility be closed?**

The Altamont Pass Wind Resource area was the first large scale wind project in the United States, and was built in a rural area of Central California that has a very high resident population of eagles, hawks and owls, as well as a large population of birds of prey that migrate from northern areas and winter in Central California. The area also has a large population of ground squirrels and rabbits, which are the main prey resources for the birds of prey. The most significant problem at Altamont appears to be resident and wintering birds that actively hunt these prey, and while focusing on prey, they do not watch where they are flying, and they collide with turbine rotors and are killed. There is relatively little evidence that migrating birds passing through the Altamont area are killed while migrating.

The County of Alameda, the California Energy Commission (CEC), and the wind farm operators have participated in several large studies to determine ways to minimize the mortalities, and to determine which turbines are most dangerous to birds. Because the Altamont area has more than 7000 turbines of several different designs, it is a very good place to study the problem, and try different mitigation methods. Fortunately, in the last few years, the County and CEC have been able to persuade the operators to actively participate in finding solutions to the problem, because many of the turbines are now obsolete, and the projects need to be "repowered" with newer, more modern, turbines that are more efficient, and, hopefully, less dangerous to birds. As condition of the new repowering agreements, the wind farm operators have been required to begin intense studies and mitigation trials to identify the best turbine designs, identify problem turbine locations, move or shut down individual problem turbines, and conduct land management activities to try and reduce the number of rodents living in the area. This involves managing cattle grazing on the land, moving rock piles that are havens for rodents, and other measures to reduce rodent populations. Turbine rotor blade painting, placing new turbines away from flight corridors, changing the heights of turbines to move them out of flight paths, and installing bird diverter pylons are all methods that are being studied to solve the collision problems.

I believe that the Altamont is our best "field laboratory" for working to reduce bird kills, and that active management needs to continue if regulators and the industry are to find the best management practices that will be used at other projects to reduce wildlife mortality. I do not believe Altamont should be shut down at the present time.

- (2) Dr. Fry, is it safe to say, you disagree with the General Accounting Office that concluded in 2005 that "Studies from these two locations (Altamont Pass and Mountaineer) stand in contrast to studies from other wind power facilities. These studies show relatively lower bird and bat mortality"? Please cite your studies?**

I participated in the writing of the document: "Wind Turbine Interactions with Birds and Bats: A Summary of Research Results and Remaining Questions", November 2004, published by the National Wind Coordinating Committee, which I have included as an attachment to this letter. The wildlife workgroup reviewed and compiled all available data, both public and proprietary industry data, on wind farms that was available to do the statistical analysis for the report. Much of the data in the report were the data used by the GAO in their analysis.

While the GAO report concludes that only California and Appalachia have been identified as areas with high mortality, the conclusions do not accurately reflect the data presented in the GAO report. Table 3 of Appendix II is particularly important, and has been included below.

Appendix II

Studies of Bird, Bat, and Raptor Fatality Rates, by Region

Table 3 includes only studies where calculating bird or bat mortality was a primary goal. Some studies may contain more than one study location.

Table 3: Studies of Bird, Bat, and Raptor Fatality Rates, by Region

Region	Location and year	Number of turbines	Fatalities per turbine, per year		
			Birds	Bats	Raptors
Pacific NW	Stateline, OR - 2003	181	1.93	1.12	0.06
	Nine Canyon, OR - 2003	37	3.59	3.21	0.07
	Klondike, OR - Phase I - 2003	16	1.16*	1.16	0
	Vansycle, OR - 2000	38	0.63	0.74	0
West	Footo Creek Rim, WY - 2003	69	1.5	1.34	0.03
	National Wind Tech Center, CO - 2003	Varies	0	0	0
California	Altamont Pass, CA - (Thelander et al) - 2003	5,400	0.19 ^a	***	***
	Altamont Pass, CA - (CEC) - 2004	5,400	0.67	0.004	0.24
	Altamont Pass and Solano County, CA - 1992	7,340	***	***	0.058 (1989) 0.025 (1990)
	Altamont Pass, CA - 1991	3,000	***	***	0.047 ^b
	Montezuma Hills, CA - 1992	600	0.074 ^b	***	0.047 ^b
Midwest	Buffalo Ridge, MN - P1 - 2000	73	0.98	0.26	***
	Buffalo Ridge, MN - P2 - 2000	143	2.27	1.78	***
	Buffalo Ridge, MN - P3 - 2000	138	4.45	2.04	***
	Buffalo Ridge, MN - (Osborn et al) - 2000	73	0.33-0.66	***	***
	Buffalo Ridge, MN - (Bats) - 2004	281	***	3.02 (2001) 1.3 (2002)	***
	Northeastern, WI - 2002	31	1.29	4.26	0
	Top of Iowa - 2004	89	0.12 ^c	1.88 ^c	***
Northeast	Searsburg, VT - 2002	11	0	***	0
Appalachian Mt. Region	Mountaineer, WV - 2004	44	4.04 ^d	47.53 ^d	***
	Tennessee - 2005	3	7.28	20.8	***
	Mountaineer, WV - 2005	44	***	38.0 ^e	***
	Meyersdale, PA - 2005	20	***	23.0 ^e	***

Source: GAO analysis of various scientific studies and reports.

Notes:

*** indicates that the study authors did not calculate a mortality rate for that category.

Some of the studies that presented a bird/turbine/year mortality rate also included raptors in that calculation. With the exception of the studies conducted in the Appalachian region, most of the studies listed were designed and timed to focus on bird mortality. Bats were found only incidentally to the study.

Table 3 shows that the Altamont Pass area has a lower mortality rate than many other areas around the US, but because of the very high number of turbines, the overall kill at Altamont is higher than other areas. The Altamont Pass mortality rate for birds is 0.19-0.67 birds per turbine, while 4 facilities in Oregon, and facilities in Wyoming, Minnesota, Wisconsin, Tennessee, and West Virginia are all higher than Altamont, based on fatalities per turbine per year. The GAO report further states: "Lack of comprehensive data on bird and bat fatalities from wind turbines makes it difficult to make national assessments of the impact of wind turbines on wildlife". The GAO report continues: "...relatively few postconstruction monitoring studies have been conducted and made publicly available. It appears that many wind power facilities and geographic areas in the United States have not been studied at all. For example, a bird advocacy group expressed concern at a recent National Wind Coordinating Committee meeting that most of the wind projects that have been monitored for bird impacts are in the west. The American Wind Energy Association reports that there are hundreds of wind power facilities currently operating elsewhere in the country. However, we were able to locate only 19 postconstruction studies that were conducted to assess direct impacts to birds or bats in 11 states. Texas, for example, is second only to California in installed wind

power capacity, but we were unable to find a single, publicly available study investigating bird or bat mortality in that state”.

Texas has since become the State with the largest number of wind turbines, and there is still not a single public report documenting wildlife impacts of wind projects in Texas.

Altamont Pass, therefore, is not singularly high in mortality of birds, but is actually below average. It is just better studied, and is larger than most wind projects. The mortality problem is nationwide, both for birds and for bats.

- (3) **Dr. Fry, in your testimony, you seem to object that large companies like General Electric now own and operate the new large emerging wind power farms? Would you feel better about this technology if they were small rather than large companies that made this investment?**

The wind industry was begun by small companies that were idealistic and truly wanted to develop energy resources that did not depend on fossil fuels. This idealism is the same force that has motivated scientists and the public to fight global climate change. I look forward to the day when giant energy corporations like BP and GE make just as strong a commitment to solving the problems of global warming. The size of a corporation owning or operating a wind farm does not matter. In my opinion, an important factor is the commitment to providing energy while minimizing impacts on the environment.

- (4) **Cats and high rise windows kill millions of birds each year. In fact, many times more than your estimates from wind turbines. What is your organization doing to combat the huge cat and window collision problem?**

American Bird Conservancy believes all the cumulative causes of mortality to birds should be addressed and reduced. Currently there are 223 species of birds in trouble, because their populations are steeply declining, and some of them will need the protection of the Endangered Species Act if the trends are not reversed. The Fish and Wildlife Service has identified these as “Species of conservation concern”, and the causes of population decline are generally uncertain.

American Bird Conservancy would like to request that the Committee on Natural Resources hold a hearing on the causes of decline of our native bird species, and take testimony on actions that might be taken to protect them. Birds are our most conspicuous wildlife, and the public has consistently supported efforts to protect birds.

Causes of bird mortality:

- Glass Buildings
- House cats
- Pesticides
- Habitat destruction and fragmentation
- Automobiles
- Utility power and transmission lines
- Communications towers
- Wind turbines
- Fishing gear, especially commercial long lines
- Lead fishing sinkers

Cats: American Bird Conservancy started the Cats Indoors campaign in 1997. The campaign is designed to educate cat owners, decision makers, and the general public that cats, wildlife and people all benefit when cats are kept indoors, in an outdoor enclosure, or trained to go outside on a harness and leash. ABC developed many education materials, including fact sheets, posters, the popular brochure, Keeping Cats Indoors Isn't Just For The Birds, an Educator's Guide for Grades K-6, print and radio Public Service Announcements (PSAs). Much more about the program is available on the ABC website at: <http://www.abcbirds.org/cats/> ABC has had a full-time director for the Cats Indoors! Campaign since 1997, and has worked with many State agencies, the Fish and Wildlife Service, and others to promote keeping cats indoors and safe. ABC has also conducted a program to work with feral cat colonies to prevent feral cats from killing threatened and endangered Piping Plovers along beaches in eastern States, and has worked with the Humane Society of the United States and other not for profit organizations to promote keeping cats indoors.

Windows: American Bird Conservancy (ABC) has a nationwide network of cooperating organizations in the Bird Conservation Alliance (BCA). The BCA Director, Alicia Craig, is a full-time ABC employee whose responsibility it is to coordinate programs with out conservation partners. One of the programs is FLAP—Fatal Light Awareness Program, a non-profit in Toronto, Canada. Another is Lights Out Chicago, which has been conducting a campaign to encourage large building owners

in Chicago to shut off lights at night. One of the strongest supporters of Lights out Chicago is a former Board Member of ABC.

- (5) Congressman Mollohan mentioned the “impacts on the natural beauty” of wind power facilities. How much should the Federal government regulate view impacts of Federally-permitted activities and projects? If you agree that the Federal government should, how would you create standards?**

I think regulating the “viewshed” should be a local, County or State responsibility, except in National Parks or on federal lands, where the agency overseeing the federal lands should work cooperatively with the local authorities. American Bird Conservancy does not have a policy on visual impacts of wind projects, because ABC’s concern is focused on the threats of wind projects on birds.

- (6) How many lawsuits have you or your organization filed against the Federal government in the last five years? Please elaborate on what issues the suits concerned and which agencies were the target of the lawsuit. Have you filed any related to wind power projects?**

American Bird Conservancy is not a litigious organization. We have always tried to work with parties responsible for harming birds, and to reach agreements voluntarily. ABC has only resorted to four lawsuits, two against communications towers killing birds: one in Hawaii affecting endangered Hawaiian birds and one in Mississippi in the major migratory flyway. ABC also filed suit against the Corps of Engineers for their attempt to destroy the largest breeding colony of Caspian Terns on Earth in the Colombia River Basin by removing a dredge spoil island. Subsequently the Corps has hired ABC in a contract to help them avoid destruction of Least Tern habitat. The last suit was against EPA to stop the use of the pesticide Fenthion for mosquito abatement in Florida following the documented killing of more than 300,000 birds, including endangered Piping Plovers. EPA subsequently has supported the creation of an ABC pesticide database.

- (7) Do you or any members of your organization serve on any Federal advisory panels or committees as a representative of your organization?**

Yes, I serve on two FACA committees currently, and have served on special scientific panels for EPA and the National Research Council of the National Academy of Sciences.

Current Participation:

EPA: Pesticide Program Dialog Committee 2005-present

U.S. Dept. Interior Minerals Management Service Science Advisory Committee 2006-present.

Former Participation:

U.S. Environmental Protection Agency (EPA), Ecological Committee on FIFRA Risk Assessment Methods, 1997-1999

U.S. Environmental Protection Agency, Science Advisory Panel for refined terrestrial and aquatic models, probabilistic risk assessment for pesticides. 2004

U.S. National Academy of Sciences, National Research Council: Panel on Hormone Related Toxicants, 1995-1999

- (8) Do you, your organization, or any of the officers or full time employees of your organization receive any Federal grants, contracts or other funds? If so, please elaborate.**

The list of federal grants is included in my disclosure statement which has been attached.

[NOTE: The document, “Wind Turbine Interactions with Birds and Bats: A Summary of Research Results and Remaining Questions”, November 2004, published by the National Wind Coordinating Committee, has been retained in the Committee’s official files.]

**American Bird Conservancy
Federal Awards
For the Years 10/1/2000-3/31/2007**

<u>Grantor/Program Title</u>	<u>Date</u>	<u>Grant Amount</u>
United States Department of Interior		
United States Geological Survey - Research Database	2001	\$ 5,000
United States Geological Survey - No. American Colonial Waterbird Plan	2002	\$ 17,500
United States Geological Survey - Climate Change & Grassland Birds	2000-2003	\$ 111,400
	10/2000-	
United States Geological Survey - Point Count Survey	12/31/2001	\$ 87,297
United States Geological Survey - Avian Monitoring in Oregon and Washington	2000-2001	\$ 9,006
United States Fish & Wildlife Service - Partners in Flight Support	2000	\$ 26,500
United States Fish & Wildlife Service - Grassland Birds	2002	\$ 6,600
United States Fish & Wildlife Service - Study on Grassland Birds	2003	\$ 4,400
United States Fish & Wildlife Service - Study on Grassland Birds	2004-2005	\$ 5,610
United States Fish & Wildlife Service - Central Hardwood Bird Cons. Support		
Subgrant from Wildlife Management Institute	2001	\$ 20,000
Subgrant from National Wildlife Foundation	2001	\$ 15,000
United States Fish & Wildlife Service - Central Hardwood Bird Cons. Support	2003-2006	\$ 45,000
United States Fish & Wildlife Service - Central Hardwood Joint Venture	2005-2007	\$ 157,877
United States Fish & Wildlife Service - NMBCA - Migratory Bird Cons. Alliance	2005-ongoing	\$ 46,500
United States Fish & Wildlife Service - NMBCA - Migratory Bird Cons. Alliance	2006-ongoing	\$ 26,069
United States Fish & Wildlife Service - International, NABCI, Policy Council	2000	\$ 10,000
United States Fish & Wildlife Service - International, NABCI, Policy Council	2001	\$ 10,000
United States Fish & Wildlife Service - International, NABCI, Policy Council	2003	\$ 7,500
United States Fish & Wildlife Service - Neotropical Migratory Bird Conservation Act (NMBCA)- ReCovering Paradise Project	2003-2005	\$ 100,000
United States Fish & Wildlife Service - NMBCA - Colombia	2004-2005	\$ 41,108
United States Fish & Wildlife Service - NMBCA - Andes	2006-ongoing	\$ 78,729
United States Fish & Wildlife Service - NMBCA - Dominican Republic	2006-ongoing	\$ 45,152
United States Fish & Wildlife Service - Atlantic Coast Joint Venture (ACJV) - Partners in Flight Physiographic Plan Support	2002-Present	\$ 101,725
United States Fish & Wildlife Service - Neotropical Migratory Bird Conservation Act - Querques and Aves Habitat Protection Project	2003-2005	\$ 227,470
United States Fish & Wildlife Service - Neotropical Migratory Bird Conservation Act - Querques and Aves Habitat Protection Project	2006-ongoing	\$ 8,150
United States Fish & Wildlife Service - No. Pacific Rainforest Bird Conservation Coord. Support and Support of the Cascades Birding Trail	2002-ongoing	\$ 35,000
United States Fish & Wildlife Service		
Subgrant from Ducks Unlimited - Pacific Coast Joint Venture	2004-ongoing	\$ 61,000
United States Fish & Wildlife Service - NMBCA		
Subgrant from WolfTree, Inc.	2004-2006	\$ 15,000
United States Fish & Wildlife Service - Federal Grant In Aid		
Subgrant from Oregon Department of Fish and Wildlife	2004-2006	\$ 15,000
United States Geological Survey - Intermountain West Monitoring	2005-2006	\$ 23,000
United States Fish & Wildlife Service - Non-Game Bird Conservation Planning for the Prairie Pothole Joint Venture	2002	\$ 13,277
United States Fish & Wildlife Service		
Subgrant from Tennessee Wildlife Resources Agency		\$ 33,750
United States Fish & Wildlife Service - International Small Grants Program	2001	\$ 16,800
United States Fish & Wildlife Service - International Small Grants Program	2002	\$ 25,000
United States Fish & Wildlife Service - International Small Grants Program	2003	\$ 16,000
United States Fish & Wildlife Service - International Small Grants Program	2004	\$ 10,000
United States Fish & Wildlife Service - International Small Grants Program	2006	\$ 5,000
United States Fish & Wildlife Service - No. American Colonial Waterbird Plan	2002	\$ 7,000
United States Fish & Wildlife Service		
Subgrant from American Forest Foundation - Restoring Longleaf Pine	2003	\$ 10,500
United States Fish & Wildlife Service		
Subgrant from Ducks Unlimited - No. Rockies Bird Cons. Coord. Support	2003-ongoing	\$ 83,522
Subgrant from Ducks Unlimited - GIS Work in the Intermountain West Joint Vent.	2003-ongoing	\$ 125,686
United States Fish & Wildlife Service - Bighole NWR - Bird Monitoring	2003	\$ 4,081
United States Fish & Wildlife Service - Conservation of Poleyepis Forests	2003	\$ 11,070
United States Fish & Wildlife Service - Multi-state Grant	2006-ongoing	\$ 143,191
United States Fish & Wildlife Service		
Subgrant from National Fish & Wildlife Foundation (NFWF) - Cats Indoors! Program	2002-2003	\$ 30,000
Subgrant from National Fish & Wildlife Foundation (NFWF) - Cats Indoors! Program	2004-2005	\$ 35,000
Subgrant from National Fish & Wildlife Foundation (NFWF) - Cats Indoors! Program	2006	\$ 35,000
Subgrant from NFWF - Madison/Missouri River Project		\$ 16,638
Subgrant from NFWF - Oregon Birding Trail	2003	\$ 5,000
Bureau of Land Management - No. Pacific Rainforest Bird Cons. Coordinator Support	2001-2006	\$ 50,000
Bureau of Land Management - Cascades Birding Trail	2003	\$ 5,000

Ms. BORDALLO. Thank you very much for your testimony, Dr. Fry, and the Chair now recognizes Mr. Glitzenstein. You are now recognized to testify for five minutes.

