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Protect Our Bats

By RODRIGO A. MEDELLÍN, DON J. MELNICK and MARY C. PEARL MAY 11, 2014

DISEASE and heedless management of wind turbines are killing North America's bats, with potentially devastating consequences for agriculture and human health.

We have yet to find a cure for the disease known as white-nose syndrome, which has decimated populations of hibernating, cave-dwelling bats in the Northeast. But we can reduce the turbine threat significantly without dismantling them or shutting them down.

White-nose syndrome (also known as W.N.S.) was first documented in February 2006 in upstate New York, where it may have been carried from Europe to a bat cave on an explorer's hiking boot. In Europe, bats appear to be immune, likely the outcome of a long evolutionary process. But in North America, bats are highly susceptible to the cold-loving fungus that appears in winter on the muzzle and other body parts during hibernation, irritating them awake at a time when there is no food. They end up burning precious stores of energy and starve to death.

The consequences have been catastrophic. A 2011 study of 42 sites across five Eastern states found that after 2006 the populations of tri-colored and Indiana bats declined by more than 70 percent, and little brown bats by more than 90 percent. The population of the northern long-eared bat, once common, has declined by an estimated 99 percent and prompted a proposal from the United States Fish and Wildlife Service to list it as an endangered species. Other species of hibernating cave-dwelling bats have declined precipitously as well.

Whether these bats will recover or go extinct is unclear. Meanwhile, W.N.S. continues to spread rapidly. On the back of this year's extremely cold winter, it moved into Michigan and Wisconsin. It is now confirmed in 23 states and five Canadian provinces.

Tree-dwelling bats don't seem to be affected by W.N.S., since they don't hibernate in caves. But wind farms are killing them.

Wind turbines nationwide are estimated to kill between 600,000 and 900,000 bats a year, according to a recent study in the journal *BioScience*. About half of those lost to turbines are hoary bats, which migrate long distances seasonally throughout North America. Eastern red and silver-haired bats, commonly seen in Central Park in New York City hunting insects at night, are also being killed by turbines by the tens of thousands.

We can't afford to lose these creatures. In the Northeast, all of our native bat species eat insects. One little brown bat can eat 1,000 mosquitoes in an hour, reducing the potential for mosquito-borne diseases. A colony of 150 big brown bats can protect crops from up to 33 million rootworms over a growing season. The Mexican free-tailed bats of Bracken Cave in south-central Texas consume about 250 tons of insects every summer night. The natural pest control provided by that species across eight Texas counties has been valued at nearly \$750,000 as it protects the \$6 million summer cotton crop. Nationwide, the value of bats as pest controllers is estimated to be at least \$3.7 billion and possibly much more. (This leaves out the value of two other very important services that bats provide: controlling insect-borne diseases and pollinating commercially valuable plants.)

Today, genetic engineering may seem to provide an effective way to protect crops from insects, but pests have already developed resistance to some of these products. Insects also readily evolve resistance to chemical insecticides, and increased use of these chemicals would come at a great cost to human health. But bats have shared the night skies with insects for at least 50 million years, and they know how to hunt and eat them.

Fortunately, we can reduce the mortality caused by wind farms, which

are often located on windy routes favored by some migratory bats. Wind turbines usually switch on automatically at wind speeds of about 8 to 9 miles per hour, speeds at which insects and bats are active. But if, during times of peak bat activity, energy companies recalibrated their turbines to start at a wind speed of about 11 miles per hour, which is too windy for insects and bats to fly, turbine-related deaths could be reduced by 44 to 93 percent, according to a 2010 study published in the journal *Frontiers in Ecology and the Environment*. The effect on power output would be negligible — less than 1 percent annually.

Threats to bats also threaten us. We should step up research on the prevention and cure of white-nose syndrome. And we should require energy companies to take steps to protect bats from collisions with wind turbines. It is foolish to spend enormous sums to create pesticides and transgenic crops to fight insects, while investing little to protect bats, our most efficient insect fighters.

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