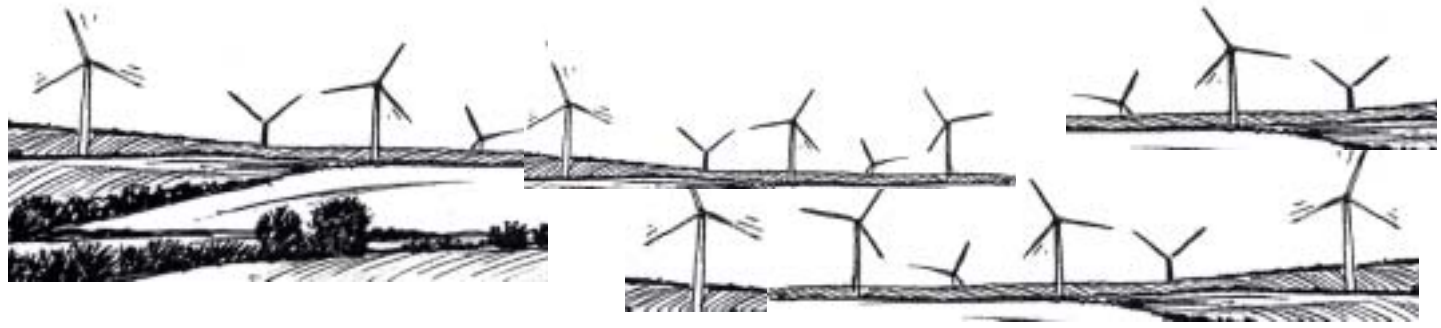
By Janna Bialek

How Green Will the Wind Blow?



Imagine driving from Washington west across Maryland to the hills of West Virginia. Sprawling suburbs give way to rural towns, farms give way to sprawling, forested mountain slopes. The countryside's huge coal fields are carefully hidden from view, but this is not: a string of towering, gleaming white wind turbines, lining the mountains' ridgeline like vertebrae.

Whether you see these as an eyesore—one West Virginia newspaper called them "no better than billboards," or a symbol of the battle against global warming, is up to you. But one thing is clear in many minds: no matter how you feel about wind energy, our dependence on electricity from coal has to stop. From blasting off the top of mountains (and using stream valleys to contain the rubble) to the old, sooty, acid-rain producing smokestacks used to burn it, electricity produced by coal is bad news for everyone.

Nearly half of our nation's electricity is fueled by coal, and our increasing hunger for power could result in as many as a hundred new coal-fired power plants spread across 36 states—at a cost of nearly 50 percent more greenhouse-fueling CO_2 emissions. Along with these plants come a host of other problems, both global and local: sulfur dioxide (68% of the nation's total sulfur dioxide pollution was from coal-fired power plants in 2001), and heavy metals—notably mercury—in the air; huge slag heaps that destroy mountain stream ecosystems; entire landscapes in which small towns sit powerless at the hands of huge, federally-blessed coal interests; countless deaths from injury and exposure to toxic by-products. And these are just the human tolls.

Birds are killed on power plant smokestacks—3,000 on one night alone at ONE power plant in Florida. Coal extraction has destroyed 380,000 acres of eastern forest habitat for birds like the cerulean warbler and others in the past 10 years, according to the American Bird Conservancy; that same amount will be lost again in the next 10 years if our dependence on coal continues, as it's likely to do in the face of population growth projections.

For decades, environmentalists have been calling for an alternative to this energy picture—a decentralized, sustainable energy future that relies on renewable energy sources rather than fossil fuels. At last—with the cost of relying on foreign oil, the public outcry against the current Administration's concessions to dirty energy industries, mounting concerns about global climate change, and technical advances that increase output and decrease cost—at least one renewable may be ready to make a dent in our energy supply: wind.

There are currently 16,000 wind turbines in the US—mostly in Western states with wide-open landscapes or in California, which is historically ahead of the game in adopting environmental technologies. In addition, more than 14 states have renewable energy portfolio standards which require a mix of renewable sources in the state's energy purchases. This enforced demand—along with lucrative tax breaks and financial incentives—has the wind energy industry ready to match a steady supply of wind with a steady and growing hunger for electricity.

