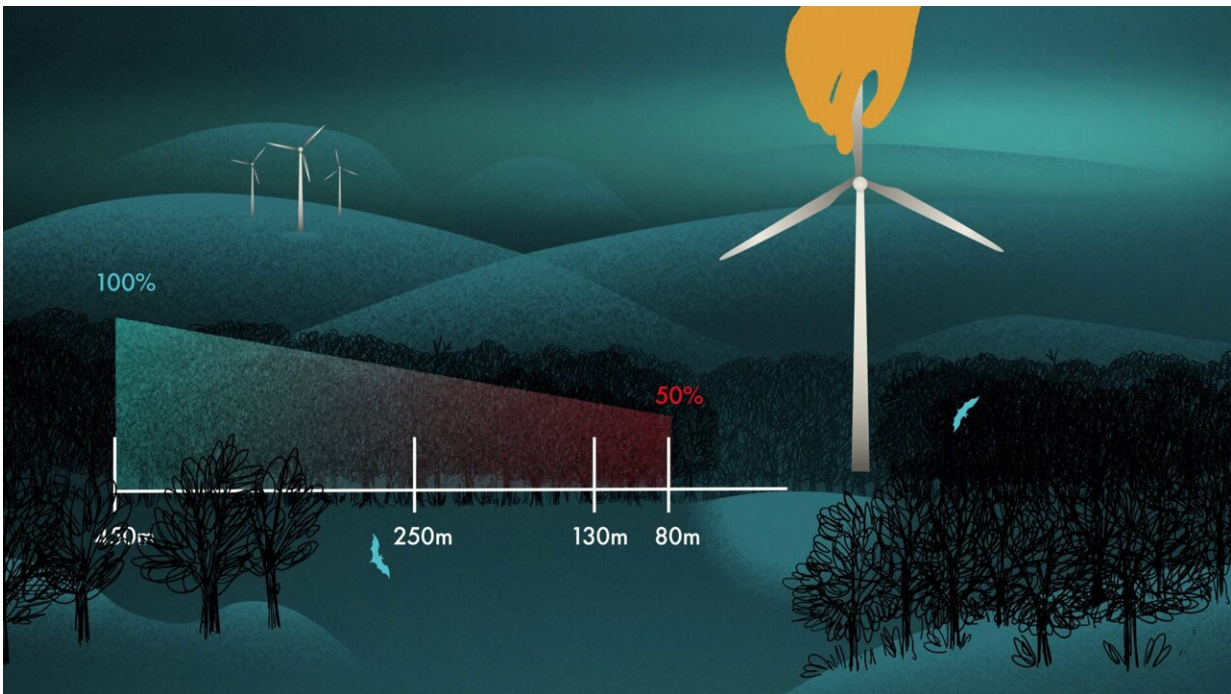


# Ultrasonic detectors reveal the detrimental effect of wind turbines on bats

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Bats at wind turbines. Credit: Leibniz-IZW

As more and more wind turbines (WTs) are installed in the course of the energy transition and distance regulations to human settlements are tightened, suitable locations are becoming increasingly difficult to find. As a result, wind turbines are increasingly being erected in forests—to the detriment of forest specialists among bats. In a new study, a team of scientists led by the Leibniz Institute for Zoo and Wildlife Research

(Leibniz-IZW) demonstrated that forest specialists among bats, which forage below the treetop and thus do not have an increased risk of colliding with turbines, avoid the vicinity of wind turbines. Forest sites should therefore either not be used at all for wind turbines, or only in exceptional cases with mandated compensatory measures to protect forest bats, the team concludes in a paper now published in the *Journal of Applied Ecology*.

More and more [wind turbines](#) are being installed worldwide in order to meet the goals of national climate strategies. In Germany, around 30,000 onshore [wind](#) turbines are currently in operation. However, the open areas on which wind turbines are tolerated near towns and villages are limited. For this reason wind turbines are increasingly being erected in forests. "Forests are sensitive ecosystems and valuable habitats for many rare and protected [bat species](#)," says Dr. Christian Voigt, Head of the Department of Evolutionary Ecology at Leibniz-IZW.

"Wind turbines in forests can cause problems for [bats](#) in several ways. Bats that hunt for insects above the treetops can be killed directly at the turbines if they collide with the [rotor blades](#) or do not survive the intense air pressure differences near the blades. Bats that hunt in the vegetation below the treetops lose part of their habitat because of the creation of clearings." Their habitat could also deteriorate in the wider vicinity of wind turbines and clearings if they are disturbed by the operation of the turbines.

Together with colleagues from Phillips-Universität Marburg and Kiel University, Voigt and his student primarily looked at those bats that forage below the treetop in the shelter of the vegetation. To do this, they monitored the activity of bats using ultrasound detectors at different distances from the wind turbines at 24 [forest](#) sites in Hessen. The scientists classified the recorded calls into three groups of bats. Firstly, those that forage in open areas (e.g. above the treetops), secondly, the

species that hunt at edge structures, and thirdly, the specialists for foraging in narrow spaces, for example forest specialists below the canopy such as the bats of the genera mouse-eared bats (*Myotis*) or long-eared bats (*Plecotus*).

"These forest specialists were significantly less active close to wind turbines, especially near turbines with large rotors, and during midsummer months," says Voigt. Starting from a distance of 450 meters towards wind turbines, the activity of these bats dropped by almost 50 percent close to the turbines.

Wind turbines at forest sites thus not only pose a direct threat to those bats that hunt for insects above the treetops but also deteriorate the habitat for bats that live below the treetops in the forests and hunt for insects there. "Even though forest specialists are not at risk of colliding with turbines, they are nonetheless suffering from wind turbines in forests due to [habitat loss](#) as they avoid operating wind turbines over a distance of several hundred meters," concludes Voigt.

The authors therefore recommend that wind turbines should not be sited inside forests but in the open landscape and in particular, that near-natural forests with a varied vegetation structure should be avoided. If wind turbines nevertheless have to be erected in forests, compensatory measures are essential. A pivotal component of these mandated compensatory measures should be to set aside an appropriately large area of forest as a wilderness area for forest specialist bats, so that the loss of habitat caused by the operation of the turbines is compensated for.

**More information:** Julia S. Ellerbrok et al, Activity of forest specialist bats decreases towards wind turbines at forest sites, *Journal of Applied Ecology* (2022). [DOI: 10.1111/1365-2664.14249](https://doi.org/10.1111/1365-2664.14249)

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