**STATEMENT OF ERIC R. GLITZENSTEIN, PARTNER,
MEYER GLITZENSTEIN AND CRYSTAL**

Mr. GLITZENSTEIN. Thank you, Madam Chairwoman, Chairman Rahall, and Members of the Subcommittee.

My perspective on this comes from my work in a public interest law firm where we represent nonprofit conservation organizations, including organizations like Friends of Black Water, an organization within the State of West Virginia that has done significant work on the wind power issue, and in that connection we have followed very carefully a number of the wind projects that have been going on, and the ones that are currently, or are in the planning stage.

We also brought a Freedom of Information in that case on behalf of Friends of Black Water against the Fish and Wildlife Service to obtain documents reflecting the Service's approach to enforcement, or as the case may be, non-enforcement of the Federal wildlife laws and what that pattern of non-enforcement might in fact be based upon.

What we have learned over the course of time I think is actually what a number of other members of the Subcommittee and witnesses have already testified to, and that is that we do not have a current coherent, comprehensive policy for addressing the potential adverse impacts on wildlife and other environmental values.

Most of the protections to this date have been laid at the doorstep of local and state permitting agencies. The reality is that those agencies are in no position whatsoever to address impacts on national, indeed international resources like migratory birds, and I think the most obvious way of looking at that is they don't even have jurisdiction over the cumulative impact issue which really only a national entity like the Fish and Wildlife Service can take any kind of coherent approach to.

If you look at the major Federal wildlife laws, each of them has proven to be fundamentally inadequate for I think what have turned out to be fairly obvious reason. The Endangered Species Act only comes into play when there is a listed and endangered threatened species. Even in that situation, the Fish and Wildlife Service has an enormous problem even obtaining access to the sites. Unless the owner of the plant allows the Service on the site, the Service may not even be able to determine that, in fact, this is the habitat of a listed species, and the protections of that one never come into play.

National Environmental Policy Act only applies when there is already some other Federal licensing or funding at work, and even then it is only a procedural statute. There could be acknowledgment that there are massive wildlife impacts, and yet there is no substantive obligation under that law to do anything about them.

The Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act would appear to be the most obvious statutes for addressing these problems, but the reality is that there are fundamental flaws in how those statutes have been enforced.

A critical thing to realize is that, unlike many other environmental laws such as the Endangered Species Act, there is no citizen enforcement mechanism within those statutes. Endangered Species Act, citizens, if they believe a species is being illegally taken, can go to court and seek some kind of prospective enforcement. That is not possible under those statutes. As a consequence, enforcement is entirely left up to the Fish and Wildlife Services. If it does not enforce the law, essentially the law goes completely unimplemented.

We found out when we did our Freedom of Information Act case that many of the line officers within the Fish and Wildlife Service have documented repeated violations. Dr. Fry gave the overall statistics. Let me give you an example of one of the reports and what it said.

It says that migratory bird mortalities at the wind farms usually occur by the birds being dismembered when they come into contact with the fully exposed spinning turbine blades, and that ‘One particular Golden Eagle was found in four separate pieces with the left wing and one leg so badly twisted together they could not be readily separated.’”

It went on to say that other types of injuries documented over the decades include severed beaks resulting in massive hemorrhage, decapitations, midskull or complete fractures, midbody separation. So just to give some concrete sense as to what we are talking about, these are massive ongoing impacts on migratory birds, yet there has been no enforcement as people have already testified to.

What we are recommending and what I have suggested in my testimony is three specific measures. One, an obligation to engage in a cumulative impacts analysis and to adopt measures that would bring that cumulative impacts perspective to bear on wind operation siting decisions.

Second, I think the Subcommittee should seriously consider adding a citizen enforcement mechanism to the Migratory Bird Treaty Act. That is in many other environmental statutes. There is no coherent reason why it should not be brought up to date with respect to that statute and the Bald and Golden Eagle Protection Act.

And third, basic elementary standards for monitoring pre-construction surveys and adaptive management as you have with nuclear power, hydro-electric facilities, the whole range of energy production facilities. No reason why that should not also be done with respect to wind power, we respectfully submit.

I would be happy to answer any questions.

[The prepared statement of Mr. Glitzenstein follows:]

Statement of Eric R. Glitzenstein, Meyer Glitzenstein & Crystal

I appreciate the opportunity to testify before the subcommittee on the vitally important topic of the impact of wind turbines on wildlife, particularly migratory birds and bats. I am a partner with the Washington, D.C. public-interest law firm Meyer Glitzenstein & Crystal, which provides legal representation to non-profit environmental, conservation, and animal protection organizations. I am also the President of the Wildlife Advocacy Project, a non-profit organization dedicated to assisting grassroots activists in their efforts to educate the public concerning threats to wildlife. A brief Biographical Statement is being provided.

As requested by the subcommittee, my testimony will focus on the current legal and regulatory framework that applies to the impact of wind turbines on wildlife.

As discussed below, while a number of federal environmental laws may come into play when wind turbines are being planned and constructed, there is, at present, no comprehensive, effective federal system for avoiding, minimizing, and mitigating the effects of wind power projects on migratory birds, bats, and other wildlife. In addition, some of the most important regulatory and legal tools that are available depend entirely on the willingness of officials in the Department of the Interior to threaten or bring appropriate enforcement actions. Because such officials have demonstrated that they are completely unwilling to bring such actions, even in the face of flagrant violations of federal laws, wind power companies have little incentive to avoid or minimize impacts on wildlife, including federally protected species.

Before turning to these issues in greater detail, it is important to stress that wind power facilities, if properly sited, constructed, and monitored, can and should be a part of the answer to the global climate change crisis. At the same time, strenuous efforts must be made to avoid creating new ecological crises in the name of solving an existing one. By the same token, the fact that wind power may prove to be a piece of our energy puzzle does not mean that the wind power industry should get a free pass when it comes to safeguarding wildlife and other natural resources. Nor does it mean that the industry should have blanket immunity from federal environmental laws. Just as the nation would not tolerate the nuclear, oil, or coal industries asking to be relieved of all obligations to protect wildlife and other resources, nor should that be an acceptable outcome for the wind power industry. As in most situations, it is crucial to find the appropriate balance between encouraging the construction of wind turbines in appropriate locations while, at the same time, ensuring that common-sense protections for wildlife are adopted and satisfied. After explaining the current untenable situation, my testimony will suggest appropriate legislative solutions for striking that balance.

THE INADEQUACY OF CURRENT CONSERVATION LAWS AND REGULATORY SYSTEMS TO ADDRESS THE ADVERSE IMPACTS OF WIND POWER PROJECTS ON WILDLIFE

To date, the federal government has played an extremely limited role in ensuring that wind turbines are sited and constructed in an environmentally sound and sustainable fashion. At present, all that is required for most wind power projects to begin construction and operation is a permit from the relevant state or local public service commission. These agencies have neither the expertise, the incentive, nor the legal mandate to fully evaluate the impact of wind power projects on wildlife and other natural resources. Most important, state and local agencies cannot reasonably be expected to evaluate, let alone to act upon, the potential cumulative effects of projects over which they have no jurisdiction—particularly impacts to migratory birds, which are a uniquely national (indeed, international) resource.

On the other hand, while several federal conservation laws may be used to reduce the impacts of wind turbines on birds, bats, and other wildlife under some circumstances, each of these statutes has proven to have severe limitations and deficiencies in addressing this issue. Taken together, they fall woefully short of the sort of comprehensive protection that will be necessary, particularly if wind power projects expand at the exponential rate presently being projected.

The Endangered Species Act only affords protections to the relatively few species that have been formally listed as endangered or threatened. Under the best of circumstances, it generally takes years to persuade the Fish and Wildlife Service (“FWS”) to list a new species. Accordingly, while the ESA has afforded some vital protections to listed species like the Indiana bat and Northern flying squirrel (which the FWS is now proposing to delist on highly dubious legal and factual grounds), it provides no protection at all for the vast majority of birds and bats that are killed, injured, and harassed by wind turbines. And even for listed species, the ESA can be a crude instrument for protecting wildlife from wind turbines. If projects are not being built on federal lands—as is the case with most projects—the FWS has no legal authority to secure access to sites even to ascertain whether listed species are present in the area, let alone to insist that siting or construction changes be made to protect such species. Accordingly, although the ESA makes it unlawful for any power company to build a turbine that kills, injures, or harms a listed species—including, in some circumstances, through habitat destruction—the companies presently have a perverse incentive to remain ignorant regarding such impacts and hoping that the safeguards of the ESA never come into play.

The National Environmental Policy Act (“NEPA”) requires all federal agencies to analyze—in Environmental Impact Statements—the environmental impacts of “major federal actions significantly affecting the quality of the environment.” However, where—as is the case with most wind power projects—there is no necessary federal approval or other agency action, the EIS requirement is not triggered.

Moreover, even where NEPA applies, the statute is purely procedural, i.e., the NEPA analysis could disclose that a project will have massive adverse impacts on a project that involves federal action (such as a project being build on national forest land, or with federal funding), but NEPA would not prevent the project from going forward.

On their face, the two federal statutes with the greatest potential to ameliorate the adverse effects of wind turbines are the Migratory Bird Treaty Act ("MBTA") and the Bald and Golden Eagle Protection Act ("BGEPA"). The MBTA, which implements various treaties between the U.S. and other countries to protect migratory birds, makes it "unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird protected by the treaties. Any person who "kills" or "takes" a migratory bird in violation of the Act may be fined or even imprisoned for up to six months. Similarly, the BGEPA generally prohibits the taking, wounding, killing, or disturbing of bald and golden eagles—species that are also protected by the MBTA—and provides for criminal penalties when there is "wanton disregard for the consequences" of actions on eagles. In addition, civil enforcement actions may be brought by the government even when there is harm but no intent to harm eagles.

Unfortunately, while these statutes should be of enormous value in addressing the adverse effects of wind turbines on birds, their actual benefit has been negligible at best. This is because of two related problems—first, neither the MBTA nor the BGEPA contains a "citizen suit" provision; accordingly, citizen enforcement of the statutes directly against wind projects that are killing and injuring protected birds is, at present, legally impossible. Second, although enforcement of these statutes against private violators is entirely dependent on the willingness of federal officials to bring, or at least threaten, actions for civil or criminal penalties, Interior Department and other federal officials have consistently refused to do so with respect to wind turbines, although they have known for decades that these projects may—if not properly sited and constructed—result in rampant violations of the MBTA and BGEPA.

Unlike the Endangered Species Act and most other modern environmental laws—such as the Clean Water Act, Clean Air Act, and Toxic Substances Control Act—neither the MBTA nor BGEPA authorizes citizens to bring enforcement actions against statutory violators. Indeed, "citizen suit provisions are now fixtures in the landscape of federal environmental law," Fadil, *Citizen Suits Against Polluters: Picking Up the Pace*, 9 Harv. Env. L. Rev. 23, 24 (1985), precisely because Congress has repeatedly recognized that the enforcement of environmental laws will be lax to nonexistent unless vigilant and concerned citizens are empowered to bring suit.

That has certainly been the case with wind power projects. Interior Department officials have known since the early 1980's—when wind turbines were installed in the Altamont Pass in California—that such projects have the potential to maim, dismember, and otherwise destroy eagles, hawks, owls, falcons, and many other bird species. Indeed, in disturbing documents my firm obtained in a Freedom of Information Act lawsuit on behalf of Friends of Blackwater—a West Virginia conservation group—FWS enforcement officers documented that even single turbines were killing, every month, hundreds of such birds in the most horrific manner imaginable.

For example, according to one internal "Report of Investigation" documenting "Violations of the Migratory Bird Treaty Act" and "Violations of the Eagle Act," the report explains that "[m]igratory bird mortalities at the wind farms usually occur by the birds being dismembered when they come into contact with the fully exposed spinning turbine blades," and that one "particular Golden eagle was found in four separate pieces," with the "left wing and one leg [] so badly twisted together, they could not be readily separated." According to the Report, other "[t]ypes of injuries observed are: severed beaks resulting in massive hemorrhage; decapitations, either mid-skull or complete; complete mid-body separation; wing amputations or fractures." (A copy of this Report and several similar internal FWS investigatory records are being submitted along with this testimony for the convenience of the Subcommittee). The Report also documented many "electrocution mortalities," while stressing that "[m]ost migratory bird electrocutions are preventable using current technology."

Yet although such killing and injuring of eagles, hawks, and other birds has now been going on for decades and this constitutes a patent violation of the MBTA and the BGEPA, federal officials have never even initiated civil or criminal enforcement actions against any of the Altamont (or any other) facilities. Unfortunately, the same pattern of official abdication of enforcement responsibilities is now being repeated on the East Coast. For example, soon after a 44-turbine project called the Mountaineer Wind Energy Center became operational in December 2002 in the West Virginia Appalachian highlands, dozens of migrating songbirds—including

blackpoll, magnolia, and Canada warblers and other species on the FWS's list of migratory birds of "special concern"—were killed in a single night after colliding with turbines during foggy conditions characteristic of the Appalachian ridges. Once again, although this was the largest single bird kill ever recorded at a wind power facility in the U.S., Interior Department officials again took no enforcement action against the company for this flagrant violation of the MBTA.

It has become painfully apparent that, without further direction from Congress, the situation facing wildlife will become even more ominous as Interior Department officials adhere to their "hands off" policy. Indeed, in an effort to prompt a change in approach, in June 2003, over thirty national and regional conservation groups—including Defenders of Wildlife and the National Audubon Society—along with concerned scientists and citizens wrote to the Secretary of the Interior and the Director of the FWS urging them to exercise their authority under the MBTA to take "immediate steps to ensure that appropriate biological information is gathered and considered before an expansive series of large-scale wind power projects is constructed throughout the Appalachian Mountain ridges, with potentially devastating and irreversible impacts on the hundreds of migratory bird species that funnel through those ridges each year." The conservation groups and scientists urged the Interior Department to establish appropriate siting and construction criteria and, equally important, in order to "ensure that these criteria are followed by the wind power industry," to "us[e] the threat of MBTA enforcement as leverage if necessary, so that illegal "takes" of migratory birds are avoided or minimized."