According to a *Mother Jones* article in the summer of 2002, technical advances and economies of scale, in addition to lucrative tax incentives, have made wind competitive: three to six cents per kilowatt hour, as opposed to two to five cents for conventional fuels. These savings are in part due to the availability of technology capable of ramping up turbine size to industrial scale and taking advantage of relatively steady wind speeds in places like mountain ridge tops. (Offshore wind energy, although popular in Europe, seems stalled in this country over the issue of offshore scenic vistas.) And wind, placed in the right location, is far more predictable than foreign oil, the article argues.

The race to wind energy can hardly be characterized as swift, however, or even new for that matter. In the 1880s, more than 1,000 working wind turbines brought power to mills, farms, and families on Cape Cod; by 1930, the world's largest turbine was operating in Vermont. By 1985, California responded to perceived future energy shortfalls by hastily constructing 1,000 megawatts of wind capability at Tehachapi and Altamont passes. By 1990, the state produced half the world's capacity of wind energy; by 2000 this lead had slipped, replaced by the European Union (mostly Germany and Spain). Although many factors have stalled the wind energy industry's takeoff—not the least of which is the heavy influence of the coal extraction and power plant industries—one additional factor may have been involved: the wind farm in California's Altamont pass was critical migratory habitat for golden eagles, proving disastrous implications for raptors. Mortalities are still high at this site: its old-design turbines—fast moving, supported by wire structures that confuse and trap birds, and illuminated by lights that attract them—have to some extent been re-tooled, but many feel that the site is simply wrong. A recent study prepared for the California Energy Commission on reducing avian mortalities at Altamont found that, in part because they fly at lower heights and are more subject to collision between 881 and 1,300 raptors are still killed each year at Altamont, including 75 to 116 golden eagles. Other raptors affected include red-tailed hawks, American kestrels, and burrowing owls. Complicating the picture is the presence of a steady population of ground squirrels—raptor prey—that make their homes in the rock piles created from turbine construction.

As they say in the real-estate business, location is everything.

Now that the country seems poised to consider adding wind energy as a meaningful component to our energy resources, it is crucial to ensure that we learn from mistakes. "There is a lot we *do* know about making wind turbines compatible with birds," remarks Gerald Winegrad, Vice President for Policy at the American Bird Conservancy (ABC). "Lighting, proper support structures, decreasing the footprint of these sites can all go a long way in lessening the effects of wind turbines," particularly in relation to other forms of energy.

Winegrad, who spearheaded the Wind Energy Policy for ABC, is an unapologetic opponent of what he calls "Big Coal," and is hopeful that wind can, at least in small part, offset its effects. "If you go into Appalachia and see how carelessly and callously coal companies treat the countryside, and how this policy causes incredible losses in habitat, streams, and even entire mountaintops just to feed our coal consumption—the cost is amazing and depressing. We need to look at the big picture," he goes on, "at how we're going to feed our incredible hunger for the electricity that supports our lifestyle, and not kill people, and birds, and bats, and other creatures doing it."

Winegrad knows of what he speaks—he has sat for years on task forces to evaluate risks to birds from all kinds of man-made structures, but particularly from communications towers. He feels that the wind industry, unlike others that have refused to make concessions to save birds, works hard to preserve its 'green" image. He cites the communications industry as one of the worst offenders: their 70,000 towers continue to kill 50 *million* birds each year, even though measures can be taken to prevent these losses. "Studies done at Mountaineer, for example," he says, citing a plant that resulted in the loss of 475 bats during one bad weather event and thousands more on subsequent nights, "did more to help us understand migration research and mortality than an entire decade of work by the telecon industry."

The bat mortality incident pointed to how little is known about the ways bats migrate and behave, particularly around wind turbines, and a coalition of wind energy representatives, government agencies, and Bat Conservation International (BCI) has hired a full-time biologist to better understand bat interactions before its too late to take remedial measures. Merlin Tuttle, president of BCI, worried in the Summer 2004 issue of *Bats* magazine that bat loss may prove huge if a buildup of wind energy were to occur. "If the kill rates from the 44 turbines at the Mountaineer site were scaled up to the proposed level of 410 turbines planned for Appalachian ridges, the turbines alone could kill more than 30,000 bats in a single season," he wrote.

