



**Testimony of Mike Daulton
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**Before the Committee on Natural Resources
Subcommittee on Fisheries, Wildlife and Oceans**

Impacts of Wind Turbines on Birds and Bats

May 1, 2007

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 US Geological Survey, the US 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.

今年発生したヤンバルクイナの交通事故

1月2日(月):国頭村、県道2号(9.4km ポスト付近)で死亡個体(若鳥?)を発見。

3月20日(月):国頭村、国道58号(座津武-宇嘉間)で傷病個体(成鳥)を保護。同日死亡。

4月21日(金):国頭村、県道2号(5.14 kmポスト付近)で死亡個体(ヒナ)を発見。

4月29日(土):国頭村、伊楚林道(楚洲の林道終点より1km 付近)で死亡個体(ヒナ)を発見。

5月9日(火):国頭村、安田漁港敷地内にて成鳥の死骸発見。

5月7日(日)に死亡したと推定される。

5月10日(水):国頭村、安田にて死骸発見。

5月7日(日)に死亡したと推定される。

5月28日(日):国頭村、県道70号線(12.8km ポスト付近)でまだ温かい成鳥の死骸発見。

6月2日(金):県道2号線(15.2km ポスト付近)、安田集落より約1km 地点にて傷病個体(成鳥)を保護。6月3日死亡。

6月4日(日):国頭村伊部、村道路上にて死骸発見。

6月22日(木):国頭村、国道58号線(奥-辺戸間、4.8km ポスト付近)にて傷病個体(メス成鳥)を保護。7月11日放鳥。

8月24日(木):国頭村、県道70号線(13.8 ~ 13.9 kmポスト付近)で死亡個体を発見。

11月22日(水):国頭村、安田にて死骸発見。

12月11日(月):国頭村、県道70号線(12.4 kmポスト付近)で死亡個体を発見。