In a September 2003 response, the Department made clear that it had no intention of enforcing the MBTA or even using the threat of such enforcement to ameliorate the impact of wind turbines. Thus, while acknowledging that "impacts on birds, bats, other wildlife, and [] disruption and fragmentation of habitats are of concern," the Department stated that it would merely "encourage" compliance with "voluntary" siting and monitoring "guidelines," and that it hoped that a "spirit of partnership and cooperation" would prompt power companies to comply with the guidelines. In other words, the Department made clear that it would continue to rely on the same laissez-faire approach that has already proven to be woefully inadequate in preventing bird kills at the Altamont pass and other wind turbines.

Finally, as bad as the present regulatory situation is for birds, it is, if possible, even worse for bats. Except for the few bat species that are presently listed as endangered or threatened, bats have no substantive protection under any federal conservation law, although the projected wind facilities may well decimate bat populations. The FWS has estimated that the Nedpower Mount Storm Wind Project in West Virginia could alone "kill approximately 9,500 bats a year," which is a "significant level of fatalities which local populations would have a difficult time sustaining." (9/15/07 letter from FWS West Virginia Field Office to Newpower).

Likewise, scientists with Bat Conservation International ("BCI") found that 66 turbines at two wind power sites in West Virginia and Pennsylvania killed as many as 2,900 bats in just a six-week study period—an alarming rate that the organization said was simply not "ecologically sustainable." Yet FPL Energy—which owns the plants—renewed on a commitment to allow further monitoring of bat impacts because it might put pressure on the company to shut down turbines. In the absence of further legal safeguards, it is inevitable that bat populations will be decimated by the ever-expanding wind power operations, and that additional bat species may eventually have to be listed as endangered or threatened as a direct result of wind power.

In sum, there are, at present, gaping holes in the protection of wildlife—and birds and bats in particular—from poorly sited, constructed, and monitored wind turbines. While migratory birds are ostensibly protected by the MBTA and BGEPA, that protection has proven illusory because federal officials simply refuse to enforce those statutes against even the most egregious violations in connection with wind turbines. Except for a handful of listed bat species, bats lack even theoretical protection under federal law. And, even in the rare instances where federal regulatory tools are being brought to bear on individual projects—such as projects on federal lands or where the FWS knows that an endangered or threatened species is present—no agency is even evaluating the cumulative effects of present and planned wind turbines on at-risk wildlife species, let alone incorporating such analysis into a precautionary regulatory regime. Accordingly, in the absence of further federal safeguards, it is inevitable that the nation will, perversely, wind up creating a new ecological crisis in the guise of addressing another one. Now is clearly the time for Congress to act, before it is too late.

PROPOSED LEGISLATIVE RESPONSE TO THE LOOMING WILDLIFE CRISIS POSED BY EXPANDING WIND TURBINES

Fortunately, relatively modest measures can afford wildlife invaluable protections, while still allowing wind power projects to expand into ecologically appropriate locations.

First, Congress should require the FWS, based on recommendations of an independent committee of scientific experts (i.e., experts who have not served as consultants for, and have no other financial connection with wind power companies) to (1) evaluate the likely cumulative effects of present and planned wind turbines on birds, bats, and other wildlife populations, and (2) devise appropriate measures for minimizing and mitigating such cumulative effects to the greatest extent practicable. A temporary moratorium on the construction of new turbines should be imposed while this analysis—which could probably be completed within six to twelve months—is conducted.

Second, Congress should amend the MBTA by authorizing citizens to bring appropriate enforcement actions for violations of the statute. There is no sensible policy reason why citizens should be able to enforce the ESA and other major environmental laws, but may not do so with regard to MBTA violations; rather, the lack of a citizen suit provision is merely an historical artifact, i.e., the MBTA was enacted long before it became routine for Congress to look to citizen enforcement as a critical supplement to enforcement efforts by perennially underfunded and frequently indifferent federal officials. A citizen suit provision in the MBTA could be modeled after the ESA's citizen suit provision (section 11(g) in that Act), which has generally worked well in helping to curb egregious violations of that law.

Third, Congress should require the FWS to adopt, following public notice and comment procedures, mandatory siting, construction, monitoring, and adaptive management standards that are designed to avoid, minimize, and mitigate wildlife (and particularly bird and bat) impacts, and with which all wind turbines must comply. These standards should be informed by and consistent with the cumulative impacts analysis conducted by the FWS and independent scientists. Many such standards could parallel the voluntary “guidelines” on which the FWS is now relying and which are sound in principle but largely ignored by the wind power industry—which, once again, has no incentive to comply with such guidelines and concrete financial reasons not to do so.

Turbines should not be permitted to operate unless the FWS expressly certifies that they are in compliance with the standards; to ensure that they remain in compliance, such certifications should be renewed periodically. In addition, as with other major energy facilities—such as nuclear and hydroelectric plants—the public should have an opportunity to comment on the adequacy of a company's plans for complying with standards designed to avoid, minimize, and mitigate environmental impacts.

For example, as with the present guidelines, such standards should provide that turbines must be sited so as to minimize wildlife impacts, including by avoiding ecologically sensitive areas such as known bird migration routes, wetlands where birds and other wildlife are known to congregate, and all hibernation, breeding, and maternity/nursery colonies of bats. In addition, turbines should be sited and configured so as to avoid landscape and other features that are known to attract wildlife (e.g., because eagles, falcons, and other raptors are known to use cliffs and ledges for perching, turbines should be set back from such features).

To ensure that appropriate information is brought to bear on such siting and configuration decisions, the standards should require comprehensive pre-construction site surveys that are of sufficient scope and duration to reasonably evaluate the extent to which a particular site is used by migratory birds, bats, and other wildlife. Congress should make clear that the FWS has authority to oversee all such surveys and, of critical importance, to obtain access to all sites under consideration so that the Service can evaluate for itself the value of a particular site for wildlife.

Consistent with the present voluntary guidelines, mandatory standards should also require wind companies to monitor impacts of turbines on wildlife, to ensure that predictions of acceptable impact are not exceeded. All monitoring plans should be approved by the FWS, and all data produced as a result of the monitoring efforts should be made available to the Service and, in turn, the public. Where monitoring reveals that turbines are exceeding anticipated wildlife impacts, the standards should require that adaptive management measures be brought to bear to reduce such impacts to the “baseline” conditions predicted by the turbine operator. Where companies fail to comply with the standards for siting, constructing, monitoring, and reducing unanticipated impacts, both the FWS and interested citizens should be authorized to bring appropriate enforcement actions to ensure such compliance.

With regard to turbines already in existence, while it may be impractical to relocate them, they should not be relieved of all obligations to monitor for wildlife impacts, and to make appropriate technological and other adjustments to reduce such impacts. Accordingly, Congress should direct that the FWS should adopt specific standards—again, with public notice and comment—regarding the appropriate means to minimize and mitigate impacts at turbines already in operation. Because impacts on bats have already proven to be an enormous concern at such facilities, Congress should make clear that the standards should specifically focus on appropriate measures for reducing such impacts, including by requiring plant operators to retrofit turbines with newly available technologies for reducing impacts and/or to compensate for them by, e.g., offsetting any unavoidable impacts by purchasing and preserving in perpetuity mitigation habitat. Of course, all such turbines should remain fully subject to preexisting conservation laws, such as the ESA and MBTA.

If common-sense measures such as these are adopted to conserve precious wildlife resources, wind power will be worthy of the “green energy” and “environmentally friendly” labels that its promoters and supporters use to describe it. Without them, those labels will, over the coming years and decades, be increasingly viewed as tragically ironic, as birds, bats, and other wildlife are needlessly killed and maimed in ever-increasing numbers.

May 25, 2007

By Electronic Mail

Madeleine Z. Bordallo
 Chairwoman, Subcommittee on
 Fisheries, Wildlife and Oceans
 Committee on Natural Resources
 U.S. House of Representatives
 Washington, D.C. 20515

Re: Responses to Follow-Up Questions for May 1, 2007 Oversight Hearing on Wind
 Turbines and Wildlife Impacts

Dear Chairwoman Bordallo:

Thank you for the opportunity to testify at the May 1, 2007 hearing on the impacts of wind turbines on birds and bats. The following are my answers to the follow-up questions from Rep. Brown. Where a question has several different parts to it, I will answer each part in individual paragraphs.

1. It is correct that a principal reason why the federal government has played an extremely limited role on this issue is because most wind projects have been sited on non-federal lands. However, certain federal environmental statutes come into play even where projects are not built on federal lands. For example, the Migratory Bird Treaty Act broadly makes it unlawful for any person to kill a migratory bird without authorization. The Endangered Species Act makes it unlawful for any person to kill or otherwise “take” members of a listed species without a permit. Accordingly, another central reason for why the federal government has played a limited role with regard to the adverse impacts of wind power projects on wildlife is that there has been woefully inadequate enforcement of the federal environmental laws that do apply to such projects on non-federal lands.

I am not proposing that the federal government replace state and local entities in all siting decisions. Rather, I am suggesting that where uniquely national resources are at stake—such as migratory birds and bat populations that overlap state boundaries—and where states are not, and cannot be expected to, address impacts that transcend individual state concerns (such as cumulative effects on wildlife populations that will be impacted by projects in multiple states) federal regulations are necessary and appropriate to address and mitigate environmental impacts. This is not a radical concept. As mentioned in my testimony, the federal government establishes minimum siting and other standards for nuclear power plants, hydroelectric facilities, and other energy projects. There is no reason why the federal government should not play a similar role with regard to wind power projects.

2. I am not suggesting that states do not care about their wildlife. Indeed, some states have done extremely well in managing wildlife populations, while others do not have as strong a record. However, as suggested in my answer to the first question, no state agency can be expected to address impacts on interstate wildlife resources such as migratory bird populations. For example, the State of Maryland—where a number of wind projects are being built and/or proposed—has neither the legal jurisdiction nor the expertise to address the cumulative impacts of multiple

projects in various states on migratory bird populations. Only a federal agency—such as the U.S. Fish and Wildlife—has the capacity and expertise to address such impacts.

While I cannot provide examples of where states have failed to enforce their own wildlife laws, the problem with wind power projects is that states simply do not have wildlife laws that are adequate to address the problems now being experienced. For example, I am not familiar with any state law that makes it unlawful for a wind power project to kill a large number of bats. Indeed, if such laws existed, we would not be seeing bat kills of the magnitude now being experienced and projected. Accordingly, while state laws are sufficient to address some kinds of wildlife problems, the national development of wind power clearly calls for a national solution to ameliorate adverse wildlife impacts that are plainly not being adequately addressed by state agencies.

3. My public-interest law firm regularly brings lawsuits against federal agencies for failing to enforce federal environmental statutes. I have been lead counsel in approximately 10 such cases in the last five years and have been co-counsel in many other such cases. We do not receive any federal taxpayer money as up-front “compensation” for bringing such cases. Some of the statutes under which we bring suit—such as the Endangered Species Act and the Clean Water Act—provide that “prevailing parties” may recover attorneys’ fees awards when the Court deems it appropriate. Congress included such provisions for the precise purpose of encouraging private enforcement of federal environmental laws. When fees are awarded in cases brought by my firm they are used primarily to reimburse the non-profit conservation organizations we represent.

An example of a lawsuit I have brought recently is a case pursued on behalf of Save the Manatee Club and 18 other conservation and animal protection organizations to address the large numbers of manatees that are killed and maimed by power boats. The lawsuit was brought against the U.S. Army Corps of Engineers (which gives federal permits for projects that increase power boat access to manatee habitat) and the U.S. Fish and Wildlife Service. The lawsuit resulted in a settlement that has significantly increased the number of manatee sanctuaries and refuges in Florida. I have brought many other lawsuits to gain and increase protection for imperiled species under the Endangered Species Act; some species that have benefitted from such lawsuits include the Canada lynx, the Wood stork, the Right whale, and the Grizzly bear. I have represented both national conservation and animal protection groups (such as Defenders of Wildlife, the Sierra Club, and the Humane Society of the U.S.) and grassroots groups (such as the Florida Biodiversity Project and Friends of Blackwater, a West Virginia organization). A docket of the past and pending cases of Meyer Glitzenstein & Crystal can be found at www.meyerglitz.com.

The only lawsuit my firm has filed related to wind power projects is a Freedom of Information Act case to obtain documents from the Interior Department shedding light on why the Service has failed to enforce laws such as the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act against wind power projects that are violating these laws. As mentioned in my testimony, that lawsuit resulted in the release of documents demonstrating that there have been rampant legal violations in connection with wind power projects, and yet no enforcement actions have ever been brought by the federal government to curtail such violations.

4. Reasonable efforts should be made to minimize the numbers of birds killed by all causes. More pertinent to the topic at hand, however, the fact that bird populations are already being decimated by many different sources is a compelling reason to take modest precautionary steps to ensure that wind power does not become one more lethal blow to populations that are already suffering greatly. Otherwise, as a society, we will have learned nothing from past experience. For example, only after many communications towers were built did it become apparent that such facilities were killing millions of birds. Why would we, as a society, want to repeat such a “leap before we look” approach with wind power projects instead of now adopting modest measures for siting, constructing, and monitoring projects so that we can both benefit from properly sited and built projects and avoid unnecessary impacts on birds, bats, and other wildlife? We teach our children that an “ounce of prevention is worth a pound of cure.” It is also a good adage on which to base federal wildlife policy.

It is also important to recognize that simply comparing total numbers of bird impacts from different sources is a misleading comparison because different species of birds are killed in disproportionately high numbers by different kinds of sources. For example, wind power projects built along Appalachian ridges will have a disproportionately high impact on bald eagles, golden eagles, falcons, and hawks who fly over these ridges while migrating. Thus, for example, while cars and trucks may kill more birds in total, wind power projects may have a particularly devastating

cumulative impact on eagles and other raptors—as has happened at the Altamont Pass Wind Facility in California. For this reason as well, it makes little sense to conclude that wind power projects should go largely unregulated by the federal government because many birds die from other causes.

I and others have brought lawsuits to address adverse impacts on birds from other sources. For example, I am presently involved in litigation concerning the impacts of limestone mining on Everglades wetlands used by Wood storks and many other bird species. Recent cases brought by other environmental attorneys have focused on the adverse impacts of pesticides on endangered birds and other wildlife. But at the same time, it is far better public policy to put reasonable protections in place before the fact so that such lawsuits are unnecessary. Congress has that opportunity with wind power projects.

5. To begin with, the problem posed by the Altamont Pass Wind Facility highlights the importance of making informed siting and construction decisions before the turbines are built. Once they are built—as at Altamont—options are obviously more constrained. That experience should not be repeated on the East Coast. Because I am not a scientist or engineer, I am reluctant to provide specific recommendations on the best way to deal with the ongoing killing and injuring of eagles, hawks, and other birds at Altamont. It is my understanding that there are available technological “fixes” that can be used to significantly reduce some of the sources of mortality (such as electrocutions), while others may prove more intractable. If there are ongoing impacts that cannot be adequately ameliorated through retrofitting of equipment or other technological fixes, turbines should be shut down if there is to be compliance with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These laws—and the treaties on which they are based—flatly forbid the killing or injuring of eagles, hawks, and other migratory birds, and basic respect for the rule of law, to say nothing of the interest in wildlife protection, demands that wind project operators should not be permitted to simply violate the law with impunity.

6. While I do not believe that the aesthetic impact of a wind power projects is the most important environmental consideration, it is certainly a legitimate concern when it comes to siting federally-approved projects. Many of our nation’s “special places”—such as national parks, monuments, forests, and refuges—have been set aside precisely so that they may afford opportunities to the public for quite contemplation and enjoyment of the natural splendor and unspoiled beauty that make our country such a unique place. Accordingly, if wind power projects—or any other project for that matter—can be sited in such a way as to avoid or minimize marring an otherwise unblemished view of a mountain, shoreline, or other special natural place, then such considerations should indeed help guide siting decisions.

As for the creation of appropriate federal “standards” concerning aesthetic impacts, they should be based on the reasonable principle that, where feasible, unspoiled areas should be avoided and areas that already have, as part of their “baseline” condition, other industrial activities should be the preferred locations for wind projects. This is already a standard concept in evaluations under the National Environmental Policy Act, the Endangered Species Act, and other federal environmental laws, and it should also be applied in the wind power context.

