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# Investigating a turbine tragedy

## Bat deaths could threaten green image of wind power

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Bats and ridgetop wind turbines are a deadly combination, recent research at a Tucker County wind power site confirms.

A second round of research this summer at the Mountaineer Wind Energy Center near Thomas shows that the 44 wind turbines there killed at least as many bats as scientists found last year, said Merlin Tuttle, director of Bat Conservation International in Austin, Texas.

The 2003 study, aimed as much at birds as bats, unexpectedly found that the Mountaineer wind turbines on Backbone Mountain killed an estimated 2,092 bats.

Tuttle, not involved in that study, called the 2003 bat kill "by far the largest bat mortality event I know of worldwide and, as far as I know, the biggest mortality event of any animal." The 2004 bat kill could be even worse.

Stunned by the 2003 findings, the wind energy industry joined hands with Tuttle's group and other scientists to conduct more comprehensive research for six weeks this summer, from Aug. 1. to Sept. 11. Although they don't expect to finish analyzing all the data they collected until year's end, Tuttle and chief researcher Ed Arnett recently posted some preliminary findings on their Web site, www.batcon.org/wind/.

Tuttle is reluctant to discuss the research at length these days. He and others plan to present their findings to the National Wind Coordinating Committee in Washington, D.C.

But he and Jessica Kerns, a biologist at the University of Maryland's Center for Environmental Science in Frostburg, shared some thoughts a few days ago with the Sunday Gazette-Mail.

As she did last year, Kerns led a team who looked for dead bats beneath the wind towers. Researchers also looked for bat carcasses this year at a smaller wind farm in Meyersdale, Pa.

Both sites are owned by FPL Energy, sister of Florida Power & Light Co. The company would not let a reporter and photographer on the Tucker County site during the study this summer, citing safety and other concerns.

Tuttle and Kerns declined to say exactly how many dead bats were found this year. "It's safe to say the mortality was no less and was probably higher than last year," Tuttle said.

"It was at least as high and it occurred at two locations and they are both forested ridgetops. We don't know any forested ridgetops with turbines in North America where we don't have a problem."

These findings suggest that any wind farm built on a forested ridgetop, such as two Grant County projects already approved by the state Public Service Commission, would be likely to kill large numbers of bats.

Those projects — Mount Storm Wind Force's 166 towers and up to 200 towers by NedPower LLC — have been on the back burner since the end of 2003 after Congress failed to renew the lucrative tax credits that make wind power economically feasible.

The findings take on new urgency, though, because both the House and Senate approved a bill on Sept. 23 to extend the credits through Dec. 31, 2005. The bill is waiting for the signature of President Bush.

"If I were an investor and wanted to keep my green image intact, I would be deeply concerned about building turbines on forested ridgetops," Tuttle said.

“The bottom-line concern is, there’s just no question if we keep putting turbines on ridgetops before the solutions are known, there will continue to be bat kills.

“We hope the data we collected will lead us to possible solutions. We appreciate the cooperation from industry. I think we’ll have to do even greater research next year.”

**Researchers use thermal imaging, ultrasound**

In addition to simply counting dead bats this year, scientists brought an array of high-tech equipment to try to analyze why bats are flying into the giant windmills, whose blades reach up to 300 feet off the ground.

“We brought night imaging scopes, thermal imaging with infrared light and bat detectors. They detect the ultrasound of bats,” Tuttle said. “We used a powerful light to spot bats. We used radar for the first time at various altitudes. This is also the first time trained retriever dogs were used to see how effective we were in finding [dead] bats.”

The research was not inexpensive. “I think we spent $80,000 just to rent three thermal imaging devices.” The turbines are so large researchers needed three thermal scopes to cover one turbine, he said.

An alliance of wind companies, including many of those that helped build the Mountaineer site, chipped in to fund the research.

Kerns and her team checked for dead bats every day this year; last year they searched once a week. “We started at sunrise,” she said. “From Sunday to Friday we did half the turbines. On Saturdays we did all the turbines.

