# Bird and Bat Mortality Associated with the Top of Iowa Wind Farm

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Top of Iowa Wind Farm
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## Goals and Objectives:

- To measure the length of time bird-collision evidence remains available to be found by investigators during the spring, summer and fall seasons.
- To develop a detection correction factor for each investigator that searches for bird-collision evidence to correct for evidence that may be overlooked.
- Estimate bird and bat mortality resulting from impacts with wind-generator towers and turbine blades, with emphasis on mortality during the spring and fall migration periods.
- Estimate bird and bat species composition, relative abundance, habitat use, flight patterns and the relative mortality risk at turbine sites versus non-turbine sites, and also in relation to distance from the wind farm.
- To estimate differences in waterfowl use of quarter sections with and without turbines inside the area that is closed to Canada goose hunting to determine the impacts of turbines on waterfowl feeding behavior and assess the relative mortality risks to feeding waterfowl.

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**Progress:**

A thesis, filed in August, included the following in chapter abstracts. We examined bird collision mortality, activity and species composition, at an 89-tower wind resource area (WRA) in north-central Iowa, from April 15, 2003 to December 15, 2003 and March 15, 2004 to December 15, 2004. We found 2 birds in 2003 and 5 birds in 2004, in search transects and gravel access areas under towers. We adjusted for search probability, search efficiency and scavenging rate and estimated total bird mortality at 39.47 ± 4.60 (95% CI) in 2003 and 85.38 ± 7.78 (95% CI) in 2004. Bird abundance did not differ significantly between tower and non-tower sites. Bird flight close to the tower at rotor height was rare. There was a general trend, across species, of avoidance of the 0-30m zone closest to towers. These behaviors possibly reduce the risk of collision mortality.

We also examined bat collision mortality, activity and species composition at the WRA. We found 30 bats in 2003 and 45 bats in 2004. We adjusted for search probability, search efficiency and scavenging rate and estimated total bat mortality at 587.78 ± 28.95 (95% CI) in 2003 and 785.87 ± 40.00 (95% CI) in 2004. While carcasses were most often migratory species, we found many non-migratory little brown bats (*Myotis lucifugus*). We recorded 1465 bat calls at tower sites (on average, 34.88/detector-night) and 1536 bat calls at adjacent non-tower sites (on average, 36.57/detector-night). Bat activity did not differ significantly between tower and non-tower sites. Bat calls were mostly by little brown bats. There was no relationship between types of tower lights and collision mortality or activity. July and August, in the fall migratory period, had both the highest bat activity and the highest collision mortality.

We examined Canada goose (*Branta canadensis*) foraging activity and vigilance behavior at the WRA from September 15 to December 25, 2003 and from September 27 to December 22, 2004. We recorded approximately 1.2 million and 904,200 goose-use days (goose observed on a given survey) in fall 2003 and 2004, respectively, in three wetland management areas in close proximity to the WRA. The northwest section of the WRA was constructed in an area closed to Canada goose hunting. Historically, Canada geese foraged and flew over this area. We modelled the effect of the presence of a wind tower in a field on the use of that field by goose flocks but found no evidence that the towers affected goose field choices. We also estimated whether vigilance behavior differed between flocks foraging in WRA fields and non-WRA fields within the area closed to Canada goose hunting. We found no significant difference between vigilance levels ($F = 0.01$, $df = 1, 59$, $P = 0.92$) in WRA fields and non-WRA fields.

**Conclusions and Recommendations:**

The Top of Iowa WRA had minimal impact on birds in the region. Bat mortality was substantial. More research should be conducted on the behavior of bats while engaged in collision-prone flight at rotor heights. Aaftab Jain has taken a temporary position working in the Adirondack Mountains of New York.