Sincerely,

Eric R. Glitzenstein

Ms. BORDALLO. Thank you very much, Mr. Glitzenstein, and now Mr. Daulton. I appreciate your patience in waiting to go last, and the floor is yours to testify for five minutes.

**STATEMENT OF MICHAEL DAULTON, DIRECTOR OF
CONSERVATION POLICY, NATIONAL AUDUBON SOCIETY**

Mr. DAULTON. Thank you, Madam Chairwoman, and I am happy to demonstrate my patience as I begin my testimony.

My name is Mike Daulton, and I am Director of Conservation Policy for National Audubon Society. Thank you for the opportunity to testify today regarding the impacts of wind power on migratory birds, bats and other wildlife.

National Audubon Society has 24 state offices, and more than 500 local chapters throughout the United States, serve more than 1 million members and supporters. Our mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife and their habitats for the benefit of humanity and the earth's biological diversity.

Audubon has an extensive history of involvement in wind-wildlife interaction issues, including efforts to develop state guidelines for wind development in California, Washington, Pennsylvania, and New York, and working cooperatively to improve the siting, design, and management of wind facilities throughout the country.

Audubon believes that wind power must be considered in the context of its importance as a solution to global warming. Global warming resulting from the burning of fossil fuels is a severe threat to birds, wildlife, and habitat, and we have moral obligation to take action to control the pollution that causes global warming before it is too late.

Birds and wildlife will face losses of habitat due to sea level rise, more frequent and severe wild fires, loss of prey species, flooding and droughts, and other significant ecological changes. Birds, like most species, are highly adapted to particular vegetation and habitat types that may no longer exist or rapidly decline.

As the threats of global warming loom every larger, Audubon recognizes that alternative energy sources like wind power are essential. Many new wind power projects will need to be constructed across the country as part of any serious nationwide effort to address global warming. Audubon supports the expansion of properly sited wind power as a solution to global warming, and supports Federal legislation such as the Production Tax Credit and renewable electricity standard that would further encourage this expansion and help to reduce pollution from fossil fuels.

However, at the same time it is critical that this expansion be managed responsibly because it is clear that wind field facilities are capable of killing a large number of birds and other wildlife. Wind energy facilities can have detrimental impacts on birds, bats, and other wildlife in four fundamental ways: collision mortality, loss or degradation of habitat, disturbance and displacement from habitat, and disruption of ecological links.

If the wind industry expands significantly from 1 percent of the nation's electricity supply to 10 percent, or 20 percent or more, the cumulative effects on bird populations could be significant. Some early wind projects like Altamont in California are notorious for killing many raptures, including Golden Eagles. In cases where the birds affected are already in trouble such as sage grouse in windy parts of the plain states, the turbines could push them closer to extinction.

Overall, however, we believe the impacts can be greatly reduced through proper siting that avoids the most important habitat areas for birds and wildlife. The first rule of avoiding impacts will always be the old adage, "Location, location, location."

Efforts to otherwise minimize impacts are hampered by significant gaps in the research. These research gaps make it difficult for scientists to draw conclusions about wind power's overall impact on birds and wildlife. There is a shortage of information on migratory

bird routes, bird behavior, as well as the ways in which topography, weather, time of day, and other factors affect bird and bat mortality, and there are few comprehensive studies testing the effectiveness of various mitigation strategies.

Audubon strongly encourages an expansion of research capacity to best determine how to maximize the benefits of wind power while reducing the potential for harm to birds, wildlife, and the environment. We recommend that the committee consider establishing a greater Federal role in research in wind-wildlife interaction, and we also recommend that the committee consider policy options for providing incentives to the wind industry to follow the voluntary guidance that emerges from the Federal FACA process.

In conclusion, Audubon believes a significant expansion of properly sited wind power is necessary to address the severe threat of global warming, but much work needs to be done to ensure the expansion of the wind industry occurs without serious consequences for bird, wildlife, and their habitat. We look forward to working with the committee to find ways to support development of wind energy while providing adequate safeguards for birds, bats, and other wildlife.

Madam Chairwoman and Members of the Subcommittee, this concludes my prepared statement, and I will be happy to answer any questions you may have.

[The prepared statement of Mr. Daulton follows:]

**Statement of Mike Daulton, Director of Conservation Policy,
National Audubon Society**

Madam Chairman and Members of the Subcommittee:

I am Mike Daulton, Director of Conservation Policy for the National Audubon Society. Thank you for the opportunity to testify regarding the impacts of wind turbines on birds and bats. I commend you for holding this important hearing today.

National Audubon Society's 24 state offices and 500 local chapters throughout the United States serve more than one million members and supporters. Audubon's mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. Our national network of community-based nature centers and chapters, scientific and educational programs, and advocacy on behalf of areas sustaining important bird populations, engage millions of people of all ages and backgrounds in positive conservation experiences.

Audubon has a long history of involvement in wind-wildlife interaction issues, including efforts to develop state guidelines for wind development in California, Washington, Pennsylvania, and New York; providing substantive input regarding the Bureau of Land Management's policy for wind development on public lands; and working cooperatively to improve the siting, design, and management of wind facilities across the country.

As the threats of global warming loom ever larger, alternative energy sources like wind power are essential. Many new wind power projects will need to be constructed across the country as part of any serious nationwide effort to address global warming. This shift toward renewable energy is well underway. According to the American Wind Energy Association, over the past year the U.S. wind energy industry installed more than 2,400 megawatts of new power generation, making wind one of the largest sources of new power generation in the country at a time of growing electricity demand. The state of Texas recently announced its intention to become the country's wind power capital. Audubon supports the expansion of properly-sited wind power as a solution to global warming, and supports federal legislation, such as the Production Tax Credit and a Renewable Electricity Standard, which would further encourage this expansion and help to reduce pollution from fossil fuels.

At the same time, it is critical that this expansion be managed responsibly, because it is clear that wind facilities are capable of killing a large number of birds and other wildlife. Some early wind projects like Altamont in California are notorious for killing many raptors, including Golden Eagles. The lessons learned from

Altamont still loom over the industry: if wind turbines are located in the wrong places, they can be hazardous and they can fragment critical habitat. In cases where the birds affected are already in trouble, such as sage grouse in windy parts of the Plains States, the turbines could push them closer to extinction.

Much work remains before scientists have a clear understanding of the true impacts to birds and wildlife from wind power. Scientists are particularly concerned about the potential cumulative effects of wind power on species populations if industry expands dramatically. Significant development is being considered in areas that contain large numbers of species or are believed to be major migratory flyways, such as the Prairie Pothole region and the Texas Gulf Coast.

On balance, Audubon strongly supports wind power as a clean alternative energy source that reduces the threat of global warming. Each individual wind project, however, has a unique set of circumstances and should be evaluated on its own merits.

Global Warming is a Severe Threat to Birds, Wildlife, and Habitat

Global warming resulting from the burning of fossil fuels is a severe threat to birds, wildlife, and habitat, and we have a moral obligation to take action now to control the pollution that causes global warming before it is too late. Global warming already is impacting birds, their prey, and their habitat, and these impacts will become more severe if action is not taken to greatly reduce pollution from the burning of fossil fuels.

Global warming threatens birds and wildlife in many ways. Birds and wildlife will face losses of habitat due to sea level rise, more frequent and severe wildfires, loss of prey species, flooding and droughts, increased invasive species, changes in vegetation and precipitation, and loss of snow and ice, and other significant ecological changes. Birds, like most species, are highly adapted to particular vegetation and habitat types that may no longer exist, shift toward the poles or higher elevations, or rapidly decline. New pests, invasive species, and diseases will create additional risks.

The timing of birds' migration, breeding, nesting, and hatching are highly adapted to the availability of suitable habitat, adequate prey and other food sources, and other factors. Since global warming is unlikely to cause different species to adapt or move at the same rate, bird behavior may no longer be in sync with their food sources and habitat needs.

Scientists are already observing global warming's impacts on birds. The results are alarming. More than 80 percent of plant and animal species studied have shown changes in timing of migration or reproduction, shifts in habitat or migratory routes, or other changes associated with global warming. Some of the observed impacts on birds include:

- Migratory birds, seabirds, and songbirds in North America are shifting toward the poles, as well as migrating and laying eggs earlier in spring
- Several North American warbler species have shifted northward more than 65 miles. The Golden-winged Warbler's range has moved nearly 100 miles north just in the past two decades.
- Adelie Penguins are taking longer routes to find food in the ocean as icebergs break off Antarctica's Ross Ice Shelf.

Birds that already live at high altitudes or latitudes may not be able to move with the changing climate. Endangered species with limited habitat and/or gene pools may also not be able to move or adapt quickly enough to avoid extinction. Species that depend on habitat types such as particular coastlines or polar ice also will be vulnerable as those habitats diminish or disappear.

In the United States, both prairie and coastal species will be severely impacted by global warming. More frequent and severe droughts in the Central U.S. are likely to cause prairie potholes to dry up, jeopardizing millions of waterfowl during breeding season. Sea level rise and erosion will jeopardize the threatened Western Snowy Plover and other shorebirds. Projected loss of neotropical migrant songbirds also is very high: 53 percent in the Great Lakes region, 45 percent loss in the Mid-Atlantic, 44 percent loss in the northern Great Plains and 32 percent fewer in the Pacific Northwest.

Significant Expansion of Renewable Energy Sources Such As Wind Power Is Needed to Reduce Pollution from Fossil Fuels and Address Global Warming

To protect birds, wildlife, and habitat from global warming, it is necessary to reduce pollution resulting from the burning of fossil fuels, particularly when generating electricity. Fossil fuel power plants account for more than one-third of the

carbon dioxide emitted by the United States, and carbon dioxide emissions from power plants were 27 percent higher in 2004 than in 1990.

To reduce pollution from fossil fuels, we must diversify our energy sources with clean alternatives such as wind and solar power. There are numerous opportunities to reduce carbon dioxide pollution from a variety of sources and set us on a course that can minimize the economic and ecological damages of global warming.

However, it is important to be mindful that real solutions will require major shifts in America's energy generation and use. As the analysis published by Robert Socolow in the journal *Science* in August of 2004 demonstrates, in order to stabilize carbon dioxide levels in the atmosphere globally, emissions must be cut by more than half from their projected levels in 2050 under a "business as usual" scenario. This amounts to slowing growth by 7 gigatons of carbon emissions per year. Reductions of this magnitude will require rapid expansion of available renewable power sources such as wind power. To achieve 14 percent of the reduction goal, for example, would require development of 2 million 1 megawatt wind generators worldwide. On a shorter time horizon, to generate 5 percent of the nation's electricity by 2020 using average size (1.5 MW) wind turbines, would require more than 62,000 additional turbines to be constructed in the United States, adding to the more than 16,000 turbines already constructed.

To achieve the necessary reductions in greenhouse gases, America must begin moving rapidly on a thoughtful, environmentally-responsible path toward a significant expansion of properly-sited renewable energy sources such as solar and wind power. The infrastructure that will be necessary to expand renewable energy generation and transmission at the level that is necessary to reduce global warming will result in a transformation of the landscape in many parts of the country. This transformation has the potential to come into conflict with efforts to conserve birds, wildlife, and their habitat.

Our challenge is thus to help design and locate wind power projects that minimize the negative impacts on birds and wildlife. All wind power projects should be fully evaluated on a case-by-case basis, prior to development, to ensure that site selection, design, and long-term monitoring and adaptive management plans avoid significant harm to bird and wildlife populations.

Planned Expansion of Largely Unregulated Wind Power Raises Conservation Concerns

Audubon is concerned about the potential cumulative effects of wind power on species populations if the wind industry expands dramatically. Significant development is being considered in areas that contain large numbers of species or are believed to be major migratory flyways, such as the Prairie Pothole region and the Texas Gulf Coast.

Wind energy facilities can have detrimental impacts on birds, bats, and other wildlife in four fundamental ways:

1. Collision mortality
2. Loss or degradation of habitat
3. Disturbance and subsequent displacement from habitat
4. Disruption of ecological links

Collision mortality:

Collision mortality occurs when animals collide with the moving turbine blades, with the turbine tower, or with associated infrastructure such as overhead power lines. Impacts vary depending upon region, topography, weather, time of day, and other factors. Several recent publications have reported that collision mortality is relatively low, e.g., a 2005 Government Accountability Office report concluded, "it does not appear that wind power is responsible for a significant number of bird deaths." That same report, however, noted that mortality can be alarmingly high in some locations. It also pointed out that there are vast gaps in the mortality data, and that the record may be biased because most of the information collected thus far has come from the West where collision mortality appears to be lower than in other regions, such as the Appalachians. Currently, collision mortality is being assessed at only a small minority of the wind energy facilities in the country. In some regions, it has not been assessed at all.

Loss or degradation of habitat:

Development of wind power facilities results in destruction of habitat from support roads, storage and maintenance yards, turbine towers, and associated infrastructure. It may involve blasting and excavation to bury power lines. Such activity may cause contiguous blocks of habitat to become fragmented, leading to increased abundance of predators, parasites, and invasive species. This may not be a problem where native habitats have already been disturbed, such as agricultural areas, but

it can have substantial impacts if the wind energy facilities are sited in areas of pristine or rare native habitats.

Disturbance and subsequent displacement from habitat:

The impacts of wind energy facilities extend well beyond the footprint of the roads, power lines, and other structures. Disturbance from human activity and turbines may displace animals from the habitat. While this is seldom lethal, it may cause birds and other animals to abandon preferred habitat and seek lower-quality habitat elsewhere, where disturbance is less. This may result in reduced survival or reduced breeding productivity, which may cause lower or declining populations.

It appears that some birds, such as prairie grouse and other grassland birds, avoid places with tall structures. These species are adapted to open habitats where raptor predation is a major source of mortality. Tall structures in such habitats give raptors an advantage by serving as perching sites, allowing them to survey the landscape in search of prey. Some ornithologists believe prey species, such as Greater Sage-grouse and prairie chickens, are behaviorally programmed to perceive tall structures as a threat, and therefore avoid using habitats where tall structures exist. In cases where the birds affected are already in decline, the turbines could push them closer to extinction.

Disruption of ecological links:

Large wind energy facilities may interfere with the ability of birds and other wildlife to travel between feeding, wintering, and nesting sites. Alternatively, they may cause birds to make longer or higher flights between such areas. This results in higher metabolic costs, and therefore may reduce survival and reproduction.

Federal Guidelines and Expanded Research Capacity Are Needed

Impacts to birds, bats, and other wildlife from wind projects can be largely avoided if the most important habitat areas are not developed. The first rule of avoiding impacts will always be the old adage “location, location, location.” Audubon believes that places where birds gather in large numbers or where many species are present, such as the Prairie Pothole region, the Texas Gulf Coast, or raptor migration bottlenecks in the Northeast, should be largely avoided.

If impacts cannot be avoided, they should be minimized. However, minimizing impacts effectively requires that the impacts be accurately predicted, verified, and mitigated. Sound project-level decisions regarding minimization of impacts require a comprehensive body of scientific research to predict wildlife impacts, a process for gathering adequate information at the site-specific project level before and after construction, and a process for modifying projects effectively after problems arise.

Currently, there are no mandatory federal regulatory standards, and few state standards, regarding the design or siting of wind power facilities to reduce risks to birds and other wildlife. The U.S. Fish and Wildlife Service (FWS) and several states have published guidelines, but these are merely advisory in nature, and in most cases compliance is voluntary. Some federal land management agencies have adopted guidelines for wind power developments on public lands, but the guidelines fail to provide adequate measures for mitigating the risks to birds.

In most cases, county or local governments are responsible for the regulation and permitting of wind turbine siting. Siting decisions are often made based on wind resources, ease of access to land, and accessibility of transmission lines. At present, little or no effort is made to coordinate the siting of wind facilities at a regional scale to avoid conflicts with migratory birds and bats. At the local scale, minimal pre-construction inventories of bird use are conducted to assess potential risks to birds. Furthermore, because there are no widely recognized standards for unacceptable levels of mortality and other risks such as displacement, it is rare for a wind power proponent to reject a site solely on the basis of risks to birds.