Little is known about large scale effects of a buildup of wind energy on the mountain ridges of the East, and many worry that casting our fate to wind [energy] may have catastrophic effects on wildlife. Although, as ABC's policy statement reminds us, "all energy choices have implications for birds," understanding what those implications are, and mitigating them as much as possible before industrial scale wind

investments are made, seems the prudent course.

Optimism that wind energy and wildlife can coexist on the mountain ridges of western Maryland is not universally shared, however, in part because the windy ridges that make wind power so successful are also what fuels migration. According to Chan Robbins, author of *Birds of America* and *Birds of Maryland and DC*, as well as the *Atlas of the Breeding Birds of Maryland and the District of Columbia*, nearly all the hawks and eagles that nest in the northeast US and Canada migrate through the western portion of Maryland.

"We have no clue as to how many birds will be killed by wind power, " Robbins worries, "and relying on industry data is not the best way to know." The real implications, he worries, could be ten, a hundred, even a thousand times current estimates—but without scientifically supported studies, we just don't know.

The dangers of wind energy to migrating birds—not just raptors but songbirds as well—are currently being played out all along the ridges of the Maryland/Pennsylvania/West Virginia Appalachians, where proposals for upwards of 700 individual turbines are in various stages of development. And perhaps nowhere are the complexities of wind power, and its political and biological pitfalls, more evident than with the Synergics Energy proposal to build 20 to 23, 380-foot tall wind turbines on Backbone Mountain in Garrett County, Maryland.

Follow Backbone Mountain's west side, and you'll find a mostly green swath of largely contiguous second-growth forest—a canopy at times so continuous as to provide enough habitat for the state-endangered mourning warbler—in fact, the only confirmed nesting area in the state, according to the *Atlas of the Breeding Birds of Maryland and the District of Columbia*. But the mountain's eastern slope offers a completely different story—a bleak terrain littered with mountains of coal slag, a denuded landscape where once lay continuous forest habitat.

To lay the groundwork for the Roth Rock project—so named for its proximity to the Roth Rock fire tower—Synergics applied for a permit with the Maryland Public Service Commission, and hired Paul Kerlinger, former director of the Cape May Bird Observatory, to prepare an Avian Risk Assessment. Kerlinger has worked for a number of wind industry companies, and his research has lead to controversy—birding groups, including the Maryland Ornithological Society's policy committee, conservation biologists, and others have found inconsistent statements, conclusions unsupported by hard data, and a tone that downplays the impact of wind development and therefore undermines the legitimacy of his studies.

Chan Robbins noted in response to the report Kerlinger did for the Clipper Windpower project in Oakland, Maryland, that Kerlinger "grossly misrepresented the threat to migratory birds," ignoring and underestimating vital migratory data on the use of ridges by both raptors and songbirds. "Kerlinger writes that night migrants do not follow ridges, for example," Robbins said, "well, that's just not true." Other statements—that the effects of habitat fragmentation are unknown, and that migration numbers are inconsequential, are simply misleading, he notes. Robbins calls for "good, independent studies" to counter our present reliance on industry information.

Kerlinger's Avian Risk Assessment for the Synergics plant at Roth Rocks was based on, using language from the document, a literature search, interviews, and two days of observation in mid-July, 2003 (mid-July is not migratory season for any of the birds that should have been studied, and understanding the avian use of the site during migration and nesting seasons is paramount to assessing the impact of the project). The report's broad and unsupported claims—"no federally listed species were found on the site" (in spite of an attached letter from U.S. Fish and Wildlife Service (FWS) and the Maryland Department of Natural Resources noting concern for Indiana bat populations and 14 species on the State concern list, as well as the possibility of forest-interior nesting birds that would be affected by habitat fragmentation); and "there will be little impact on raptors;" that "most birds change direction when they see turbines and fly around them,"—did little to comfort those with concerns about bird/bat/wind interactions.

