

**Short-eared Owl Surveys for the Cross Winds Proposed Wind Energy Site:
Summary of Winter 2012 Field Season**



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Executive summary

The development of wind energy has the potential to significantly reduce the emissions of harmful air pollutants, greenhouse gases, and our reliance on fossil fuels. Avian collisions with wind turbines have been documented, but the frequency of those collisions is site and situation specific. Informed siting of wind turbines can minimize impacts to birds. Migrant Short-eared Owls use the Cross Winds Project Area during the winter months. This species is considered endangered in Michigan; therefore, it is important to determine the specific areas and habitat types they are using in the Project Area. With the support of the United States Fish and Wildlife Service and the Michigan Department of Natural Resources - Wildlife Division, we conducted winter surveys of the Michigan endangered Short-eared Owl to better understand the densities of this species. These data will help wind energy developers and resource managers to make appropriate decisions regarding the potential impacts to this species and the methods by which they might reduce those impacts.

We established observation points one-km apart given the detection challenges of this cryptic species. The exact locations were determined in part based on the best possible viewshed of the proposed Project Area. Surveys periods at each point were five-minutes in length with a conspecific broadcast for the first minute. During the survey the locations, flight paths and/or perched locations of Short-eared Owls and other observed sensitive species within 500-m radius were recorded. Each observation included the collection of the following data: survey point number, observation number, time when observed, species or best possible identification, direction and distance of the bird from the observer, number of individuals, if the observation included an auditory response, gender (if possible), the activity (behavior) based on the point of first observation (perched, gliding, soaring, hovering, flapping, auditory, hunting, other), flight height (altitude above ground when first observed within 500-m of the survey point), and habitat(s) or the vegetation type in which or over which the bird occurred based on the point of first observation within 500-m radius of the survey point (corn stubble, bean stubble, beat stubble, grass, pasture, winter wheat, bare dirt, or other). Any additional notes or clarification were also recorded for each observation if appropriate. Any additional general comments about the survey were included in the general comment

section. We conducted 5-minute surveys at the stations two times per month between mid-February and March 31 2012.

During the 222 Short-eared Owl surveys observers detected two Short-eared Owls and during the large bird surveys observers detected 15. When using the area, Short-eared Owls specifically used grassy roadside ditches and grassy fields within the matrix of dormant winter crop fields. Upon examination of the Short-eared Owl data, it appears that the flight behavior of this species did not put them at frequent risk of collisions with wind turbines. Their flight altitude was lower than the RSA of the turbines. To further decrease the risk of turbine collisions with this state endangered species I suggest avoiding grasslands when siting wind turbines.

Table of contents	Page
Introduction.....	3
Study Site and Methods	4
Study site and description	4
Short-eared Owl surveys.....	5
Results and Summary	7
Short-eared Owl Surveys – Winter 2012	7
Summary	8
Acknowledgements.....	9
Literature Cited.....	9

Introduction

The development of wind energy has the potential to significantly reduce the emissions of harmful air pollutants, greenhouse gases, and our reliance on fossil fuels. The U.S. Department of Energy has a goal of 10 GW of wind energy deployment in Michigan by the year 2030. The majority of the areas with high potential for wind energy generation are near the shorelines of the Great Lakes. These shorelines have also been documented to provide important habitat for wildlife, including migratory songbirds and raptors. Research across North America has demonstrated a relationship between the densities of birds in an area and the numbers of avian collisions. Birds that use the airspace within the rotor swept area of a turbine are at higher risk of a collision and therefore the frequency of avian collisions at turbine sites can be directly correlated to the

density of birds in the local area, which is typically site and situation specific. We collected data on the locations and behaviors of wintering Short-eared Owls in the Cross Winds Project Area. These data will help wind energy developers and resource managers to make appropriate decisions regarding the potential impacts to this species and the methods in which they might reduce those impacts.

Study Site and Methods

Study site and description

Research was conducted in the Project Area within Tuscola County, located in east-central Michigan, USA (Fig. 1). The land use / land cover of the Project Area consists mainly of agricultural fields (e.g. corn, soybeans, and sugar beets), with some pastures, small forested areas, fencerows, and some small wetlands. The natural vegetation in this area is generally described as mesic forests, and wet forests. The forest overstory typically includes components of maple (*Acer* spp.), oak (*Quercus* spp.), ash (*Fraxinus* spp.) and beech (*Fagus grandifolia*). Historically, the eastern inland portion of the Project Area was vegetated with beech-sugar maple forest mixed with black ash swamps. The western portion was predominantly mixed hardwood swamp and areas of mixed conifers with hemlock-white pine. The majority of these areas are now drained for agricultural use (Comer et al. 1995). The western edge of the Project Area is approximately 1.9 – 4.6 miles from the Lake Huron lakeshore (i.e., Saginaw Bay), which is considered by some to be a concentration area for migratory birds. Our Study Area includes the shoreline areas thereby providing a thorough survey effort.

