Protecting Species in Illinois' Wind Belt

DNR assesses the danger wind turbines may have on wildlife.

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If all the wind farms currently planned for Illinois are eventually built, more than 5,000 turbines could someday dot the state's landscape, dramatically changing the face of rural Illinois. Just as the wooden barn once identified rural enterprise, the slowly rotating blades of hundreds of wind turbines could represent the standard roadside image for tomorrow's interstate traveler.

What does this mean for Illinois' wildlife, particularly birds and bats? Last year, Illinois House Resolution 943 charged the Department of Natural Resources with assessing the danger of wind turbines to birds. Because no major on-the-ground study has been conducted in Illinois, DNR staff consulted the scientific literature. They concluded that the existing scientific data is not adequate to determine the potential biological significance of avian mortality from wind turbines.

Nationwide it is estimated that, on average, two birds are killed by each modern wind turbine in a year's time.

If all the planned wind turbines are built, more than 5,000 will one day tower over the Illinois landscape.

These numbers are based on studies at widely spaced projects around the country. A small post-construction mortality study at the Crescent Ridge wind project in Bureau County was consistent with these estimates. The Crescent Ridge development is fairly small, with only 33 turbines. The mortality study was conducted between August 2005 and July 2006. It estimated that 31 birds and 93 bats were killed during the period, an average of one bird and three bats per turbine. Only one dead raptor, a red-tailed hawk, was found, and no carcasses of endangered or threatened species were found.

(Photo by Joseph Prosise.)

DNR generally learns about new wind farm developments when they are submitted for consultation under the Illinois Endangered Species Protection Act. Potential impacts to state-listed birds have arisen only once so far during wind project consultations—for Henslow's sparrow and loggerhead shrike at the Bishop Hill project in Henry County.

The state-threatened Henslow's sparrow is an area-sensitive grassland species that requires large open tracts. It may be displaced or excluded from otherwise suitable habitat by vertical structures, such as wind turbines,

(Photos by Peter Weber, On Silent Wings Bird Photography, www.wildbirdphotos.com.)

Questions remain on whether wind turbines will interfere with the habitats of endangered and threatened species, such as upland sandpipers (left) and loggerhead shrikes.

and by the incursion of roads, which create habitat breaks that they will not tolerate. The loggerhead shrike, also a threatened grassland bird, requires an interspersion of grassland and trees, which often is provided by fencerows.

Shrikes can be affected by the removal of fencerows for construction or the elimination of wind turbulence. In this instance, the developer applied for Incidental Take Authorization for both species.

Because of the scant on-the-ground research available in Illinois, DNR's report to the Governor and General Assembly did not recommend any regulatory action at this time. However, it did point out the following concerns:

Migrating bats are among biologists' top concerns. Bats are at the greatest risk because two to three times as many are killed by turbines, and bats have low reproductive rates. Studies have shown that migrating bats fly close—and may actually be attracted—to rotating blades and perish close to the turbine support structure, particularly in the first part of the night. Sometimes, but not always, they show evidence of injury caused by impact.

An average of one bird and three bats were killed by each turbine during a one-year morality study in Illinois.

Daytime migrating birds can be at risk when they concentrate on a narrow migration path. The western shore of Lake Michigan funnels migrating raptorial birds into and past the Chicago area every year. The Illinois Natural History Survey has documented the migration with both visual counts and radio tracking.

Night-migrating birds that fly at the height of a turbine's revolving blades, 100-450 feet above the ground, also would be at risk. However, most birds fly higher than the maximum blade height of current wind turbines. Important exceptions include takeoff (usually at dusk), descent and landing (usually in the second half of the night), and perhaps nights with a low cloud ceiling. Few studies of bird or bat fatalities at wind turbines have been intensive enough to come to useful conclusions about the interaction of low clouds, migrating vertebrates and wind turbines. No mass kills in a single night, such as can occur at tall guyed broadcast towers, have been documented at any terrestrial wind farm in North America.

Two birds that do fly at the height of a rotating turbine are the male upland sandpiper and prairie horned lark during courtship displays. Upland sandpipers are a state-endangered species that have been reported from several counties targeted for wind development. If their territory or display grounds are near turbines, the birds could be at risk of death

or injury. The Illinois Endangered Species Protection Act prohibits the taking of listed species.

Another specific concern for biologists is LaSalle Lake, a cooling lake for a nuclear reactor that is located in an area with high potential for wind energy. The LaSalle County lake is an important wintering area for migratory waterfowl because it rarely freezes and the surrounding farm land provides food. On one November evening, INHS staff observed more than 50,000 ducks returning to the lake after foraging. While studies have been somewhat contradictory—some found that local water birds avoid feeding in areas near wind turbines, others indicate that wind turbines pose hazards for arriving or departing birds—the potential exists for large wind arrays to significantly impact foraging birds at LaSalle Lake.

On-going studies will shed light on the impacts wind turbines could have on migrating birds and bats.

Among the many unknowns of wind turbine impact on wildlife is the effect of flicker on prey species such as birds and small mammals. Flicker is the effect of sunlight passing through the rotating vanes of a wind turbine. The rapidly moving shadow that develops during certain parts of the day could mimic a bird of prey. Scientists do not have enough data to determine if a constantly repeated shadow is tolerated by prey species, elevates their levels of stress or causes them to avoid the habitat.

For the complete report, "The Possible Effects of Wind Energy on Illinois Birds and Bats" go to www.dnr.state.il.us/publications/pdf/00000544.pdf.

The Illinois Endangered Species Protection Act and the Illinois Natural Areas Preservation Act require government agencies to consult with DNR before authorizing, performing or funding any action that disturbs the land, water or air. Consultation will determine if an action is likely to modify a natural area, or adversely impact state-threatened or endangered species or their essential habitats. Consultation requests can be submitted to EcoCAT at www.dnrecocat.state.il.us/ecopublic.

DNR will continue to monitor this rapidly expanding technology and keep abreast of new information concerning the impact on wildlife. In the meantime, to better understand the impact of wind farms on Illinois birds, the state could:

- Develop a map of areas of concern to highlight protected natural resources and wildlife areas where developers should take extra precautions when developing wind farms.
- Fund a major study of bird abundance and richness before and after turbines are constructed at representative sites in the state.
- Fund a comprehensive study of bat mortality around existing wind farms.

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