Site-specific information is crucial to good siting decisions for wind—although the Roth Rock site in no way compares to the scale and raptor concentration at Altamont, it is still important to better understand the key issues in siting on ridgetops and avoid irreversible mistakes. But instead of calling for more studies, as is suggested in guidance documents for wind facilities developed by the National Wind Coordinating Committee (an association of wind energy companies and others), the American Bird Conservancy, and the U.S. Fish and Wildlife Service, Kerlinger's assessments presume that if you don't see it, it isn't there. He writes: "few raptors collide with turbines during day migration," without providing the behavioral studies to support the statement, and that "the morning flight of songbirds is thought by some to be significant, but there is no evidence to support this," refuting the evidence of highly respected ornithologist Chan Robbins instead of calling for further observation to determine if, in fact, there might be a problem. (The claim is that migratory songbirds depend on ridgelines as they fly low at dawn—within range of turbines—in search of roosting places.) Further, Kerlinger points to results of assessments (his own) at other wind industry projects for more information on how risk will be played out at Roth Rocks, ignoring the need for site-specific studies to assess each individual project. In fact, he writes that sites like Roth Rocks are "nearly identical" to other projects like the Mountaineer facility, and that information from the study of the Allegheny Front Ned Power installation should be used to answer questions about Roth Rock.

His risk assessment also contains inconsistencies, for example, noting that "no parks or protected land or sensitive areas are nearby"—on the same page that he lists Monongehela National Forest, which is three to four miles away. Although he calls for further study of possible "state-listed endangered species," his recommendation falls short of calling for specifics, or how the company should address the impact that the project would have on the 14 species of concern to Maryland Department of Natural Resources, including the only known nesting site in the state for the state-endangered mourning warbler. The bird has been found consistently in Garrett County, the far southern reach of its habitat. Walter Ellison, Project Coordinator for the new, upcoming, five year Breeding Bird Atlas project confirms that data show the bird to be regularly found not just near the site—as Kerlinger states in his assessment—but actually on the road to the Roth Rock Fire Tower.

Kerlinger also downplays the possibility that the site contains foraging or migration habitat for the federally-endangered Indiana bat, referring the reader ironically to the post-construction studies at the Mountaineer site for more information. Yet the post-construction Mountaineer study, which Kerlinger conducted and which was actually much more extensive—monitoring from April through November, 2003—found higher levels of mortality than previously believed (69 carcasses of 24 species of birds were found, unadjusted for counter error). Even more disturbingly, 475 bat carcasses were found at the site during their migratory period—a number that, adjusted to reflect searcher inefficiency and scavenging, is in reality closer to 2,100 bats actually killed by the wind plant. (No dead Indiana bats were found, however.) In the Mountaineer study, Kerlinger recommended weekly searches at wind facilities, especially during migration. As far as we know, no recommendations for additional studies have been made to Synergics, even in light of evidence from studies conducted after the Avian Risk Assessment.

American Bird Conservancy, the Royal Society for the Protection

(Continued on page 6)

To find out more about wind energy and birds

Making correct choices about energy decisions is everyone's responsibility. Global impacts, local impacts, wildlife impacts, even security issues are all at stake as we consider energy options. Here are some resources to help you make up your mind about wind energy.

The ***American Bird Conservancy***, www.abcbirds.org, has a number of resources to better understand this issue. The homepage links to wind energy and birds, and includes siting guidelines for making wind energy bird-friendly. Another important link on this site is their study, "Birdwatcher's Guide to Global Warming" with state-specific impacts to birds from climate change and a joint report with the National Wildlife Federation on global climate change.

Although wind energy overseas has focused on offshore projects, the website of the ***Royal Society for the Protection of Birds*** offers an interesting take on the issue from another perspective. Go to www.rspb.org.uk and link to windfarms/policy/windfarms/.

The trade association for the wind industry, ***American Wind Energy Association***, has a search button to find their guidance and other studies on wind and birds. Type in "birds" and see their public responses.

A coalition of huge environmental organizations—Greenpeace, World Wildlife Federation, and Friends of the Earth—banned together to support wind energy in a group called **Yes2Wind**. Their site, www.yes2wind.com openly advocates for the wind industry, "debunking" the "myths" of wind and birds.

The citizen's group, **Friends of the Allegheny Front**, is working to bring awareness of wind issues to the people of West Virginia. Their website is www.friendsoftheallegheny front.org.

For guidance from the **U.S. Fish and Wildlife Service**, including the government's role in wind energy development and protecting birds, visit their website, www.fws.gov/r9dhcbfa/windenergy.htm.

