ENVIRONMENTAL AND ECONOMIC RESEARCH AND DEVELOPMENT PROGRAM

Regional Analysis of Wind Turbine-caused Bat and Bird Fatality

Executive Summary
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Executive Summary

Wind energy has been the fastest-growing renewable energy source for electricity in the United States. Many studies have estimated avian and bat fatalities at wind turbine facilities. However, direct comparisons of the results of these studies is difficult and can be misleading due to the numerous differences in the study protocols and the methods used to develop a final estimate of fatality. We had a unique opportunity to compare the fatality estimates from 3 wind energy facilities (Blue Sky Green Field Wind Energy Center (BSGF), Cedar Ridge Wind Farm (CR), and Forward Energy Wind Center (FE) in southeastern Wisconsin. These 3 energy developments are contained within 2 neighboring counties (Dodge and Fond du Lac) in similar land use and land cover, used similar post-construction study methodologies, have turbine models that are close in size and nameplate capacity, and all became operational within 7 months of each other. Analysis of these facilities as a group provides a detailed picture of regional fatalities. Therefore, our objectives were to combine bird and bat mortality across all 3 wind energy facilities:

1) To examine bird and bat species composition relative to mortality
2) To examine temporal and spatial patterns of bird and bat mortality;
3) To investigate whether select habitat, structural, and landscape features may influence mortality.

Bird mortality was low and within the norms observed by other studies; however, bat mortality was higher than most other previous research in Midwestern agricultural lands. Similarities within the data were shared by all 3 wind projects, including greater overall bat mortality at each wind facility relative to bird mortality, temporal and spatial patterns for bird and bat mortality, and avian species composition. Data differences across the 3 wind facilities included species composition of the bat mortalities and raw and corrected number of bat carcasses recovered. Our landscape analysis suggested that the fall season was the predictor variable that best explained bat mortality.

We recommend that pre- and post-construction bat monitoring occur at individual wind facilities rather than relying on published results from other wind facilities and assumptions that wind facilities in close geographic proximity will have similar mortality rates and species composition of mortalities. We also suggest further research be conducted to better understand and be able to predict bat mortalities, especially during peak mortality times in the fall, thereby refining curtailment as a cost-effective mitigation technique when necessary.