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## Wind deadline

### ■ Time is running out for bats as new tax credit promotes the expansion of turbine projects

By **Jim Balow**  
Staff writer

A rush to erect more electricity-generating wind turbines by the end of 2005 puts the wind energy industry squarely at odds with recent bat research, wildlife scientists say. Those studies show wind turbines on forested ridgetops are killing large numbers of bats.

The wind power industry got a shot in the arm in early October when Congress passed a tax bill that renewed a lucrative tax credit for wind energy projects. To qualify, developers must get their projects up and running by the end of next year.

However, six weeks of research this summer at the Mountaineer Wind Energy Center in Tucker County confirmed the 44 wind turbines there kill thousands of bats each year — as many as 4,000 a year, by one estimate.

Preliminary results of that research presented at a National Wind Coordinating Committee workshop near Washington showed that scientists know turbines are killing bats on forested eastern ridgetops. They just don't know why it's happening.

"We probably have more questions than answers," said Al Manville, a wildlife biologist with the U.S. Fish and Wildlife Service Migratory Bird Management Section national office. Manville, who helped develop a set of voluntary guidelines in 2003 to help companies find good sites for wind projects, attended the recent workshop.

"You've got the tax credit issue that's in conflict with our guidelines," Manville said. "If you're going to build new projects, you should do pre-construction monitoring. The problem is the project deadline is December 2005. It doesn't allow for good science.

"Before, the assumption was migrating bats were at risk in late summer, early fall. Now we're seeing bats that are foraging and feeding that are at risk, and bats striking blades not moving or barely moving and striking the nacelle or tower. It begs the question of what's going on here."

Wind energy developers may increase the risk to bats by creating open corridors on ridgetops when they cut down trees and build roads for their towers, Manville said. This creates easy access to insects and, in turn, may attract bats to the open area beside spinning turbine blades.

#### New bat science

Last summer, scientists at the Mountaineer site on Backbone Mountain in Tucker County simply counted dead birds and bats lying beneath the towers. They found few birds but were stunned to find 475 dead bats.

Allowing for carcasses carried off by predators and those missed by search teams, they estimated nearly 2,100 bats were killed. One bat scientist who critiqued that study said the real figure might be as high as 4,000.

This winter, site owner FPL Energy helped create a team of scientists and industry representatives called the Bat and Wind Energy Cooperative, with the goals of finding out why wind turbines are killing bats and developing solutions. The group raised funds and returned to Backbone Mountain this summer.

Ed Arnett of Bat Conservation International in Austin, Texas, served as project coordinator. He assembled scientists from across the country who met at the site from Aug. 1 to Sept. 11. Among them:

- Jessica Kerns, a University of Maryland biologist. She led a team that searched for dead bats on the ground as she did in 2003.
- Jason Horn, who's finishing work on his Ph.D. at Boston University in ecology/biology. He brought thermal-imaging video cameras to observe the interaction between bats and spinning turbine blades.
- Brian Cooper, senior scientist at ABR Inc. in Portland, Ore., who used radar equipment for a few nights to try to

correlate numbers of flying bats with dead bats the following morning.

Though their final report on the research is not due until early next year, they presented some initial findings at a National Wind Coordinating Committee workshop earlier this month.

Kerns said in six weeks, searchers found 466 bats on the ground. That's almost as many as her team found last year in more than five months. Like last year, scientists will apply a formula that accounts for predators and missed bats to estimate the total bat kill.

While some hint that number will equal or top the 2,100 figure from 2003, Kerns isn't ready to make any predictions. "I don't have a clue what the estimate will be," she said recently.

The formula this year will be more complex than the widely criticized simple one used in 2003, she said. It will take into account easily searched

areas, like the road, and rough terrain where searcher-efficiency tests showed searchers missed up to nine out of 10 bats.

"Wally Erickson [another scientist] did something about the timing" of bat kills, Kerns said. "He pulled together some of the weather data, readings every 10 minutes. A really raw analysis shows that with high wind there were very few [dead] bats the next day. Low wind was when we found the most bats."

There also seemed to be more kills around storm fronts, she said. "Most of that is anecdotal, but it does seem we see higher numbers when storms go through — sometimes before, sometimes after, sometimes during."

Further study of dead bats and how they died

Kerns' task for the next few months is to study each dead bat — correlate all the data collected, such as estimated time of death, place found, weather conditions and other data such as radar and thermal images. "It's a huge, huge data set. There's so much to incorporate into the model."

The idea is to try to detect patterns, figure out why bats are being killed and suggest ways to fix the problem. She also has to help write the final report, along with others.

Horn, whose doctoral thesis at B.U. is on the behavioral ecology of bats, spent nearly five weeks aiming thermal imaging (infrared) video cameras at the wind turbines. Unlike regular cameras that record light, his detect and record heat.

"The basic question was to try to understand why and how and under what circumstances bats are colliding with wind turbines," he said.

Before this summer, no one had really studied that. "Until now, it's only an inference that bats are struck by rotors.

"In general, what we're finding is a good amount of bat activity around the turbines at night. This is very preliminary. Bats appear at times to either investigate the rotor blades or avoid the rotor blades or are struck by the rotor blades. But it's important to attach a caveat: It's hard to interpret the images.

"Also, as a very preliminary finding we find most of the activity is happening very early in the evening — two or three hours after sunset."

Radar images fill

45 portable hard drives

Like Kerns, Horn has plenty of data to analyze. He filled 45 portable hard drives with images, each with 250 gigabytes of data.