Finally, if you'd like to keep up to date on the **Synergics** wind energy project on Backbone Mountain, keep an eye on the docket of the Maryland Public Service Commission, www.psc.state.md.us/psc/home.htm. Type in docket number "9008" for information on this permit application.

Wind Energy

Continued from page 5

of Birds, the National Wind Coordinating Council, the U. S. Fish and Wildlife Service, and two states (Washington and Kansas) have developed guidelines to help make sure that wind energy facilities are sited using the best possible science to avoid mortalities. But, aside from the state requirements, the guidelines are voluntary—unless a federally-listed endangered species is found. Indeed, although Maryland has a requirement for review from the state's Department of Natural Resources to see if wind projects impact species on its endangered list, many states—including Pennsylvania—do not. And even though the wind industry has worked with birding groups to come up with siting guidelines to reduce avian risks, wind companies don't always follow their own industry's guidelines, notes Chan Robbins.

ABC and FWS guidelines for siting wind energy facilities clearly state that careful choice of a site has a great deal to do with the post-construction impacts that wind energy will have on birds and bats, and that an adequate study is crucial to determining whether a site is suitable. While the Roth Rock Avian Risk Assessment states that the mountain upon which the proposed project resides does not serve as a concentration point for raptors, or as habitat that will result in "biologically significant" numbers of avian losses, such arguments lose weight when not supported by the direct, hard data accomplished through thorough pre-construction research, not just a two-day site visit.

What would it take to establish more scientific certainty of the impact of wind plants on songbirds, raptors, and bats? Chan Robbins proposes not only independent studies, but consistent, ongoing data. "They do random visits and think that's enough," he says. "We need daily checks. Without this, there's no way of measuring how many birds are killed—TV tower studies show that by dawn, birds that are killed in collisions are gone." Robbins proposes that daily observations by an independent body be done at a single operating turbine, checked each day at dawn, with transects laid out to occupy 1 percent of the total area. Multiply the number by 100 and you have some hard data.

Citizen Science Really, Really Works!

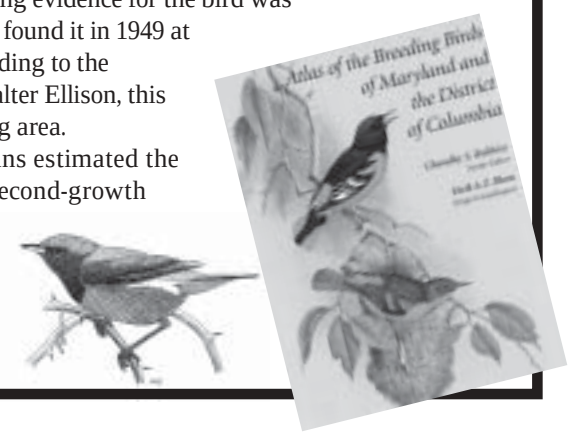
Wind energy and citizen science can be perfect companions—just look to the *Atlas of Breeding Birds for Maryland and the District of Columbi*a for proof.

This volunteer effort, which is the work of thousands of birders covering quadrangles in every single section of the state, is compiled every five years or so into one of the most comprehensive and large-scale bird efforts ever.

What does the Breeding Bird Atlas have to say about the mourning warbler? Called one of the "rarest breeding birds in Maryland," the bird's location is limited solely to Garrett County, with the only confirmed (in this case, the appearance of fledgelings from nesting habitat) siting at the Roth Rock area in the Table Rock quadrant. (The entire state is divided into a grid of 239 quadrants).

The mourning warbler is a late migrant—one of the last neotropical songbirds to pass through Maryland—migrating as late as the first week in June. The first nesting evidence for the bird was turned in by Chan Robbins, who found it in 1949 at the Roth Rock Fire Tower; according to the project's current coordinator, Walter Ellison, this is still the bird's preferred nesting area.

In the early 1950's, Robbins estimated the bird's breeding density in the second-growth forest of Garrett County's far western corner to be around 10 males per 100 acres.



The calls for more study of the impacts of a wind industry build-out on the Appalachian ridgetops reach across birding and conservation groups in our area. Last summer, even before the Mountaineer bat deaths, a coalition of 25 regional and national conservation groups, including National Audubon, the Endangered Species Coalition, and Defenders of Wildlife, called for the federal government to study wind power effects before construction geared up. Noting that "environmental reviews are happening in a very cursory manner," the coalition was trying to reign in companies that were rushing to bring wind power online before the expiration of the renewable energy tax credit. (With the failure of Congress to pass an energy bill, the tax credit is still in limbo as of press time; it may be grandfathered.)