According to a study by the Government Accountability Office, some state and local regulatory agencies have little experience or expertise in addressing environmental and wildlife impacts from wind power. For example, officials from one state agency interviewed by the GAO said they did not have the expertise to evaluate wildlife impacts and review studies prior to construction, and they rely on the public comment period while permits are pending for concerns to be identified by others.

At the federal level, the U.S. Fish and Wildlife Service is responsible for implementing the Migratory Bird Treaty Act and other laws protecting migratory birds. Generally, the FWS carries out its responsibility to protect migratory birds by issuing guidelines to advise energy developers about the best management practices needed to prevent or minimize violations of federal bird protection laws, and has not prosecuted a single case citing a violation of wildlife laws against a wind developer.

In July 2003, the FWS published its Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines, and accepted public comment on the proposed guidelines until July 2005. The proposed interim guidelines received criticism from both the wind industry and wildlife conservation advocates. In late 2005, an attempt was made to establish a collaborative forum in which the FWS, the wind power industry, wildlife conservationists, and renewable energy advocates could seek common ground and try to develop guidelines that would meet the needs of all interests. These efforts continued until February 2006, when they were suspended due to the threat of a lawsuit charging the FWS with violating the Federal Advisory Committee Act (FACA). Over the next year, the FWS worked to form a multi-stakeholder process that will comply with FACA. In March 2007, the FWS announced the formation of a Wind Turbine Guidelines Advisory Committee (that will be chartered under FACA) to develop new guidelines.

Audubon encourages this FACA process as a necessary means of providing guidance to state and local regulatory authorities, to prevent local conflicts that may unnecessarily arise in the absence of such guidance, and to better ensure protection of birds, wildlife, and habitat.

Research:

Significant gaps in the literature make it difficult for scientists to draw conclusions about wind power's impact on birds and wildlife. There is a shortage of information on migratory bird routes, bird and bat behavior, as well as the ways in which topography, weather, time of day, and other factors affect bird and bat mortality. Studies conducted at one location can rarely be extrapolated to another location due to differences in site-specific conditions such as topography, types and densities of species present, types of wind turbines present, and use of different monitoring and surveying protocols. Mortality studies and monitoring conducted by industry is considered proprietary information and often is not openly shared with the public or with government agencies. Finally, there are few comprehensive studies testing the effectiveness of various mitigation strategies.

Some significant research questions that deserve priority attention are as follows:

- Is it possible to predict what fatalities (number and species) will occur before construction begins, and what data should be collected to accurately predict fatalities?
- Can we identify areas of high bird abundance and high risk, and find ways to steer wind development away from those areas?
- What is the level of collision mortality in regions other than the West? Can we develop a single, scientifically sound, consistent protocol to assess sites and compare mortality levels across all regions of the country? What can we learn about risk factors (e.g. region, habitat type, topography, season, time of day, weather, etc.) from mortality assessment data?
- What levels of fatalities are being documented regarding protected species, including threatened and endangered species and Birds of Conservation Concern? What are the cumulative population impacts of wind facilities on birds and bats?
- What are the specific habitat and behavioral impacts and effects of wind energy facilities, and how do they influence populations?
- What are effective methods to reduce mortality? If they exist, what is the best protocol to deploy them?

Audubon strongly encourages an expansion of research capacity to best determine how to maximize the benefits of wind power while reducing the potential for harm to birds, wildlife and the environment. We recommend that the Committee consider establishing a greater federal role in research on wind-wildlife interaction, with particular attention to the research gaps identified. The Committee should consider establishing a formal structure, such as a task force, to direct this expanded federal research role, to collect and review its results, and to propose modifications to the federal guidelines. The task force should include representatives from government agencies such as the U.S. Geological Survey, the U.S. Fish and Wildlife Service, and the National Renewable Energy Laboratory, as well as scientific experts from academia and nongovernmental organizations such as Audubon.

Congress Should Consider Providing Incentives to the Wind Industry to Address Bird and Bat Impacts

Establishing federal voluntary guidelines is an important first step toward improving the siting, design, and management of wind facilities, and will have particular value in educating state and local regulatory authorities regarding the appropriate considerations to be taken into account in permitting decisions. However, some regulators and wind developers may choose to ignore the voluntary guidance.

For that reason, Audubon recommends that the Committee consider policy options for providing incentives to the wind industry to follow the voluntary guidance that emerges from the federal FACA process.

Policy options may include developing a certification process that would provide assurances to financial institutions providing financing for wind projects that they carry low risk while also providing assurances to electric utilities that they are purchasing wildlife-friendly renewable energy projects; and establishing a mitigation fund or grant program that would lower the costs of project modifications and other forms of mitigation. A federal investment in these incentives would help to guide the necessary expansion of renewable energy while helping to provide adequate safeguards for birds, bats, and other wildlife.

Conclusion

A significant expansion of properly-sited wind power is necessary to address the severe threat of global warming, but much work needs to be done to ensure the expansion of the wind industry occurs without serious consequences for birds, wildlife, and their habitat. Research suggests that rare raptors and sensitive grassland birds may be put at risk by wind development, and many scientists are concerned that expansion of major wind developments into important migratory bird habitat and flyways in areas like the Prairie Pothole region and the Texas Gulf Coast could have serious consequences for bird and wildlife populations. Audubon supports efforts to establish federal guidelines for the wind industry to better ensure protection for birds and wildlife, and recommends that the Committee consider ways to expand research capacity to provide better scientific information that would inform project siting, design, and management decisions. The Committee also should consider providing incentives to the wind industry to help guide the necessary expansion of renewable energy while providing adequate safeguards for birds, bats, and other wildlife.

Madam Chairman and Members of the Subcommittee, this concludes my prepared statement. I would be happy to answer any questions you may have.

Response to questions submitted for the record by Michael Daulton, National Audubon Society

Questions from Mr. Brown:

- (1) **Mr. Daulton, in your testimony, you noted that: “A significant expansion of properly-sited wind power is necessary to address the severe threat of global warming”. I agree that it is important that all wind power facilities be properly sited, how do we achieve that goal?**

At this time, there should be nationwide minimum guidelines on the siting of wind power projects to minimize their impacts on birds and other wildlife. They should clarify which areas should be excluded from wind power development due to conservation concerns and which areas are more suited for siting, the appropriate pre-construction studies, and other factors. In addition, the federal government should increase funding for research and quickly engage in a mapping effort that would provide a coarse filter for determining the areas of high and low risk for conflicts between wind development and bird and wildlife conservation. Additional incentives (both financial and regulatory) may be needed to provide further guidance to industry to attain the highest standards for bird and wildlife protection.

- (2) **Was Altamont Pass Wind Resource Area simply sited in the wrong location?**

The Altamont Pass Wind Resource Area was very poorly sited in an area that is both a ground squirrel colony providing an abundant food source for raptors and also an important wintering area for Golden Eagles. Audubon is working closely with the wind industry and the local permitting agencies to develop a long-term conservation plan that facilitates re-powering (replacement of old turbines with newer, more efficient ones) while striving to reduce bird impacts by more than 50 percent.

- (3) **What are your hopes and expectations in regard to the new Wind Turbine Advisory Committee?**

I hope that the Wind Turbine Advisory Committee can develop the guidance necessary to provide adequate safeguards for birds and wildlife while allowing the wind industry to further grow as necessary to be an important part of the solution to global warming.

(4) In your judgment, why hasn't a single violation of wildlife laws against a wind developer been prosecuted?

In their study published in September 2005, the Government Accountability Office reviewed this question and found that more than 50 instances of Golden Eagles killed by 30 different companies at Altamont Pass were referred by the U.S. Fish and Wildlife Service to the Interior Solicitor's office for civil prosecution or the Department of Justice for criminal prosecution. Justice officials told GAO that, in general, when deciding to prosecute a case criminally, they consider a number of factors, including the history of civil or administrative enforcement, the evidence of criminal intent, and what steps have been taken to avoid future violations. The Justice Department does not discuss the reasons behind specific case declinations as a matter of policy, nor does it typically confirm or deny the existence of investigations. Interior's Office of the Solicitor General told GAO that they have not pursued prosecution of cases at Altamont Pass because Justice agreed to review turbine mortalities for possible criminal prosecution.

(5) What are the federal protections for non-listed bat species?

We would refer the committee to Bat Conservation International, which also was represented on the hearing panel, for questions regarding the statutory protection for bats.

(6) Congressman Mollohan mentioned the "impacts on the natural beauty" of wind power facilities. How much should the Federal government regulate view impacts of Federally-permitted activities and projects? If you agree that the Federal government should, how would you create standards?

View standards may be appropriate for existing protected areas to ensure protection of natural scenic attributes. Areas that may be appropriate for such protection include National and State Parks, Wilderness Areas, National Monuments, and National Seashores.

(7) How many lawsuits have you or your organization filed against the Federal government in the last five years? Please elaborate on what issues the suits concerned and which agencies were the target of the lawsuit. Have you filed any related to wind power projects?

See enclosed.

(8) Do you or any members of your organization serve on any Federal advisory panels or committees as a representative of your organization?

No.

(9) Do you, your organization, or any of the officers or full time employees of your organization receive any Federal grants, contracts or other funds? If so, please elaborate.

I provided the committee with documentation as requested via facsimile prior to the hearing. Please let me know if any additional documentation is needed.

Response to Question 7 from Congressman Brown regarding litigation against the federal government filed by the National Audubon Society during the last five years

Audubon has identified 20 cases filed in the last five years in which the National Audubon Society has participated as a plaintiff against the federal government. Below is a list of those cases. The agency is identified as well as the principal statute or issue involved. National Audubon has not filed any suits related to wind power projects.

National Wildlife Federation v. Souza, No. 2-07-cv-14114-JEM (S.D. Fla. filed Apr. 6, 2007). The federal defendants are the Department of the Interior, including the Fish and Wildlife Service, and the Corps of Engineers. The suit concerns a development in the Corkscrew Swamp and presents issues principally under the ESA, the Clean Water Act, and NEPA.

Friends of Congaree Swamp v. South Carolina Department of Transportation, No. 3:06-CV-02538 (D.S.C., filed Sept. 13, 2006). The federal defendant is the Department of Transportation. The suit concerns South Carolina Highway 601 improvements and presents issues principally under the Clean Water Act and NEPA.

Conservancy of Southwest Florida v. U.S. Army Corps of Engineers, No. 06-80532-CIV-HURLEY (S.D. Fla. filed May 18, 2006). The federal defendants are the Department of the Interior, including the Fish and Wildlife Service, and the Corps of Engineers. The suit concerns a development in the Corkscrew Swamp and presents issues principally under the ESA, the Clean Water Act, and NEPA.

National Audubon Society v. Kempthorne, No. 06-349-RCL (D.D.C. filed Feb. 28, 2006). The federal defendant was the Department of the Interior, including the Fish and Wildlife Service. The suit concerned the Cerulean Warbler and presented issues under the ESA.

National Wildlife Federation, et al. v. Souza, No. 06-CV-80532 (S.D. Fla. filed June 1, 2005). The federal defendants are the Department of the Interior, including the Fish and Wildlife Service, and the Corps of Engineers. The suit concerned a development in the Corkscrew Swamp and presents issues principally under the ESA, the Clean Water Act, and NEPA.

National Audubon Society v. Kempthorne, No. 1:05-CV-0008 (D. Alaska, filed Mar. 26, 2005). The federal defendant was the Department of the Interior. The suit concerned oil and gas leasing in the area of Teshekpuk Lake/Northeast Planning Area NPR-A and presented issues principally under the ESA and NEPA.

Natural Resources Defense Council, et al., v. U.S. Forest Service, 421 F. 3d 797 (9th Cir. 2005). The federal defendant was the United States Forest Service. The suit concerned Roadless Areas in Tongass National Forest and presented issues under NEPA.

Natural Resources Defense Council v. Rodgers, No. 2:88-CV-01658 (E.D. Cal.). Settled in 2006. The federal defendant was the Bureau of Reclamation. The suit concerned Friant Dam water contracts and restoration of the San Joaquin River.

Northern Alaska Environmental Center v. Norton, 361 F. Supp. 2d 1069 (D. Alaska 2005), aff'd sub. nom., *Northern Alaska Environmental Center v. Kempthorne*, 457 F.3d 969 (9th Cir. 2006). The federal defendant was the Department of the Interior, including the Bureau of Land Management and the Fish and Wildlife Service. The suit concerned oil and gas leasing in the Northwest Planning Area of NPR-A and presented issues principally under the ESA and NEPA.

Utah v. United States, No. 2:97-CV-927-AK (D. Utah, filed Aug. 24, 2005). The federal defendant was the Department of the Interior, Bureau of Land Management. The suit concerned Utah's claim to sovereign lands and the public trust doctrine.

The Wilderness Society v. U.S. Forest Service, No. 05-04038-EDL (N.D. Cal. filed Oct. 6, 2005). The federal defendant was the Department of Agriculture, including the Forest Service. The suit concerned the repeal of the Roadless Area Policy and presented issues principally under NEPA.

National Audubon Society v. Department of the Navy, No. 2:04-CV-2-BO(2) (Eastern NC District, filed May 4, 2005). The federal defendant was the Navy. The suit concerned a proposed offsite Navy land field near Pocosin Lakes National Wildlife Refuge and presented issues principally under NEPA.

Washington County, N.C. v. U.S. Department of the Navy, Nos. CV.A.2:04-CV-3-B0(2), CV.A.2:04-CV-2-B0(2) (E.D.N.C., filed April 20, 2004). The federal defendant was the Navy. The suit concerned compliance with NEPA.

Rio Grande Silvery Minnow v. Keys, Nos. 02-2130, 02-2135, 02-2151, 02-2152, 02-2160, 02-2186; 355 F. 3d 1215 (10th Cir. 2004). The federal defendants were the Department of the Interior, including the Fish and Wildlife Service and Bureau of Reclamation, and the United States Army Corps of Engineers. The suit concerned the endangered silvery minnow and presented issues principally under the ESA.

National Audubon Society v. Evans, No. Civ.A.99-1707(RWR) (U.S.D.C. District of Columbia, filed July 3, 2003). The federal defendant was the Department of Commerce, including NOAA Fisheries. The suit concerned the Highly Migratory Species Fishery Management Plan under the Magnuson-Stevens Fishery Conservation and Management Act.

The Wilderness Society v. Norton (E.D. Ca., decided June 12, 2003). The federal defendant was the Department of the Interior. The suit concerned management of the Lower Klamath and Tule Lake National Wildlife Refuges and presented issues principally under NEPA.

The Ocean Conservancy v. Evans, No. 8:03CV124T24EAJ (M.D. Fla. decided Dec. 17, 2003). The federal defendant was the Department of Commerce, including NOAA Fisheries. The suit concerned an emergency rule issued under the Magnuson-Stevens Fishery Conservation and Management Act.

National Audubon Society, Inc. v. Davis, No. CV-98-04610-CAL. (N.D. Cal., filed September 24, 2002). The federal defendant was the Fish and Wildlife Service. The suit concerned issues under the ESA.

National Audubon Society v. Evans. No. 99-1707 (D.D.C. decided July 3, 2003). The federal defendant was the Department of Commerce, including NOAA Fisheries. The suit concerned conservation of Atlantic bluefin tuna under the Highly Migratory Species Fishery Management Plan under the Magnuson-Stevens Fishery Conservation and Management Act.

Vermont Public Interest Research Group v. U.S. Fish and Wildlife, No. 2:01-CV-332 (D. Vt., decided Sept. 13, 2002). The federal defendant was the United States

Fish and Wildlife Service. The suit concerned proposed releases of lampricides into a lake and presented issues under NEPA.

Ms. BORDALLO. Thank you very much, Mr. Daulton, and I will now recognize members for any questions they may wish to ask the witnesses alternating between the majority and the minority, and allowing five minutes for each member. Should the members need more time, we will have a second round of questions, but at this time since our distinguished Chairman of the Natural Resources Committee with us, I would like to give him the opportunity to ask questions first.

Mr. RAHALL. Thank you, Madam Chair. I really don't have any questions, specific questions for this panel on the subject at hand. I do appreciate their expert testimony.

I would just like to remind Mr. Hall, Director of Fish and Wildlife Service, of a communication that I have sent him in regard to the proposed de-listing of the Northern Virginia fly squirrel, and hope that he could supply those documents to my office per the letter I have written him, which you should have in your office.

Thank you, Madam Chair.

Ms. BORDALLO. Thank you, Mr. Chairman.

