

New whistle alerts bats to steer clear of wind turbines

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Wind turbines are a critical component in the strategy for energy independence, but these massive structures are also killing bats. The U.S. Geological Survey estimates that the more than 52,000 wind turbines operating in the United States kill tens of thousands to hundreds of thousands of bats in North America annually.

Now, researchers from Texas A&M University in College Station are exploring a unique passive acoustic whistle mounted on [turbine blades](#) to warn bats of the deadly turbines using a sound they can easily hear and recognize.

Wind turbines are lethal to bats in two ways: blunt force trauma or the pressure difference produced by the rotating blades causing the bat's small lungs to explode.

Previous attempts to warn bats of danger focused on using electrical acoustic devices to broadcast broadband noise. The loudspeaker was placed at the center of the [turbine](#), but the noise it emitted was typically too quiet to project far enough outward to encompass the 38-meter blades, which limited their effectiveness. In addition, previous devices required a [power source](#) and the components were unable to withstand normal environmental conditions.

"Our approach focuses on producing a sound bats could easily recognize and locate, thereby making it easier for them to avoid the moving turbine blades," said Michael Smotherman of Texas A&M who will present the

team's research findings at the 177th Meeting of the Acoustical Society of America. "I'm hopeful that using this neuroethological approach to the design and implementation gives us a better chance for success."

Smotherman and his colleagues from the University of Massachusetts Amherst leveraged bat's natural echolocation to develop a biomimetic whistle that could be mounted on turbine blades to signal danger. The whistle was modeled from a bat's larynx, which can produce multiharmonic tones detectable by bats at distances of up to 100 meters.

The team tested whether bats detect and respond to the sounds produced by the whistles by presenting recordings in the lab to flying bats. They also played [whistle](#) recordings in the field to evaluate if [bats](#) changed their flight trajectories in response to the warnings.

"If the sounds are effective at realistic [volumes], then we will proceed to testing on full-sized [wind turbines](#)," Smotherman said.

The whistles can be 3-D-printed using durable synthetic material. Smotherman hopes to make these whistles available to commercial [wind](#) farm operators, but acknowledges that the installation will be very expensive.

"We still have some work to do," he said.

More information: Presentation #3aABa5, "Developing a biomimetic acoustic deterrent to reduce bat mortalities at wind turbines," will be at 9:25 a.m., Wednesday, May 15, in the Clements room of the Galt House in Louisville, Kentucky. acousticalsociety.org/asa-meetings/

Provided by Acoustical Society of America

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