Brian Cooper spent five nights on Backbone Mountain after conducting radar studies at wind power sites in Pennsylvania.

"We tried to get some pilot information on bat movement rates: Is there a relationship in the number of bats flying and the number of fatalities found the next morning," he said. "With five days of study, you're not going to answer the question.

"The purpose this year was to work out some of the kinks and see if you can even use radar up there. It was basically an exploration and we found it can be used. It needs to be revisited next year.

"The three nights we had [two nights were rained out], the higher night we had a higher kill, but you can't really tell anything from that," Cooper said.

Ed Arnett, the project coordinator, said he hopes to have the final report by the end of January. "That's our target date. We've got a pretty rigorous peer review process. It will be available to the general public after that. We'll put it on our Web site."

Arnett emphasized he doesn't expect to have all the answers. "One thing I said at the conference is we have not found a magic bullet yet. We have a very short, intense study. We have lots of interesting findings.

"We're going to propose returning to Mountaineer and Meyersdale [Pa.] in 2005. What we're actually going to do hasn't been decided. What I need is the final analysis of this year's data."

One missing element: an experiment to see what happens if wind turbines are shut down. Arnett said they hoped to do that study this summer but the request was made too late, and FPL Energy would not agree to shut down its turbines.

What do the results

of the experiment mean?

If scientists who conducted the research this summer are careful not to speculate, others are glad to talk about the broader picture.

Tom Kunz, a biology professor at Boston University and director of the school's Center for Ecology and Conservation Biology, is a member of the Bat and Wind Energy Cooperative's scientific advisory committee. He, like Horn, studies bats with thermal cameras.

"Wind power is here to stay," he said. "There are many good things about it. At least it's not kicking carbon dioxide into the air. It's a double-edged sword.

"I'm basically on the fence. I'm trying to find the truth, document what's going on, mitigate the effects on the environment and prevent wind turbines from being built on certain sites.

"The biggest problem is these turbines are going up like wildfire in that region, without environmental impact. That doesn't speak well for industry.

"The other thing is no one wants to pay for this research. Thermal imaging has to be done at night. Radar is even more expensive. It's not just me but a whole collection of people who want to learn about bat-turbine interaction. There's just very little money out there, either from industry or government."

'In less than a year'

industry does bat kill study

Steve Stengel, spokesman for FPL Energy, said industry reacted swiftly once it learned there were problems with bats in West Virginia. "We immediately reported that. We went to the experts. ... We formed this cooperative effort.

"In less than a year we put money together and did some of the most robust research ever in bat-wind turbine interaction. The industry has been very proactive in trying to deal with it," he said.

"Clearly it appears there is something going on at this site we need to understand better."

Stengel was asked if his company, a subsidiary of Florida Power & Light, would fund additional research at Mountaineer. He replied, "We don't know what the results are."

"Have we made a specific dollar commitment? We made a three-year commitment to the Bat and Wind Energy Cooperative. We all put in funding for a three-year period."

Tom Gray, spokesman for the American Wind Energy Association, said his group rarely takes formal positions on issues, such as whether to build in sensitive areas.

"We try to limit our role to providing companies with information on what's going on. We try to help the funding of the research."

"We would certainly talk with them [member companies] but it's a private decision whether to go forward."

"We've just begun work on a toolbox for developers. One section is on sound for turbines. We won't say to companies 'Don't put turbines a certain distance from houses.' It's a complex issue. We're providing a fairly detailed paper, a way for them to get up to speed on the issues. They take it from there. I think we'll do the same thing for bats."

#### Voluntary siting guidelines not always followed

The AWEA did take a stance on the Interior Department's voluntary siting guidelines, however, Gray said. "We definitely have some concerns about it. It was hastily put together and with very little industry input. We did file some detailed comments in December."

Manville, the Fish & Wildlife biologist, said some companies, particularly in the West, have been very cooperative in following the guidelines. "Some companies have been resistant and downright refused to use them."

"I think the issue in the East is we have a lot of small companies, kind of mom and pop, that come in and see an opportunity — a bonanza — and jump in with both feet but don't even consult with us. Then they run to us at the 11th hour. A lot of it is public education and outreach."

Mom and pop companies may start the development process, but it usually takes a large company with deep pockets like FPL Energy to actually build a multimillion-dollar wind farm. That's what happened at Mountaineer, for example.

FPL Energy promotes itself as the country's largest provider of wind energy, with 42 wind farms in 15 states. Its 2,700 megawatts of wind power make up 40 percent of the U.S. output, the company's Web site says.

Spokesman Stengel said the company has 240 MW of wind projects under construction in Texas, Oklahoma and California and hopes to add 250 to 750 MW by the end of 2005. He declined to say where.

"I work with them [FPL] a lot," Manville said. "They've come on board. We have their attention. They saw the writing on the wall at Backbone Mountain. They may have needed some prodding."

In the East, "The good wind spots are the forested ridges. Based on the big bat kill at Mountaineer, it's a red flag," he said. "You try to address it."

Manville pointed to a statement by a moderator at the recent NWCC workshop in Lansdowne.

"He said the industry is perceiving itself as green. There is a responsibility that goes with that — doing the right thing for birds and bats. With the decline of species, we have to be very, very careful in putting plants in forested ridgetop areas."

"Fish & Wildlife concurs. That's why we encourage doing preconstruction assessments, to make sure bat and bird impacts are minimized.

"I sure hope they [industry] get the message. It certainly looked like they did at this meeting a few weeks ago."

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