I have a couple of questions for Mr. Hall. Mr. Hall, the Service published interim guidelines in 2003 regarding the siting, construction, and operation of wind turbines, and received significant public comment on them. Since closing the public comment period in 2005, however, the Service has declined to publish the final guidelines.

Mr. Hall, what is the status of these guidelines? Does the Service intend to publish final guidelines in the near future, and why wasn't the formation of a new advisory committee necessary?

Mr. HALL. Thank you, Madam Chairman.

After the 2005 two-year public comment period, there were extended discussions with members of the public and others, and there was a Federal Advisory Committee Act allegation, and so the efforts there were basically put on hold for the formation of this formal Federal Advisory Committee Act that would work with us over the next two years.

I would also like to point out that after two years of public comment, there was very little resolved on how to site because the information isn't there. A lot of the biology isn't there. There is so much we don't know that there was still a lot of controversy even associated with the 2005 draft interim guidance.

So we are hopeful, we are very hopeful that this Federal Advisory Committee Act that we will be forming will get us to some substantive approaches to try and work through these pretty sticky issues.

Ms. BORDALLO. To follow up, Mr. Hall, on the same questioning. As noted earlier, as I said, the Service held open an extensive public comment period. It was for a couple of years. So it is my understanding that a significant majority of responders were in favor of the guidelines. Is that accurate?

Mr. HALL. I think it is accurate to say that the vast majority of people supported getting some sort of protocol, some sort of guideline out there, or a series of guidelines on how to do this. The devil

was in the details on what they should be. There was a lot of disappointment that the Fish and Wildlife Service just didn't have the authority to go on to property and do analyses ahead of time without the permission of the landowner. There was a lot of concern about the biological aspects of what we know and don't know about the flight paths, and therefore several studies are underway now, and the Appalachian one is one of those, to try and figure out how the birds and bats move at night in these high-structured mountain areas.

So I think that there was a lot of support to have guidelines, a lot of support to have some rules, if you will, that people could follow, but not a lot of consensus on exactly what those rules should say.

Ms. BORDALLO. You said in answer to my first question, I think, that you put it on hold.

Mr. HALL. Well, we stopped the discussions.

Ms. BORDALLO. I was wondering if there was financial constraints or whatever the case might be. Did you note that?

Mr. HALL. I think we made it public that the challenge that we were working outside of compliance with the Federal Advisory Committee Act, and we let the public know that we wanted to go back and try and form this Federal advisory committee to try and help us work through it because after all these years it seems fruitless to try and get that far and then to be challenged because of the process.

Ms. BORDALLO. Well, OK. I have one other question now. Even though the Service has not published the final guidelines, can you tell us to what degree the industry adopted the voluntary guidelines in their siting and development decisions? And in light of this experience, should compliance with the future guidelines be mandatory or voluntary?

I think one of our witnesses stated what he thought of that. I think it was Dr. Fry.

Mr. HALL. I think compliance is sketchy at best. I think everything that you have heard about the industry's ability to accept or not accept them is accurate. We have very little Federal nexus unless it is on Federal lands working through an EIS or some other form to force them to follow them.

I do believe, my personal opinion, I believe if we go through all this effort to try and come up with guidelines that they should be more than advisory. However, I don't know exactly what kind of legal authority that we would have to make them binding.

Ms. BORDALLO. Let me ask Dr. Fry. Would you like to comment on that?

Mr. FRY. If you give Federal money to a project and you just decide that you are not going to have any oversight, it is stupid. You really do need to have Federal oversight if you are going to give Federal money, and you do also have to enforce Federal laws. When you kill a thousand Golden Eagles, and you have no explanation for why you haven't done any enforcement, you are giving the industry a complete green light to just go ahead and do business as usual.

Mr. GLITZENSTEIN. May I respond to that?

Mr. HALL. May I respond to that?

Ms. BORDALLO. Mr. Glitzenstein, yes.

Mr. GLITZENSTEIN. I think, just to follow up on what has just become clear, if there is a need for clear authority for the guidelines, Mr. Hall just testified that he would like to see those guidelines as more than simply advisory, as I understand his testimony, and he said the problem is what is the authority for making them more than advisory. I think that is clearly, as I understand it, a statement to the Subcommittee as to why we need some explicit legislation that would provide for those guidelines to have some enforceable effect.

So it appears that there is some kind of a consensus, at least on this panel, that there is a need for that, and without that I think there would be a concern about whether or not you can currently adopt enforceable guidelines of that kind.

Ms. BORDALLO. Thank you. Are there any others that would like to comment?

Mr. HALL. I would like to respond. Several times it was pointed up that we have not taken enforcement action, and I would like to clarify for the record that every time we have received under the Bald and Golden Eagle Protection Act or under the Migratory Bird Treaty Act an allegation our special agents have gone to investigation. Mr. Glitzenstein read from one of those reports.

We do not bring prosecutorial actions for criminal offense. We have to refer those to the United States attorney, and when those cases are brought and we provide the information to the United States attorney, it is the United States attorney that decides whether or not they will or will not bring cases of criminal malfeasance against anyone, but the Fish and Wildlife Service doesn't bring that.

We do the investigative work. We hand it over to the United States attorney, and the United States attorney makes that decision on behalf of the U.S. Government.

Ms. BORDALLO. Are there any other—yes, Mr. Daulton.

Mr. DAULTON. I would just like to point out that the Audubon Society would welcome discussion of any proposals, including possibly making those guidelines mandatory, to improve bird protection with regard to the siting and design of wind turbines. However, I do think that the committee should consider a broad range of options in terms of providing incentives to the industry to enter into some—to take more action both in terms of predicting the impacts and mitigating the impacts.

Ms. BORDALLO. Thank you. Mr. Hall, would it be possible for you to—you have declined to publish the final guidelines, but all of this public input, could you provide—it must be reams of paper over there in your department of the public input, so could we get a copy of those—

Mr. HALL. Absolutely.

Ms. BORDALLO.—comments from the public?

Mr. HALL. Absolutely.

Ms. BORDALLO. Thank you.

I now would like to call on the Ranking Member, Mr. Sali, for questions.

Mr. SALI. Thank you, Madam Chair.

First of all, I have a statement from Congressman Shuster, another statement or a letter to Ranking Member Brown from the Association of Fish and Wildlife Agencies, and a statement by the American Wind Energy Association, and I would like to ask unanimous consent that they be included in the record for today.

Ms. BORDALLO. So ordered.

[The statement submitted for the record by Mr. Shuster follows:]

**Statement of The Honorable Bill Shuster, a Representative in Congress
from the State of Pennsylvania**

Mr. Chairman, I want to thank you for holding this important hearing. Wind development and its positive and negative impacts on the environment are very important priorities for us to consider as wind power grows across the nation. In my district, there is a lot of potential wind development, so I consider hearings like this essential to gathering facts and information. I would encourage the committee to take a very open, objective look at this important topic.

To that end, Mr. Chairman, I want to draw the committee's attention to a bold, collaborative approach the Commonwealth of Pennsylvania has aggressively pursued over the last year on this topic. Just last week, the Pennsylvania Game Commission held a ceremony in which they announced cooperative agreement spearheaded by the Pennsylvania Wind and Wildlife Collaborative. The Collaborative is partnership between government officials, scientists, bird/bat experts, wind developers and environmental groups. This Pennsylvania-led collaborative effort can set a bold example for partnership that will provide better information and science, minimize and potentially mitigate adverse wildlife impacts, and create stronger partnerships to develop this important renewable resource.

By no means is wind power the sole answer to our environmental and energy challenges today, but it must certainly be a key part of advancing clean, renewable energy, while at the same time, providing economic opportunities for some of our most rural communities.

[A letter submitted for the record by the Association of Fish and Wildlife Agencies follows:]

ASSOCIATION OF FISH & WILDLIFE AGENCIES

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Honorable Charles Brown, Ranking Republican
Subcommittee on Fisheries, Wildlife, and Oceans
1124 Longworth House Office Building
Washington DC 20515

Dear Congressman Brown:

As you know, the Association of Fish and Wildlife Agencies (Association) represents the perspectives of the collective State Fish and Wildlife Agencies on important fish and wildlife issues. All 50 State Fish and Wildlife Agencies are members. The Association's members have a vital and vested interest in wind energy development and its potential impacts on wildlife and therefore request the submission of this letter to the hearing record of May 1, 2007. In the future, we would like to be considered to provide testimony related to wind energy and wildlife.

The Association appreciates that the development of wind and other renewable energy resources have potential environmental advantages over the development and use of nonrenewable sources. We also believe that thoughtful placement of wind energy development is necessary to maintain healthy fish and wildlife populations across North America. In order to better engage the State Fish Wildlife Agencies, industry, federal agencies, and non governmental agencies in a landscape-level

dialogue, the Association created a Wind Energy Subcommittee under our Energy and Wildlife Policy Committee.

We have also worked with numerous partners including the U.S. Fish and Wildlife Service (USFWS) to develop a collaborative effort to address wind energy and wildlife interactions at the national scale. Although partners attempted to develop a collaborative in late 2005, due to legal constraints, the USFWS was required to develop the USFWS Wind Turbine Guidelines Advisory Committee on which we are now engaged. The USFWS has been fully supportive of collaborative efforts in this policy area. It was threatened legal challenges that compelled the creation of the Federal Advisory Committee (FAC). The USFWS acted expeditiously in creating the FAC and securing its approval by the Administration.

We believe that we have an unprecedented opportunity to work with industry and land use and regulatory agencies at a landscape scale to lessen potential wildlife impacts including direct impacts to birds and bats; habitat fragmentation from wind energy farms and transmission lines; and changes in migratory patterns of big game. We look forward to working with the Subcommittee on this issue.

I appreciate your time and consideration of this issue. Please don't hesitate to contact Gary Taylor, Legislative Director, Association of Fish and Wildlife Agencies, at (202) 624-7890 for additional information.

Respectfully,

Gary J. Taylor
Legislative Director

cc: Delegate Madeleine Z. Bordallo

[A statement submitted for the record by the American Wind Energy Association follows:]

Statement of the American Wind Energy Association

Wind energy is one of the most environmentally-friendly energy technologies in the world. One hundred per cent clean, wind energy provides electricity without harmful global warming pollutants like carbon dioxide. In addition, wind energy does not require any mining, drilling, transportation, or waste disposal.

"Wind energy development's overall impact on birds is extremely low compared with many other human-related activities," said AWEA's Executive Director Randall Swisher. "Many more birds are killed flying into buildings, for example, than wind turbines."

Wind energy will never be a significant source of bird mortality compared to other sources such as buildings, vehicles, communication towers, and even cats. For every 10,000 birds killed by human activities, less than one is caused by a wind turbine.

National Audubon Society President John Flicker himself is an outspoken proponent of wind energy. In a column he wrote for the November-December 2006 issue of the Society's magazine, he stated that Audubon "strongly supports [properly sited] wind power as a clean alternative energy source" and pointed to the threat global warming poses to birds and other wildlife.

"The wind industry is a conscientious and highly active steward of the environment and supports and funds innovative wildlife research through collaborative agreements with conservation groups and foundations," said Swisher.

The wind energy industry has worked for years to reach out and cooperate with conservation groups and government agencies on research and joint initiatives:

National Wind Coordinating Collaborative—10 years

Bats & Wind Energy Cooperative—3 years

Grassland/Shrub-Steppe Species Collaborative—2 years

Swisher added: "Wind power is an essential element in responding to both climate change and the exponentially increasing demand for electricity in the U.S. It's 100 per cent clean, free and inexhaustible, and a readily available and cost-effective source of energy."

AWEA estimates that in 2007, wind electricity will displace approximately 19 million tons of carbon dioxide—the leading greenhouse gas and primary global warming pollutant—which otherwise would be emitted by traditional energy sources such as coal, natural gas, oil and other sources. With the growing public demand for clean energy, there is broad recognition—among President Bush, Congress and business leaders—that wind energy is essential in balancing our nation's energy needs.

AWEA is the national trade association of America's wind industry, with a membership that includes global leaders in wind power development, wind turbine

manufacturing, and energy, as well as a broad range of component and service suppliers. More information on wind energy is available at the AWE A Web site: www.awea.org.

Mr. SALI. Thank you, Madam Chairman.

Mr. Arnett, I am trying to think back through the testimony and I didn't take notes, but did you say that the impact of bats could accumulate and be one to two million within a very short time with the projects that are on the table, is that correct?

Mr. ARNETT. Dr. Fry gave specific numbers. We have a paper that is being published in the "Frontier Ecology and the Environment" by some colleagues that have made some projections for the Mid-Atlantic Region based on a number of assumptions on installed capacity. Those numbers currently were estimated at—given the National Renewable Energy Lab's projection for installed capacity in that region to be somewhere between 33,000 and 64,000 bats that would be killed given those assumptions.

My point was, was that as we think about other projects, other regions and differing fatality rates across those regions, the numbers certainly could escalate. And if we think about the 20 percent factor that is being touted now, and that would probably—National Renewable Energy Lab as speculated that that would be somewhere around 325,000 megawatts installed capacity. If you do the math, the numbers escalate very rapidly.

Mr. SALI. OK. Now, I appreciate that clarification. You said during your testimony that bats are attracted to the wind turbines. Am I correct in that?

Mr. ARNETT. We have evidence from the Mountaineer studies that I was involved with in 2004 to suggest that the bats most certainly are attracted to these turbines. And if you would like, I have thermal imaging videos I would be happy to show you after the hearing.

Mr. SALI. OK. Well, my question is this. If they are attracted to the turbines, then how can you site them in a place where they won't be attracted to them?

Mr. ARNETT. That creates a very interesting conundrum for us because in fact the studies that are conducted pre-construction may lead us down the path of committing what is called a Type 2 error in statistics where we actually would collect the data pre-construction and assume no potential impact, but in fact the bats are attracted they may be killed at higher than expected rates and leading to the fatal conclusion that there was an impact when we previously said there was none, and it is a real problem for us.

Mr. SALI. OK. I am trying to recall my biology and you are the expert and I am not, but basically I have understood that bats essentially hunt by some kind of sonar.

Mr. ARNETT. Echo location, that is correct.

Mr. SALI. OK. And I have watched bats. I have them in my backyard, and thankfully they hunt lots of insects there, but as they dart and turn very sharply to catch those insects, I am wondering how is it that they can locate those insects, which are very small, and navigate in a way to catch them but they can't locate those blades of that turbine and something that is coming at a constant rate of speed, they can't navigate away from those.

Mr. ARNETT. Well, the one thing we clearly do not understand is how the animals actually receive the echoes returning from a plastic-based or whether there are other substance turbine blades are made of moving at up to speeds of estimated between 140 and 180 miles per hour on full operational speed. We simply don't have any information on how they receive those signals from something moving that fast.

Furthermore, as the bats are moving through the air space at time one they may not detect any action of the blades or detect the presence of the blade, and at time two they are struck or caught in the wake. We think some of the bats may in fact actually be killed by the bodices that are created and thrown to the ground via the wake of the turbines moving that fast.

So your point is very well taken. How can they not perceive them? We think they do when they are moving slowly. We actually have a video tape of bats chasing slow moving blade tips, but there are a number of uncertainties as to how they perceive these turbines, none the least of which is we actually believe they may be attracted to them as potential roost sites or places to congregate with potential mates in the fall.

Mr. SALI. Because other bats are attracted to the blades?

Mr. ARNETT. There is a hypothesis that has been generated recently about the behavior of the bats that are killed most frequently at these turbines. They happen to be migratory tree-roosting and foliage-roosting bats, and these are animals that are solitary in the landscape during spring and summer. They go their separate ways, males and females segregate, but they do tend to congregate in the fall for breeding purposes, and there is a hypothesis suggesting that they may aggregate at tall structures in the landscape. If that hypothesis is true, then there may be some sort of flocking, mating type behaviors that attract these.

Regardless, we are left with a few options other than understanding how to better site, curtail operations, or scare the bats away so to speak, and we are in fact embarking on some work on deterring mechanisms, and in fact to try and jam their echo location system, not so much to scare them away but to make the air space around the turbines uncomfortable and so they can't get return echoes and such. Those investigations have proved promising in the lab and in initial field experiments but we have yet to develop a fully operational system, and tests are underway this summer to continue embarking on that endeavor.

Mr. SALI. Thank you Madam Chair.