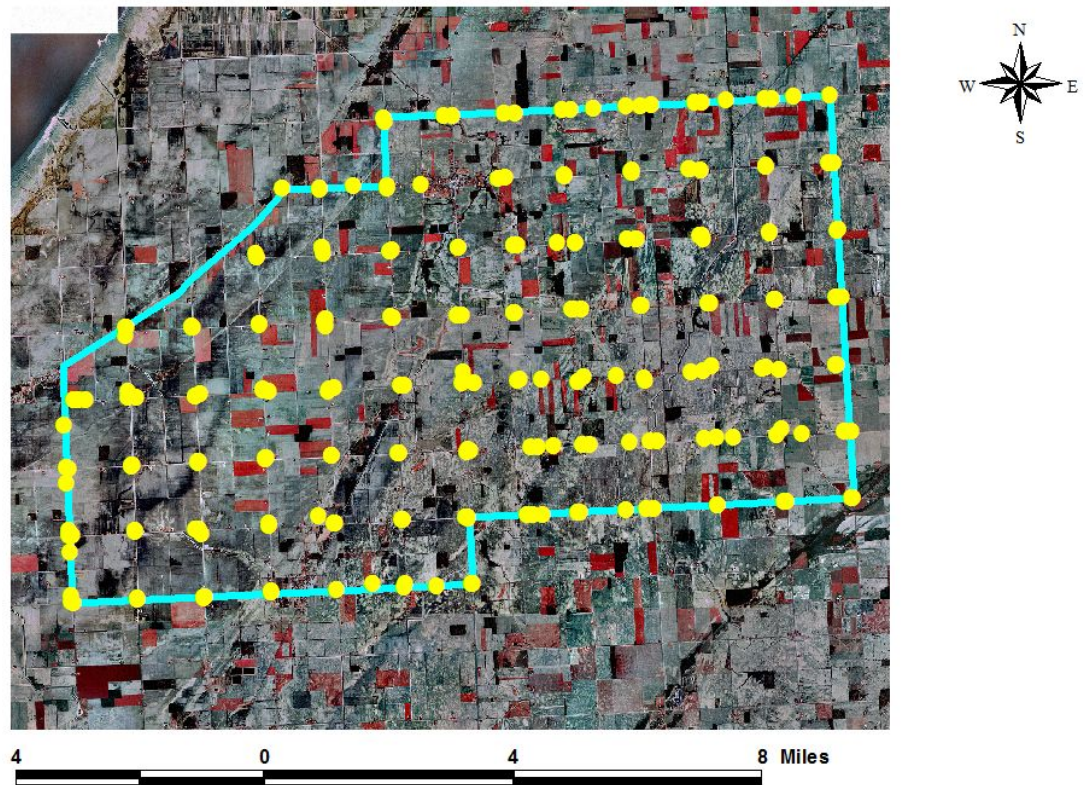


Figure 1. Short-eared Owl Survey stations (yellow dots) were established (spaced 1-km apart) in Tuscola County, MI in and around the Project Area proposed for wind energy development. The Project Area is predominantly agricultural lands with some interspersed forested areas.

Short-eared Owl surveys

We established Short-eared Owl observation stations spaced 1-km apart and completely sampling the Project Area. These stations provided the best possible viewsheds of the proposed project sites (Fig. 1). We conducted 5-minute surveys at the stations two times per month between mid-February and March 31 2012. When conducting outdoor research, some flexibility in scheduling is needed and some surveys were missed due to inclement weather.

Surveys periods at each point were 5-minutes in length with a conspecific broadcast for the first minute. During the survey the locations, flight paths and/or perched locations of Short-eared Owls and other observed sensitive species within 500-m

radius were recorded. Each observation included the collection of the following data: survey point number, observation number, time when observed, species or best possible identification, direction and distance of the bird from the observer, number of individuals, if the observation included an auditory response, gender (if possible), the activity (behavior) based on the point of first observation (perched, gliding, soaring, hovering, flapping, auditory, hunting, other), flight height (altitude above ground when first observed within 500-m of the survey point), and habitat(s) or the vegetation type in which or over which the bird occurred based on the point of first observation within 500-m radius of the survey point (corn stubble, bean stubble, beat stubble, grass, pasture, winter wheat, bare dirt, or other). Technicians used landmarks as reference when measuring distance to birds and flight altitude (Fig. 2). Any additional notes or clarification were also recorded for each observation if appropriate. Any additional general comments about the survey were included in the general comment section. Each survey point was visited two times per month between February and March 31, 2012.



Figure 2. In the winter of 2012 observers surveyed the viewshed for Short-eared Owls from the viewing stations in the Cross Winds Project Area.