Whether the coalition's prediction of "extensive wind power production" along Appalachian ridges will come true depends on whom you ask. When faced with the dire predictions of global warming and alarming death rates from toxic air pollution, many argue that wind power can't come soon enough—that the implications of burning fossil fuel for birds and wildlife are much more onorous. Others are more cautious, not trusting utilities to keep promises they have broken so often in the past.

Dan Boone, a conservation biologist, sees wind power as a chance to "finally get it right, to live sustainably," but worries that Appalachian ridges might not be the best option. "I ran data on wind capacity," he notes, "and found that we could easily be talking about 1,000 turbines along ridgetops—in just a three-state area alone. And these are industrial-scale; they'd have to be for industry to take the risk and build them." Too little is known, he worries, about the kind of collective habitat alteration this would bring to eastern mountains. "Without realistic assessments," he points out, "who knows that it won't be disastrous for birds, bats, and habitat loss?"

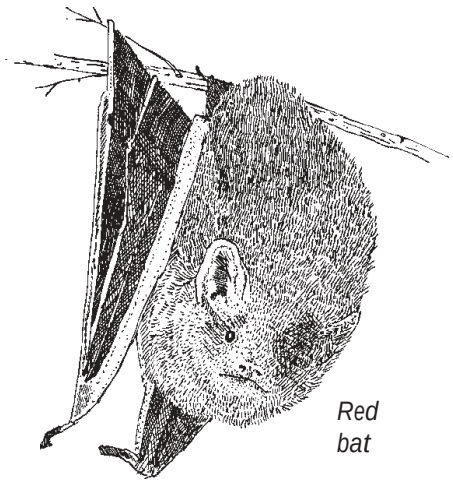
Boone has overhead photos of forest clearings as well as an assessment of radar studies done for the Mt. Storm wind project proposed for the Appalachian Front to back his concerns. The study, showing higher than expected numbers of birds passing through on migration, used sophisticated NEXRAD radar to target not only birds, but also the height at which they fly. Surprisingly, the data showed a potential night migration of 300,000 birds—flying at heights low enough to collide with wind towers (below 400 ft.)

But ABC's Gerald Winegrad feels that focusing on collisions with wind towers is disingenuous. "The truth is, any time man makes a structure, a bird will collide with it. Tens of millions of birds each year collide with communication towers, but where's the outcry?" he asks. "I'm no apologist for the wind industry—there are good guys and bad guys out there in all sectors of our economy. But on the whole, this is an industry that has a green reputation, one that gives them a definite PR advantage, and in my dealings with them, I think they understand the value of that." Winegrad points to two absolute necessities in making wind towers safer for birds: Don't use guy wires (supporting wires that kill birds by forming a disorienting maze) on any structures, including meteorological towers, and always use strobe lights rather than continuous or pulsing lights. "If you make sure those two items are nailed, you're making great strides in protecting birds."

There's another motive bringing people into the fray about wind energy—the impact turbines would have on the residents of the rural countryside. It's a battle drawn on classic lines—rural residents bearing the costs of supporting the electrical needs of those who live far away. The group Friends of the Allegheny Front is worried that 430 or more turbines are currently planned there, in addition to the 44 already operating at a Florida Power and Light facility on Backbone Mountain, West Virginia. The group feels that that economic and environmental benefits of wind are overstated, that the "windfall" subsidies—the production tax credit of 1.8 cents per kilowatt hour, and an accelerated depreciation rate that allows them to recover all costs in five years rather than the 20 years required of other energy sources—actually make it a tax shelter for power companies rather than an energy source with a realistic chance of being sustainable.