“It’s very interesting. By being on the mountain every day, you could see how weather patterns interacted, how fast the blades were turning. It’s too early to see how the weather correlated with the bat kills. “On some mornings when the blades weren’t turning, we had higher numbers. You stand underneath and say ‘Huh. Why now?’ Maybe there were more insects.”

To come up with an accurate estimate of dead bats, Kerns will develop a formula that accounts for bats her team couldn’t find and those carried off by scavengers like crows and ravens. “We saw crows carrying off carcasses,” she said.

“There are areas up there it’s just impossible — ravines impossible to climb into, grass that grows up to breast height. So some areas you just couldn’t search.”

Tuttle, Arnett and others are trying to compare the 750 gigabytes of data and other observations collected each night with the morning counts of dead bats.

“For the first time we’ll be able to correlate accurately with weather events and insect activity,” Tuttle said. “This is the first time we were able to see bats strike the blades.”

They’ve already reached a few conclusions. “We have identified key areas to focus on and are guardedly optimistic on finding solutions,” he said.

“It appears at this point the largest kills may be quite predictable. There may be options that could be taken for short periods of time that might make a difference.”

Peaks in bat kills seem to occur on calm, low-wind nights after the passage of storm fronts, for example.

On the other hand, “We find no evidence that bats are killed by stationary turbines,” he said. In other words, it’s the spinning blades.

“We also have not given up on deterrents on adjusting the sounds put off by turbines,” Tuttle said. “We have just started looking at the thermal imaging tapes. The turbines put off a wide range of sounds that are audible and ultrasonic.”

**Industry’s image, support base at risk**

The wind energy industry is highly dependent on its clean, green image because wind-generated electricity costs more than other sources. People are willing to pay extra for wind power with the knowledge that it is a renewable, nonpolluting form of energy.

Some environmentalists argue that wind turbines are ugly, especially when built in sensitive areas. Others worry about hazards to birds, although the industry argues far more birds are killed in other ways.

Wildlife and industry people have learned only recently about the problems wind turbines pose to bats.

“It was definitely a surprise to us,” said Tom Gray, deputy director of the American Wind Energy Association, the industry’s main trade group. “It was upsetting.”

The AWEA helped fund the research this summer and has gathered pledges from its members for three more years of research, Gray said. “We’re going to do a lot more research next year and try to determine how to minimize the impacts.”

Gray said this year’s study is the most thorough research of bat-wind turbine interaction ever done. “This is the first cut. Out of this will come a lot of hypotheses. Maybe insects were being attracted because of certain weather conditions. Maybe there are certain sound factors.

**‘We’ll just have to do more research’**

“What we found this year just confirms what we know. We’ll just have to do more research to determine what we have to do about it.”

Officials with the two pending West Virginia wind projects — NedPower and Mount Storm Wind Force — did not return calls from the Sunday Gazette-Mail.

Gray said project developers may be too busy dusting off blueprints now that extension of the federal tax credits seems imminent. To qualify for the credits, developers must have their turbines up and “spinning” by the end of next year.

“It’s very good news for the industry,” he said. “There’s a pent-up frustration in the industry, a lot of projects in the pipeline.

“We had to raise money for this research without a lot of revenue coming in. It’s impacted us in a number of ways. There were a lot of layoffs.”

Project developers are well aware of the bat research and the preliminary findings, Gray said. He said Tuttle and Arnett discussed them with developers in a conference call several days ago.

“Those are permitted projects,” he said of the two in West Virginia. “Companies are probably going forward with them. Those are decisions to be made by them [the developers].

“In terms of the long-term future of ridgeline turbines, I think it’s too early to say. We need more research.... In terms of the green image, certainly there are those who can make that point.

“Our demand for electricity is growing. You have to get it from somewhere.” Other energy sources have more environmental drawbacks than wind, he argued. “We do take this seriously,” he added.

Tuttle said he’s not an opponent of wind energy. “In fact, I love those big turbines. I’m fascinated, standing under them. But I’m concerned.

“When it comes to the broad public, people who love green power also love wildlife, and I think that applies to bats.” Public support of wind energy could wane unless solutions are found, he said.

“I think they [people in the wind energy industry] should be concerned for their own support base,” Tuttle said.

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