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SMALL TURBINE COLUMN:

BATS AND WIND TURBINES

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Last month's Small Turbine Column in the *Windletter* examined both the perceived and real problems that wind turbines pose to bird populations (see <http://www.awea.org/faq/sagrillo/swbirds.html>). There is, however, another group of animals that, like birds, might be impacted by wind turbines: bats.

Creatures of the night, bats occupy the same ecological niche as birds do, only twelve hours later. While birds forage for insects, fruits, and seeds during the day, North American bats are sound asleep. Bats come awake for the night shift, when the birds are no longer out and about.

Bat populations are endangered by human activities in general. Disturbing or awakening hibernating bats disrupts their metabolism, often leading to starvation over winter. Pesticides in the insects that bats prey upon can accumulate in the fats that bats depend upon for over-wintering or migration, resulting in massive bat die-offs. Finally, loss of habitat threatens bats similarly to the way that bird species are endangered.

But do wind turbines in particular threaten bats? The interaction of bats with wind turbines is, like many other behaviors that bats exhibit, not well understood. While there have been numerous studies centered around birds and wind turbines, relative few of these studies have included bats. The ones that have been done, however, suggest that wind turbines do not pose a significant threat to bat populations.

One of these studies, "Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting, and Mortality Information from Proposed and Existing Wind Developments," by WEST, Inc., released December, 2002, concludes that "bat collision mortality during the breeding season is virtually non-existent, despite the fact that relatively large numbers of bat species have been documented in close proximity to wind plants. These data suggest that wind plants do not currently impact resident breeding populations where they have been studied in the U.S."

The study goes on to say that "All available evidence indicates that most of the bat mortality at U.S. wind plants involves migrant or dispersing bats in the late summer and fall." It is theorized that migrant bats, since they are not searching for insects or feeding, turn off their echolocation in order to conserve their energy resources.

Results from studies done at Buffalo Ridge ("Interim Report: Bat Interactions with Wind Turbines at the Buffalo Ridge, Minnesota, Wind Resource Area: 2001 Field Season") and at the Kewaunee County (Wisconsin) Wind Farms (Effects of Wind Turbines on Birds and Bats in Northeast

Wisconsin" by Dr. Robert Howe, et al, November, 2002) agree with the "Synthesis and Comparison" findings.

For example, the Minnesota Interim Report comes to the following conclusions:

- The wind plant probably does not impact bat breeding populations in the project area;
- All available evidence indicates that most of the mortality involves migrant or dispersing bats in the fall; and
- Preliminary data indicate that the population of bats susceptible to turbine collisions is large enough that the observed mortality is not sufficient to cause population declines.

The Buffalo Ridge study concludes by putting a number on the bat mortality at from 2.45 to 3.21 bat fatalities per turbine, depending on location of the wind farm. The Kewaunee County report came up with similar results. Over the two-year span of that study, researchers documented 1.16 bat fatalities per turbine per year. Adjusting for possible sampling error could bring this number as high as 4.26 bat fatalities per turbine per year. Like the other studies, the Kewaunee County study found that the bulk of those killed by the wind turbines, over 90%, were migrating bats, not resident breeding populations.

We do know that many bats, like birds, die due to collisions with "lighthouses, communications towers, tall buildings, power lines, and fences" (Buffalo Ridge report). But, as with birds, the number of fatalities due to wind turbines is extremely low compared to collisions with other man-made structures.

Finally, no reports have been registered about bat fatalities resulting from their living and foraging for insects in the neighborhood of a home-sized wind turbine. One can only conclude that, as with birds, home-sized turbines pose no significant threat to the night shift: bats.

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[Editor's Note: The opinions expressed in this column belong solely to the author.]