Ms. BORDALLO. I thank the Ranking Member, and now I recognize the gentleman from Michigan, Mr. Kildee.

Mr. KILDEE. Thank you, Madam Chair.

I think we can all learn from the past. The Fish and Wildlife Service was established in 1903, over 100 years ago, and I had mentioned to Congressman Mollohan about the salmon, and I think we can learn from the past.

Can you recall what was the role—I know this is going back in history, but the role of the Fish and Wildlife Service when they were building the dams and diverting the water, I know they did some fish flatters and things like that—what was the role at that time? Were they anticipating the damage that would be done?

Mr. HALL. I think the role at that time—it depends on the date of the dam. If it was after the thirties, then the Fish and Wildlife Coordination Act might have been in play, and there would have been reports written and consultations done, and I worked in the northwest for about six and a half years, and heard lots of discussions about the salmon and the dams, and how they got started, and I have heard people discuss the fact that it was recognized that there could be impacts to the salmon fishery out there, to the salmon runs.

But at the time that things were going on rural development for electricity, lots of homes didn't have it, and they were weighing those kinds of needs of the public, and I have heard at least two people who have really researched this say that they believed it was a conscious decision.

I think in learning from those types of experiences though we have the opportunity to do a lot better with wind power, and have it be an alternative source of energy but have one that is done correctly.

Mr. KILDEE. I am happy to hear that, that you have learned from the past because there is something analogous there between the two, and I think all of us support increasing our electrical energy power. I have no problems with wind power, but I want to make sure that we can mitigate the negative impacts.

Let me ask you this question. I come from the Great Lakes. My district borders on the Great Lakes. A renewable energy study by the Environment Michigan estimates that up to 150 percent of Michigan's electrical energy needs could be met by fully developing Michigan's offshore wind energy potential; that is, five to 12 miles off the coast.

What do we know about offshore wind energy and its impact on wildlife and habitat, especially in the Great Lakes, Mr. Hall?

Mr. HALL. Well, unfortunately, we don't know a lot. We don't know a lot about on land and the impacts that are occurring, but you can imagine in an ocean or a Great Lakes' environment where any damaged birds would not be readily seen probably 30 minutes after they have been hit. So I think there is a lot of unknowns associated with wind power over significant bodies of water.

Mr. KILDEE. Considering that you, and I appreciate your candor as you admit that we know very little about the present and cumulative impacts of wind energy on wildlife, do you agree that we should be operating more cautiously to evaluate wind power projects before they are built?

Mr. HALL. I do, sir. I think that it is very prudent to do the studies that are necessary pre-construction to try and find out the wind vectors, the use of those vectors by the birds both onshore and offshore, and then there are other impacts in the offshore arena as well that are below the surface that would probably need to be looked at, and the National Marine Fishery Service or the Fish and Wildlife Service in the Great Lakes with the fisheries involved as well.

Navigation, there are lots of things involved in the open water environment, but I really do encourage prudence. We know that this is a source that could be a very good clean source of energy, but we really do want it to be green.

Mr. KILDEE. Appreciate it. Anyone else want to comment on that?

Mr. ARNETT. Congressman, I was just going to add that recently I have been chairing a technical review committee for the Wildlife Society, preparing a summary document on the impacts of wildlife and wind energy development which will be released soon. We did a summary of offshore issues, and I would call to your attention, and can get the information to you that the National Renewable Energy Lab has recently—I believe it was last year—published a review by Dr. Michael Morrison from Texas A&M University who summarized the impacts of offshore development, and drew inferences from studies that had been conducted in Europe most extensively, and related that to development in not only the Great Lakes but also the Atlantic coast and probably most importantly, the lower Gulf coast where there are serious concerns about development in that particular region.

The Wildlife Society review will be out shortly, and I can get you the information on the review that is currently available on National Renewable Energy Lab's website.

Mr. KILDEE. Madam Chair, could we include that in the file or the record of this hearing?

Ms. BORDALLO. No objection.

Mr. KILDEE. Thank you very much.

[NOTE: The National Renewable Energy Laboratory report entitled "Bird Movements and Behaviors in the Gulf Coast Region: Relation to Potential Wind Energy Developments" by M.L. Morrison, Texas A&M University, has been retained in the Committee's official files.]

Mr. KILDEE. Thank you. Thank you very much.

Mr. FRY. Member Kildee.

Ms. BORDALLO. Yes.

Mr. FRY. The Minerals Management Service has just commissioned a review, worldwide review of literature on wildlife impacts from offshore wind. That was prepared by Research International in South Carolina, and I received a draft of it yesterday. I sit on the Federal Advisory Committee for Minerals Management for Offshore Wind, and we could—while I don't think it would be appropriate for the draft, but certainly when that becomes final, and the next comments are on due on the 7th of May, so we should have it in the next month, we could provide that as well, which summarizes all the European literature as well as what we know from this country, but it is going to be very difficult, no question, to look at the impacts of offshore wind on birds because the carcasses disappear.

Mr. KILDEE. Madam Chair, also if I could ask consent that that be contained in the file or record of this—

Ms. BORDALLO. Without objection.

[NOTE: The report submitted for the record has been retained in the Committee's official files.]

Mr. KILDEE. Thank you very much.

Ms. BORDALLO. Thank you, Dr. Fry.

Mr. Hall, I have a question for you. You note in your statement that Federal regulation of wind power generally occurs only if a

proposal is located on Federal property or the development involves some form of Federal participation such as providing funding.

Why is a statutory responsibility to protect a wildlife resource held in trust for the American public not included in this list?

Mr. HALL. Are you talking about the migratory birds?

Ms. BORDALLO. That is correct.

Mr. HALL. And the Migratory Bird Treaty Act?

Ms. BORDALLO. Yes.

Mr. HALL. When I am talking about us having a legitimate legal entry into—before the fact—development, it is not much different for wind power than it would be for the Corps of Engineers having the responsibility to develop, or the Bureau of Reclamation develop dams, and we are involved early on there to work with them. And our efforts in those early consultations, and that was what I was pointing to early, we need early involved pre-construction so that we can talk about what the potential impacts might be, and hopefully avoid those impacts, or find ways to minimize or mitigate the impacts.

But we can't under the Migratory Bird Treaty Act or under the Bald and Golden Eagle Act go in before anything has happened and require them to come sit down and talk with us, and let us help develop the project. Our only real avenues are those projects that have a Federal nexus.

Ms. BORDALLO. Yes. The other question is other witnesses have testified that the current regulatory process does not provide for competent consideration of environmental threats. Now, you seem to agree with the need for environmental review when you note in your written statement that the, and I will quote you, "potential harm to wildlife populations from direct mortality and from habitat disturbance and fragmentation makes careful evaluation of proposed facilities essential."

Why has the Service not instituted a more rigorous process to ensure that wind energy proposals are given the necessary scrutiny to ensure that protected wildlife are put at a minimal risk?

Mr. HALL. In those areas where there is not a Federal nexus, we have encouraged and have been working with the wind industry for at least 10 years that I am aware of as a person in the Fish and Wildlife Service, and longer, but we simply cannot require them to allow us to sit down if there is no Federal nexus and it is before the fact.

Ms. BORDALLO. Mr. Glitzenstein, could you please respond to that?

Mr. GLITZENSTEIN. Yes, thank you. I actually would take a more expansive view of the Service's authority. I think that since the Migratory Bird Treaty Act, I think as you pointed out in your opening statement, clearly forbids taking migratory birds by killing them wind turbines and that sort of thing. I think the Service, if it wanted to, could accomplish much more comprehensive protection in a number of ways.

One thing it could do is put out the guidelines that it has suggested to the public, and say that if these guidelines are not followed, then we will in fact bring appropriate civil and criminal enforcement action. I think it would get the attention of the wind power industry a lot more quickly if you said that failure to comply

with those kinds of guidelines would in fact result in some kind of meaningful enforcement.

I have to take a bit of issue with Mr. Hall. He is absolutely right that on some occasion there have been efforts to refer with respect to the California turbines to the U.S. attorney's office and there was no prosecution. The Service does have pretty broad civil enforcement authority, however, and I believe under the MBTA the agency could go in and ask that those facilities not be built unless they were being operated in a way that would avoid wildlife impacts.

So I understand the concerns that Mr. Hall is suggesting, but I think that if the agency really wanted to get better compliance with those kinds of guidelines there are ways they could do that under existing law. But the fact of the matter is they made clear they are not going to do that and I think that counts in favor of further action by Congress.

Mr. HALL. If I might just clarify—

Ms. BORDALLO. Mr. Hall, yes.

Mr. HALL.—for the record. There is no civil penalty under the MBTA. There is a civil penalty under the Bald and Golden Eagle Protection Act, but not under the Migratory Bird Treaty Act, only criminal.

Ms. BORDALLO. Let me ask this, Mr. Hall. Short of a mandatory process, is there any way then to ensure the kind of evaluation that you say is necessary?

Mr. HALL. In any law enforcement function, whether it is the cop walking the beat or the kinds of things we are talking about, the overall objective is voluntary compliance. Now if they don't, then you really should have some means of ensuring that the public's interest is looked after. When I look at the MBTA or our attorneys do, I am not an attorney, but when we look at the MBTA, and the Bald and Golden Eagle Protection Act, I have to defer to them to tell us what they think that our authorities are, and our guidance so far has been we can't really require anything to happen until a violation has occurred.

Ms. BORDALLO. So you really don't have an answer. Dr. Fry, did you want to comment on that?

Mr. FRY. Well, the Fish and Wildlife Service says they don't have any authority until a violation has occurred. Excuse me. Violations occur routinely and no enforcement has been brought by Justice or by Fish and Wildlife Service. So, of course, if the industry has been given a green light to kill as many birds as necessary or as unavoidable or as convenient, then they are not going to comply with anything, and the idea of having voluntary guidelines with no teeth at all just—it is not tenable.

This is the only energy sector that is unregulated, and Members of Congress are upset about it in their own districts. The environmental community is upset about it. We would like green energy. You know, nobody really wants mountain top coal, which really does a lot of damage, but you really have to enforce some laws. You have to put teeth in something or the industry is just going to go on as though nothing were happening.

Ms. BORDALLO. Well, I certainly agree with that.

Dr. Glitzenstein, do you have a comment on that question I just asked Mr. Hall?

Mr. GLITZENSTEIN. I believe again that if there is not some step taken to hold the industry's feet to the fire in some fashion, there is not going to be any change, and I think it does reenforce what I mentioned in my opening statement, which was if the Service is not going to be prepared to bring enforcement action for whatever reason, because they can't do it or because the U.S. attorney's office won't prosecute if it is referred to the U.S. attorney's office, then I think counsel is in favor of an additional enforcement mechanism in the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act, allow for citizen enforcement.

I can assure you that if there was an opportunity for some kind of citizen oversight—this is not a radical proposition, we have this in virtually every modern environmental law, the Clean Water Act, the Clean Air Act, the Endangered Species Act—I can assure you that very quickly the wind industry companies would pay a lot more attention to the requirements of those statutes.

So if the Service feels that it can't do it or won't do it, then I think there are alternatives that the Subcommittee would be wise to look at.

Ms. BORDALLO. Thank you. Thank you very much.

I would like now to recognize the Ranking Member, Mr. Sali.

Mr. SALI. Thank you, Madam Chair.

Mr. Fry, you had given the statistic that the wind turbines could—at the potential that I guess is on the table right now—account for one to two million bird deaths per year.

Mr. FRY. Yes.

Mr. SALI. You are the one that made that testimony?

Mr. FRY. Yes.

Mr. SALI. In the GAO's report from 2005, they listed five major sources of bird mortality, and one is office windows that apparently account for at least 100 million, maybe a billion bird deaths annually.

In terms of scale, is your organization doing anything to stop what is a much greater problems in terms of siting buildings?

Mr. FRY. There are non-governmental groups working on glass buildings. Clearly, that is a problem. I would like to say that we are not going to solve our energy crisis by building new power plants. We are going to have to do conservation, and if you don't want glass buildings to kill birds, turn the damn lights off.

The birds are attracted to buildings at night because they are lit up, and you can save energy, you can save money, you can save birds by just turning the lights off, and organizations like the group called FLAPP in Ottawa, Canada, publish brochures and work on this issue.

American Bird Conservancy has worked on other issues primarily, but we do work with FLAPP and we do have the Bird Conservation Alliance, which has worked on tall buildings. We have worked with communications towers which are another—

Mr. SALI. Am I correct that your organization has a lawsuit going to stop the building and maybe remove cell towers, is that correct?

Mr. FRY. Very specific ones on the Gulf coast of the U.S., yes, and—

Mr. SALI. Well, how about domestic and feral cats that account for hundreds of millions of bird deaths every year, would your organization want to outlaw cats too?

Mr. FRY. We have a program called "Cats Indoors". We have been working with the Fish and Wildlife Service and with coastal communities around the northeast and in California to eliminate feral cats. The Fish and Wildlife Service does not want to get into the business of irritating cat owners by destroying feral cats, and I understand the political—

Mr. SALI. Well, what about domestic cats though too—

Mr. FRY. Domestic cats, feral cats—

Mr. SALI.—do you think all cats ought to be kept indoors?

Mr. FRY. If you kept the cats indoors, they wouldn't be killing birds.

Mr. SALI. OK.

Mr. FRY. That is the Cats Indoors Program.

Mr. SALI. How about cars and trucks that the GAO says accounts for about 60 million bird deaths every year, do you want to outlaw cars and trucks?

Mr. FRY. I understand all of these things contribute to the death of birds, and that is why I did preface my remarks by saying 25 percent of all the bird species in this country are declining. They have been declining significantly since we started doing the breeding bird survey in 1966. That bird survey was instituted because DDT and dieldrin were killing a lot of birds, and the habitat loss from agriculture, whatever, there are lots and lots of habitat fragmentation causes—urbanization that caused the loss of birds.

But all of the effects are cumulative so that if you have an avoidable process of killing birds—

Mr. SALI. But wouldn't you agree that these other causes of bird deaths are many, many—hundreds of times as many bird deaths per year. While I would agree with you that we certainly shouldn't have a Federal or state policy anywhere that results in unnecessary bird deaths, wouldn't you agree that there is a need for a reasonable approach to this? If we eliminated every single bird death from wind turbines, so what? The cumulative total from all these other causes is so much greater it would be an unnoticeable difference. Would you agree with that?

Mr. FRY. No, I don't. I don't think it would be an unnoticeable difference.

Mr. SALI. So you think that one to two million that we might save if we got rid of every wind turbine—

Mr. FRY. No, no, no, I don't say got rid of. I say work with the industry so the industry reduces the number of birds killed. The industry has no incentive now to not to kill birds, none at all. There is no enforcement mechanism in their way that bother them. There is cause, whatever.

Mr. SALI. But the states have the authority to site these in places, and I think we would have to agree that the state has the authority to say, no, you can't build it here if they have a concern, and I guess my point is maybe the states are taking a reasonable approach here because there are just so many birds that are killed by other—I mean, if you have a billion birds that are killed by collisions with office windows, if you got rid of all one to two

million deaths from the wind turbine problem, then who would notice?

Mr. FRY. I guess if you are concerned that we kill a billion birds with office windows, why is the Natural Resources Committee not doing anything about killing birds at windows?

Mr. SALI. OK, now we are talking. But my point is, isn't it unfair to the wind energy industry to just focus on these turbines when there are so many other things that perhaps we should be focusing on to address your concerns?

Mr. FRY. Well, I think you have to work on all of the environmental issues simultaneously, and we are a small organization. We are not going to take over your responsibility for maintenance of the environment, you know, on all things. We have to work on specific and specific places. Wind energy is one of them.

You know, this started out as a very green industry. It has been taken over by BP, Shell, Florida Power & Light, GE, companies that work on the bottom line. They are no longer environmental communities. So you know, I would like to see some regulation to these large mega corporations, international corporations just the same way I would like to see meaningful legislation in coal, meaningful legislation in climate change, carbon question, a lot of different issues. I work on pesticides primarily. You know, I do wind on my days off. But the environmental community is fully committed to trying to do conservation, and I think it would be really nice to get Congress to participate.

Mr. SALI. You would agree with me though that if we conserved all of the energy from these wind turbines though, it still wouldn't reduce the number of bird collisions and deaths from office windows and those kinds of things, correct?

Mr. FRY. No. If you want to get rid of the collisions at office windows, turn the lights off. It is real simple.