But the Friend's website points out a more troubling and complicated reason for opposing wind energy—one based on aesthetics and property values, not bird or bat mortality or habitat loss. In a state where tourism is closely connected to the perception of being in the middle of nowhere, the very prominent marking of ridgetops by a vertebrae of 400 foot

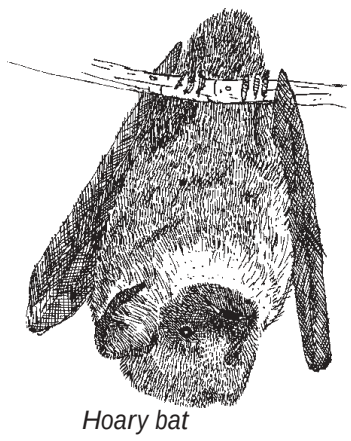
wind turbines definitely changes the picture. (So, one could argue, does the removal of entire mountaintops by strip mining, but coal operations tend to be neatly tucked out of view from highways and major roads, and can pretend, at least, to be reclaimable.)


Red bat

West Virginia residents have taken their complaints to their Congressional representatives, and have found at least a few sympathetic ears. A letter to the West Virginia Public Service Commission from Congressman Alan B. Mollohan of the 1st District complains that "companies such as NED Power [which proposes 200 turbines on the Allegheny Front] assemble finances . . . then sell to large power companies . . . [moving] on to the next deal [and] leaving West Virginia with hundreds of wind mills marring one of the most pristine wilderness areas in the country. What West Virginia receives in return is scant." Mollohan and Congressman Nick Rahall have called for the General Accounting Office to study the impacts of wind turbines on wildlife, with particular emphasis on the Migratory Bird Treaty Act and the Bald Eagle Protection Act.

The table seems set for confrontation, rather than consensus. Are the concerns over avian and bat implications real, and how much science is needed? It seems critical at this juncture to ensure that the data is solid, before mistakes are made. Downplaying the consequences arguably hurts both sides in the long run. There is, according to Gerald Winegrad, much to learn about raptor, songbird, and bat migration by working with the wind industry—which, by the way, has far greater resources than conservation groups—in finding answers.

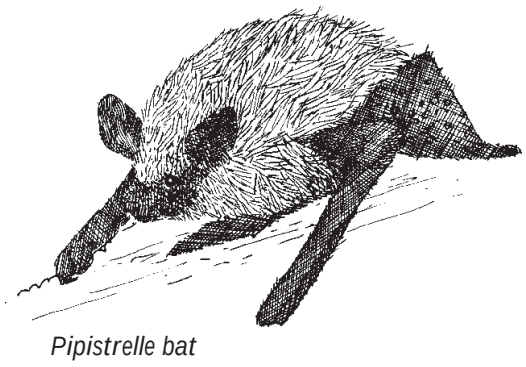
In the meantime, there are battles to be fought. Because of questions over the data in the Synergics proposal, ANS has joined others in asking for status as an "intervenor" when the Public Service Commission (PSC) hears Synergics' request for a permit. Such status will hopefully press the case for careful studies and good design decisions—decisions already spelled out in siting documents of the American Bird Conservancy, for example—setting a precedent of caution to make sure bird impacts are considered when siting decisions are made. Although at press time Synergics has not yet formally responded to our request for status, they have moved to block other individuals from weighing in when the PSC meets on October 7 to discuss the requests.


Hoary bat

Policy, hopefully, will be on our side. Letters from FWS to Synergics have indicated concern for protection of species on the site, and these letters are included in their environmental assessments. In addition, the FWS' own guidelines for siting wind facilities call for looking at each individual wind proposal as unique—i.e., don't apply data from one site to another. A detailed and rigorous protocol has already been developed that can be used in assessing site suitability—and may even offer the long range benefit of keeping the company from making costly mistakes by endangering legally-protected species. Post-construction as well as pre-construction monitoring is also recommended when companies build wind facilities on unstudied areas like ridgetops.

These guidelines are echoed in ABC's policy as well—along with specific measures like lighting and support structure recommendations that significantly reduce the impacts to birds. Key, it seems, is getting companies to commit on paper.

We can no longer afford to pretend that our energy needs will be met by "business as usual." All of our energy choices—whether it's the habitat destroying, global warming, rain-acidifying and toxin-releasing effects of coal, the collision potential from wind, the false security of embracing conservation without changing lifestyle choices, or the waste disposal and bird collision implications of nuclear—all have implications for birds, wildlife and humans, as ABC reminds us. Whether we choose to minimize these impacts is now up to us.


Pipistrelle bat