Results and Summary

Short-eared Owl Surveys – Winter 2012

During the 222 Short-eared Owl surveys observers detected two Short-eared Owls (Fig. 3) as well as six Snowy Owls. Both observations of Short-eared Owls were at the same survey point, but several weeks apart.

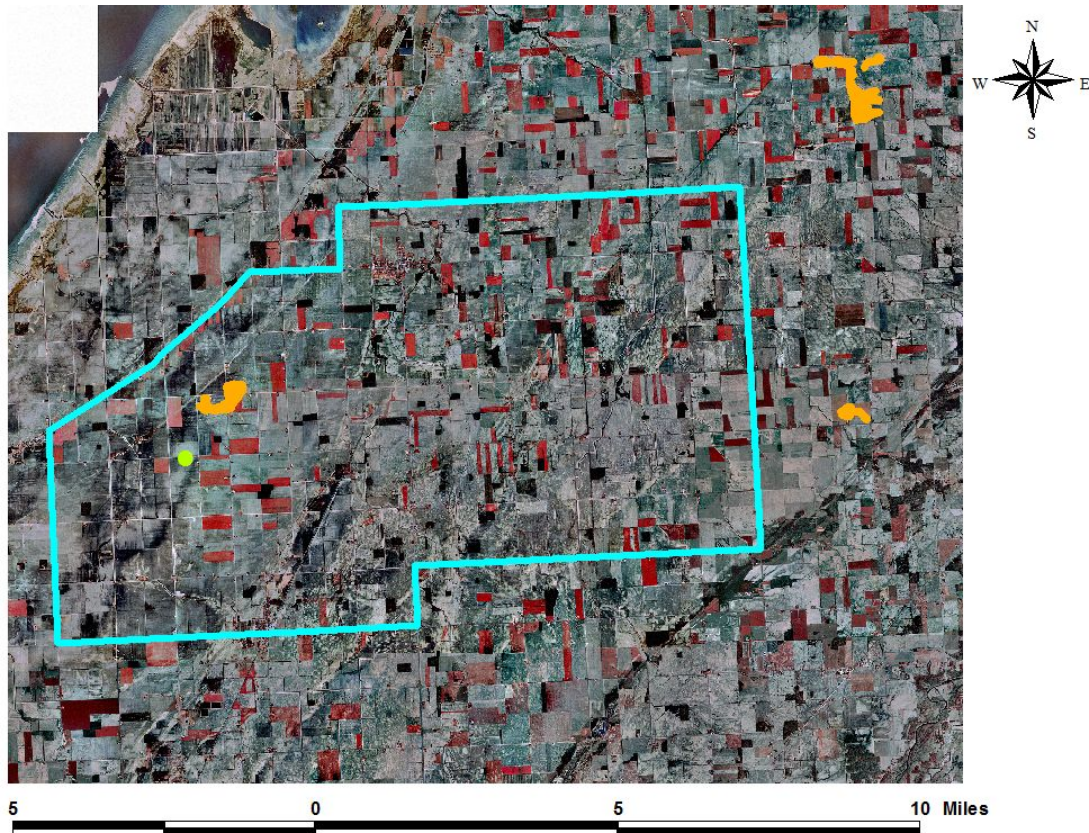


Figure 3. Short-eared Owl surveys were conducted in the late winter of 2012 in Tuscola County, MI in and around the Project Area proposed for wind energy development. Two Short-eared Owls were detected both in the same location (green dot). During other large bird surveys in late 2011 Short-eared Owls were detected and their flights paths delineated (orange areas).

During large bird surveys there was a total of 15 Short-eared Owls detected (Fig 3). Assuming the potential wind turbine rotor-swept area (RSA) would be 50 – 150 m above the ground, 100% of all birds flew below the RSA, 0% within the RSA, and 0% flew above the RSA. The mean flight altitude of Short-eared Owls was 3 m and the maximum flight altitude was 5 m (47 m and 45 m below the RSA, respectively).

Summary of Short-eared Owl flight behavior in the Project Area

The state endangered Short-eared Owl was present in the Project Area but was not common. This species has only been detected in the Project Area during the winter months. When using the area, Short-eared Owls specifically used grassy roadside ditches and grassy fields within the matrix of dormant winter crop fields. This is consistent with other studies

of the wintering habitat of Short-eared Owls. Bosakowski (1986) and Holt and Leasure (1993) state that while grassland is the preferred winter habitat of the species, dormant crop land is also used. Upon examination of the Short-eared Owl data, it appears that the flight behavior of this species did not put them at frequent risk of collisions with wind turbines. Their flight altitude was lower than the RSA of the turbines. To further decrease the risk of turbine collisions with this state endangered species I suggest avoiding grasslands when siting wind turbines.

Acknowledgments

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