Mr. SALI. Thank you.

Ms. BORDALLO. Thank you very much.

I have one final question. Mr. Kildee?

Mr. KILDEE. No, I have nothing.

Ms. BORDALLO. One final question, I guess, for Mr. Daulton. You note in your statement that the National Audubon Society supports the expansion of properly sited wind power facilities, and supports the Federal Production Tax Credit and Renewable Energy Standard.

Would Audubon also support conditioning these financial incentives to make their availability contingent upon wind power facilities being certified as some kind of a wildlife friendly standard?

Mr. DAULTON. At this time we are not prepared to support that, no. I think that that question needs to be considered within the context of some well-earned momentum that the wind industry has gained and its potential to offset global warming.

So I do think that something that is so important to the growth of the industry, like the Production Tax Credit, and they have gone through feast or famine cycles based on whether the Production Tax Credit is in place or about to expire, and gets renewed, they have gone through those kinds of feast or famine cycles. I think it is so critical to that industry and in turn to solving global warming

that we do need to be careful about ways in which we bring regulatory frameworks into that tax credit.

That said, we are absolutely committed to improving bird protection in this area and would welcome discussion of any policy options, including that one.

Ms. BORDALLO. Just to follow up. Are the various types of available mitigation actions cost prohibitive? In other words, would they raise the cost of compliance so high as to cancel out the financial benefit of the tax credit?

Mr. DAULTON. I don't think so. I do not think that mitigation options are so cost prohibitive that they would cancel out financial benefits for the wind industry. No.

Ms. BORDALLO. Are there any other answers to that from the panelists? Care to comment on that?

Mr. FRY. I don't have information on the cost of the compliance.

Ms. BORDALLO. On the cost, yes.

Mr. FRY. I also do agree that it would not be cost prohibitive. I think that the tax credits are something that the industry finds are absolutely essential for development. Well, I think if something is absolutely essential for development, it is a great thing to put an amendment on to make them comply environmentally.

Ms. BORDALLO. All right. Any other comments?

Mr. ARNETT. Just wanted to point out on some mitigation issues from a research perspective and some things that we have found out. I mentioned earlier that curtailment of operations is a possible mitigation strategy which clearly would have an impact on number of kilowatts produced during certain periods of time, and would have some level of financial impact.

But one thing I want to point out that our science is starting to show, although there is very little information, what we have seen is a pattern of bat fatalities in particular as it related to lower wind periods, and periods of the late summer and fall, particularly in this region that are generally the low wind periods, if you will, for this region. So our science is trying to understand the predictability of those periods to mitigate or to minimize the costs of those types of mitigation strategies.

They haven't been implemented as of to date. They need to be implemented immediately and test these experimentally to understand the reductions and fatality and the economic costs so we can put all of this together for the information we need to make these kinds of decision.

I can say that conceptually BCI certainly supports linkages of standards and best practices that are developed among multiple stakeholders to do things like the Production Tax Credit, renewable portfolio standards, and other things, but obviously we need to move forward at the science and get better information to understand those issues.

Ms. BORDALLO. Thank you. Thank you very much, Mr. Arnett.

Just for the record, my district is Guam, Territory of Guam, and we have quite a few bats in that part of the world. However, our bats are a little bit different than other bats from the United States and around the world. They are bats that feed on fruits, tropical fruits, and they are a delicacy in our territory. So I have

been listening with a great deal of interest to the comments that were made today, but I just wanted that to be placed on the record.

[Laughter.]

Ms. BORDALLO. So I thank all the witnesses for their participation in the hearing today, and members of the Subcommittee may have some additional questions for the witnesses. We will ask you to respond to these in writing, and the hearing record will be held open for 10 days for these responses.

If there is no further business before the Subcommittee, the Chairwoman again thanks the members of the Subcommittee and our witnesses. The Subcommittee stands adjourned.

[Whereupon, at 11:59 a.m., the Subcommittee was adjourned.]

[A statement submitted for the record by Mr. Brown follows:]

**Statement of The Honorable Henry E. Brown, Jr., Ranking Republican,
Subcommittee on Fisheries, Wildlife and Oceans**

Madam Chairwoman, I compliment you for the creative title of this oversight hearing. It apparently refers to a obscure movie that was filmed in the late 1930's. After looking at the witness list, I full expected we would hear testimony from Rhett Butler and Scarlett O'Hara.

Two weeks ago, we heard that carbon emissions are the greatest crisis facing mankind. While I suspect many people would find that statement an exaggeration, today, we have an opportunity to do something about that problem by examining the impacts of a clean, renewable and safe alternative energy source.

Onshore wind power is growing at a rate of 22 percent each year and it provides electricity for 8 million Americans. More importantly, wind turbines produce no waste, they require no external fuel and they create no air, water or noise pollution. Unlike other fuels, they do not emit any carbon dioxide, nitrogen oxides, sulfur dioxide or mercury into the environment. In fact, the existing U.S. wind turbine fleet displaces more than 19 million tons of carbon dioxide each year. To generate 1 megawatt of wind for 20 years, we would need to burn 29,000 tons of coal or 92,000 barrels of oil.

Nearly two years ago, the General Accounting Office submitted a report on the impacts of wind turbines on wildlife. While the GAO found that a wind farm in Northern California and West Virginia were killing certain birds and bats, their fundamental conclusion was that: "In the context of other avian mortalities, it does not appear that wind power is responsible for a significant number of bird deaths".

More recently, the U.S. Fish and Wildlife Service has solicited names of individuals to serve on the Secretary's Wind Turbine Advisory Committee. These experts will provide advice, guidance and recommendations to minimize impacts to wildlife relative to land-based wind energy facilities.

While I know that this hearing will not focus on the Cape Wind Project in Massachusetts, I found it interesting that a senior staff member of Greenpeace noted that: "House cats in Hyannis kill more birds than this wind farm ever will".

Madam Chairwoman, we do not have to choose between onshore wind power or bird protections. In fact, I agree with the sentiments of the President of the National Audubon Society that: "Our challenge is to help design and locate wind-power projects that mitigate the negative impacts on birds".

While we may not have wind farms in South Carolina, if we are ever going to get serious about developing alternative energy sources, wind power must be part of the solution. We can produce this safe, clean and renewable source of energy without killing large numbers of birds and bats. We can accomplish that by strengthening siting standards and by conducting pre-construction and biological surveys. Our energy policy can no longer be—simply saying NO—to each and every energy source.

I look forward to hearing from our witnesses and I am anxious to hear how wind power and wildlife can co-exist in the future.

Thank you, Madam Chairwoman.

[A statement submitted for the record by the Alliance to Protect Nantucket Sound follows:]

**Statement of Charles C. Vinick, President and CEO,
Alliance to Protect Nantucket Sound**

Dear Chairwoman Bordallo and members of the Subcommittee, on behalf of the Alliance to Protect Nantucket Sound (Alliance) I would like to submit the following testimony for the record. The Alliance is a nonprofit environmental organization dedicated to the long-term preservation of Nantucket Sound. An area of water hugged to the North by Cape Cod and to the South and East by Martha's Vineyard and Nantucket Island, Nantucket Sound is a rich and diverse biological community. It serves as habitat for numerous species of Seabirds and is within the foraging and migratory route of multiple bat species. Our goal is to protect Nantucket Sound, and its wildlife resources, in perpetuity through conservation, environmental action, and opposition to inappropriate industrial or commercial development that would threaten or negatively alter the coastal ecosystem.

Background

Wind energy projects have been documented to negatively affect both the avian and bat populations that reside in, and migrate through, areas containing wind turbines. Wind energy production may affect birds in three ways: 1) fatalities, as experienced among a wide variety of bird species, resulting from collisions with rotors, towers, power lines, or with other related structures, or electrocution on power lines; 2) habitat fragmentation; and 3) the direct impacts on bird habitat from the footprint of turbines, roads, power lines, and auxiliary buildings. This is a problem for both onshore and offshore turbine energy projects located in areas of concentrated bird and bat activity.

There are a number of environmental concerns associated with birds and wind turbines. One of the key concerns is mortality or other effects on birds listed as protected species under international, federal, and state legal authorities. There also are concerns about local or regional population impacts, as well as cumulative impacts on species at national and regional scales. The increase in the number of wind turbines associated with individual projects, as well as the height and size of each turbine, has also elevated the level of avian impact.

Bat mortalities caused by wind turbines have been observed throughout the U.S., with the highest levels occurring in the Eastern United States. Generally, bat mortality is highest in the late summer and early fall, a period which is thought to coincide with large levels of bat migration. Migrating bats are thought to be most threatened by turbines because research shows that they may navigate during migration without the use of echolocation, which would otherwise help them to avoid turbines and related structures. In addition, there is some indication that bats may be attracted to turbines, confusing them for traditional roost sites. Historic records reflect that, whether over land or water, bats appear to seek out relatively tall structures for overnight roosting.¹ Thus tall turbines can be mistaken for tall trees and increase the potential for turbine-bat collisions as the structures lure in the bats.

The correlation between wind energy development and impacts on avian and bat populations is an issue that has been receiving an increasing amount of attention in recent months. In addition to this hearing, numerous other studies have either begun or been completed. In May 2007, for example the National Research Council released a report titled Environmental Impacts of Wind-Energy Projects. The report notes, "environmental influences of wind energy facilities can propagate across a wide range of spatial scales, from location of a single turbine to landscapes, regions, and the planet, and a range of temporal scales from short-term noise to long-term influences on habitat structure and influences on presence of species."² It has become increasingly clear that wind turbines have a direct effect as well as an indirect effect on avian species.

¹This is evident from the historic records of red bats landing on ships at sea off the coast of New England, and reports of these bats colliding with tall anthropogenic structures on shore and roosting in trees at inland sites.

²National Research Council; Prepublication copy of Environmental Impacts of Wind-Energy Projects (2007) Pg 49. Last accessed on May 11, 2007 at <http://books.nap.edu/catalog.php?record-id=11935>.

The Need for Mandatory Guidelines

In recognition of the relationship between bird and bat mortality and wind energy facilities, various guidelines have been developed for the permitting of such facilities.

For example, in April 2007, the California Energy Commission and California Department of Fish and Game released a draft staff report, titled *California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development*. The guidelines include recommendations on preliminary screening of proposed wind energy project sites; pre-permitting study design and methods; assessing direct, indirect, and cumulative impacts to birds and bats in accordance with state and federal laws; developing avoidance and minimization measures; establishing appropriate compensatory mitigation; and post-construction monitoring, analysis, and reporting methods. Perhaps the most comprehensive guidelines, however, are the U.S. Fish and Wildlife Service (FWS) "Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines" (May 2003). See Attachment 1.³ The voluntary guidance is intended to assist FWS staff in providing technical assistance to the wind energy industry to avoid or minimize impacts to wildlife and their habitats. It does this through: 1) aiding in the proper evaluation of potential wind energy development sites; 2) promoting the proper location and design of turbines and associated structures within sites selected for development; and 3) specifying pre- and post-construction research and monitoring to identify and/or assess impacts to wildlife. One of the most important provisions of the Interim Guidelines calls for three consecutive years of radar data for site-specific projects.

Unfortunately, voluntary guidelines are only as effective as each developer's willingness to abide by them. The Cape Wind Project proposed for Nantucket Sound is an example of the problems that result when wind developers choose to ignore the guidelines and proceed with insufficient data. The project is also an example of why mandatory, rather than voluntary, federal requirements are necessary.

Land surrounding Nantucket Sound serves as a breeding and feeding ground to many different species of birds, including globally significant populations of the federally protected piping plover, an endangered species. The area also provides habitat for other federal and state endangered species such as the roseate tern and peregrine falcon. The U.S. breeding population of roseate terns was declared endangered in 1987. In recent years, nearly 90% of the Northeast U.S. breeding population nested around Cape Cod. An estimated 500,000 sea ducks winter in Nantucket Sound, the highest concentration of wintering ducks in North America. The Sound is home to common eiders and black scoters. The area is part of the Atlantic Flyway—a major migratory bird route and generally abounds with birds vulnerable to wind energy development.

There is currently a complete absence of site-specific bat data for Nantucket Sound.⁴ It is, therefore, impossible to state with certainty the bat population of the area at this time. However, Nantucket Sound is well within the migratory range of eastern red bats, hoary bats, and silver-haired bats and the nightly foraging ranges of other species that occur in New England. This suggests that wind turbine construction in the area may also have a significant impact on bat populations.

It is in this avian sanctuary that Cape Wind Associates have proposed to construct an industrial sized wind complex. The proposed Cape Wind project is likely to have a significant impact on avian species in the Nantucket Sound area. It is slated to have 130 wind turbines each 440 feet high spread over 25 square miles.

For over five years, FWS and other parties have called upon Cape Wind Associates to conduct the research called for under the FWS Interim Guidelines, especially the three years of radar data so that the impact of the proposed project can be adequately assessed. See Attachment 2. These studies are necessary, practicable, and reasonable. However, they have not been conducted, due to the recalcitrance of the project developer. The studies that Cape Wind has conducted are insufficient as a basis for biological assessment. For example, Cape Wind's widely criticized "visual observations" of birds in Nantucket Sound produced a count of 365 "targets" in the "rotor-swept area" of the project over a single day of observation in September, 2002. A radar study of the same zone and time period, however, reported 11,156 "targets." This great disparity shows the clear need for reliable data and studies, and the need for mandatory requirements for their collection. The necessary studies could have been conducted at a reasonable cost and would have been completed well

³Attachment 1 includes only the interim guidance document. The full document including guidance and technical appendices for implementation are available at <http://www.fws.gov/habitatconservation/wind.pdf>. Last accessed on April 27, 2007.

⁴Despite repeated requests, the Wind project proponent has refused to conduct the necessary site-specific studies necessary to obtain actual population data.

in advance of agency review for permitting purposes, had Cape Wind followed the FWS Interim Guidelines and agency recommendations. Unfortunately, Cape Wind's responses are dismissive of the serious impacts that the project is likely to have on endangered and threatened birds and in no way provide federal agencies with the scientific data or relevant information that they need to make legal and regulatory determinations about the project. Prior to permitting, large-scale projects such as Cape Wind must be required to complete studies of bird and bat impacts that provide complete and useful data to aid agency decisionmakers in the permitting process. If the Subcommittee is serious about the protection of birds, the now voluntary FWS guidelines must be made mandatory.

The Department of the Interior is currently forming a "Wind Turbine Guidelines Advisory Committee" for the purpose of developing permanent guidelines, and providing additional advice and support. See Attachment 3. The Alliance asks Congress to encourage the speedy development of these guidelines and to insist that the guidelines include minimum site-specific data collection standards. In addition, Congress should pass a law that prohibits any wind project, including currently pending projects, from being authorized, onshore or offshore, unless either the FWS guidelines have been satisfied or FWS makes a finding of no significant impact.

Adaptive Management is Not the Solution

The Wind industry has advocated for adaptive management to be the primary response to the need for more avian information and the lack of a current mitigation strategy. The mentality is "build now and mitigate impacts, to the extent possible, later." But historical evidence suggests that wind projects have the potential to wreak havoc on bird and bat populations. Relying on adaptive management as alternative to adequate preconstruction studies and mortality avoidance is particularly problematic for raptor and bat populations, which have slow reproductive cycles and low reproductive rates. Impacts to these populations are long-lasting and once harmed, they cannot quickly recover. Resource stewardship requires more protection than the "build now, fix later" philosophy would provide.

Congress cannot allow adaptive management to be used as a substitute for necessary pre-construction data collection. Congress needs to mandate that agencies responsible for the review of individual projects rely on the precautionary principle and deny project permits in areas of significant importance to avian species, including migratory bird routes until the government can establish that post-construction mitigation efforts are successful. If a location on a migratory bird route is good for developing now, it will be good for development later, after the government has a better understanding of the viability of mitigation options.

Conclusion

While further research is greatly needed to understand the threat that wind energy poses to bird and bat populations, as well as to understand how to mitigate such impacts, it is clear that there is a direct correlation between increased bird and bat mortality and wind energy facility construction and operation. It is also clear that congressional action is needed to remedy the situation. The Alliance urges the Subcommittee to mandate compliance with the FWS guidelines for wind energy development and to require reviewing agencies to rely on the precautionary principle and not adaptive management, in the absence of necessary resource and impacts data.

