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New Research Helps Predict Bat Presence at Wind Energy Facilities



ALBANY, Calif.—An interactive tool developed by researchers from the USDA Forest Service’s Pacific Southwest Research Station (PSW) will help wind energy facility operators make informed decisions on efficient ways to reduce impacts on migratory bats.

Fatalities of migratory bats at wind energy facilities have become a frequent occurrence. Bat migration patterns are poorly understood and the relationship between fatalities at wind energy facilities and migratory behavior are still being studied. Previous research has shown that adjusting the operations of turbines can reduce the number of bats killed at wind energy facilities. However, this strategy has not yet been widely implemented.

Current research found that bat activity depends on time of year and a number of environmental conditions, such as wind direction and speed, air temperature, and moon phase. This suggests that there may be ways to improve the effectiveness and efficiency of mitigation measures. PSW ecologist Ted Weller and statistician Jim Baldwin developed an interactive tool that allows users to visualize how changes in date and weather conditions affect the probability of bat presence. The tool can be found at: <http://www.fs.fed.us/psw/topics/wildlife/bat/batprob.shtml>

“Increasing the wind speed at which turbines begin to spin and produce energy to the grid has proven to be an effective way to reduce bat fatalities. However, bat activity levels depend on more than just wind speed,” says Weller, who led the research. “Our work demonstrates the use of a decision-making tool that could protect bats when fatality risk is highest while maximizing energy production on nights with a low chance of fatalities.”

Weller and his research team used devices which detected the bats’ echolocation calls, then linked the presence of bats to the weather conditions measured on-site on a given night. Researchers found that echolocation detectors placed at 22 meters and 52 meters above ground were more effective at characterizing migratory bat activity than those located closer to the ground. Moreover, multiple echolocation detectors were required to accurately characterize bat activity at the facility. They then built models to predict the presence of bats based on date and weather variables.

“Properly deployed echolocation monitoring can be an effective way to predict bat activity and, presumably, fatalities at wind energy facilities,” says Weller. “These days, pre-construction echolocation monitoring is as common as meteorological monitoring at wind energy facilities, so the basic building blocks for these models are available at most proposed sites.”

Researchers conducted the study at a wind energy facility in the San Geronio Pass Wind Resource Area near Palm Springs, Calif. The study was a collaborative effort between government, industry, and a non-governmental organization to devise effective solutions to 21st century environmental issues. Cooperators included PSW, Iberdrola Renewables, and the Bats and Wind Energy Cooperative, with primary funding provided by the California Energy Commission Public Interest Energy Research program.

Findings from this study appear online in the Journal of Wildlife Management. Read the full article at: <http://treearch.fs.fed.us/pubs/39603>

Headquartered in Albany, Calif., the Pacific Southwest Research Station develops and communicates science needed to sustain forest ecosystems and other benefits to society. It has laboratories and research centers in California, Hawaii and the U.S.-affiliated Pacific Islands. For more information, visit www.fs.fed.us/psw/.

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