

**Avian Research for the Proposed Blissfield Proposed Wind Energy Site:
Summary of Fall 2010 Field Season
DRAFT**



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9 December 2010
2010 - 28



MICHIGAN STATE
UNIVERSITY
EXTENSION

Executive summary

Avian collisions with wind turbines have been documented in the Midwest, but the frequency of those collisions is site and situation specific. In addition to collision risks, some grassland or open-land nesting bird species are not adapted to nesting or utilizing areas near any tall structures, including wind turbines, and can be displaced. Due to the potential for avian collisions with wind turbines or turbine related avian displacement from previously used areas, we conducted avian surveys to better understand the densities of birds in the Project Area, as well as the species composition. These data will help wind energy developers and resource managers to make appropriate decisions regarding the potential impacts to birds and the methods by which they might reduce those impacts.

In an effort to quantify the bird use of the Project Area, we collected point count data to estimate migratory bird densities in September - November 2010. Surveys of point count stations detected 265 birds of 22 species with a mean of 16.6 birds per point count visit. Several of the agricultural / open land species observed in the Project Area are thought to be sensitive to the presence of tall structures in their breeding and foraging habitats, potentially forcing their displacement. Row crop agricultural fields, which make up the majority of the Project Area, would tend to have fewer of those species sensitive to the presence of tall structures than those species found in pastures and hayfields. This Project Area appears to be in an area with common species and no rare species of birds were observed.

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Introduction

Avian collisions with wind turbines have been documented in the Midwest, but the frequency of those collisions is site and situation specific. Songbird collisions with turbines, as well as with other tall structures, are related to the lighting systems of the structure (Gehring et al. 2009). Songbirds can become attracted to non-blinking lights, especially during nocturnal migration thereby increasing their risk of collision with any structure illuminated with these types of lights. Most turbines are lit with Federal Aviation Administration recommended blinking lights which decreases the likelihood of songbirds becoming attracted into the site. Birds that use the airspace within the rotor swept area of a turbine are at risk of a collision and therefore the frequency of avian collisions at turbine sites can be directly correlated to the density and behavior of birds in the local area.

Some of the windiest areas in Michigan have also been documented to provide important habitat for wildlife, including migratory songbirds, waterfowl, and raptors. In addition to collision risks, some grassland or open-land nesting bird species are not adapted to nesting or inhabiting areas near any tall structure, including a wind turbine (Strickland 2004). These species can be displaced from traditional nesting areas and avian use areas upon construction of a nearby wind turbine (Leddy et al. 1999).

Due to the potential for avian collisions with wind turbines or turbine related avian displacement from nesting and general use areas, we conducted avian surveys to better understand the densities of birds in the area as well as the species composition and habitat use. These data will help wind energy developers and resource managers to make

appropriate decisions regarding the potential impacts to birds and the methods in which they might mitigate those impacts.

Study Site and Methods

Study site and description

Research was conducted in the Project Area within Lenawee County, located in southeastern Michigan, USA (Fig. 1). The land use / land cover of the Project Area consists mainly of agricultural fields (e.g, corn, soybeans, and wheat), with some pastures, forested areas, and some small wetlands. Various streams and drains traverse the Project Area within the watershed of the River Raisin, which runs partially within and to the north of the Project Area. The natural vegetation in this area is generally described as mesic forests, wet forests and forested riverine corridors. The forest overstory typically includes components of maple (*Acer* spp.), oak (*Quercus* spp.), ash (*Fraxinus* spp.) and cottonwood (*Populus deltoides*) with an understory of bracken fern (*Dennstaedtiaceae* spp.). The land type is predominantly Ann Arbor Moraine and Maumee Lake Plain (Albert 1995) which is predominantly flat with some gently sloping areas. Historically, the northern portion of the Project Area was vegetated with beech-sugar maple forest and the southern portion was predominantly mixed hardwood swamp which is now drained for agricultural use (Comer et al. 1995). The Project Area is approximately 22 – 29 miles from the Lake Erie lakeshore, which is considered to be a concentration area for migratory birds.

Migratory bird surveys

In an effort to quantify the songbird use of the Project Area, we collected data using methods similar to those used in studies estimating breeding bird densities (Reynolds 1995, Johnson et al. 2000). Eight point count locations were established within the Project Area (Fig. 1). Surveys were conducted four times in September - November 2010 to focus on quantifying the birds migrating through the Project Area in the fall.

Surveys at point count sites were 7 min. long (after 2 minutes of silence) and conducted between 15 minutes before sunrise and 1030 AM EST. Technicians recorded

the following data: date, survey start time, temperature, wind speed, wind direction, cloud cover. Each individual bird observed during a survey was recorded by species, as well as the azimuth to the bird, gender (if known), distance from the observer, estimated flight height (if applicable), and other comments.



Figure 1. The Blissfield Project Area in southeastern Michigan, Lenawee County is predominantly agricultural lands with some interspersed forested areas. Point count sites were established and surveyed in September – November 2010 for migratory bird use.

Results and Summary

Migratory bird surveys

We visited 8 point counts in the Blissfield Project Area four times between September and November 2010. Surveys of point count stations detected 265 birds of 22 species (Table 1, Appendix A). We detected a mean of 16.6 birds per point count visit (mean of 3.3 species / survey; Table 1).

The most abundant bird groups per survey were the invasive species (11.4 birds / survey), followed by an equal abundance of shorebirds, larks, and corvids (0.9 birds /

survey), and a similar abundance of raptors (0.8 birds / survey) (Table 2). These species groups were consistent with the open / agricultural habitats found in the Project Area. The majority of the bird species detected in the Project Area were generalists or those species that select more open habitats as compared to more forest dwelling species within their respective taxonomic group.

Research has suggested that several of the species observed in the Project Area are sensitive to the presence of tall structures in their breeding and foraging habitats, forcing their displacement (Strickland 2004). Those sensitive species include: Eastern Meadowlark, Snow Bunting, Horned Lark, and Northern Harrier. The point counts where we detected 3 or more of those species are highlighted in Figure 2. Horned Larks in the Project Area were the area-sensitive species most commonly found in the points delineated in Figure 2. Row crop agricultural fields would tend to have fewer of these sensitive species than pastures and hayfields. Construction of wind turbines in the areas that support species sensitive to tall structures may result in these species avoiding areas previously utilized. Overall, most of the species of birds detected in the Project Area were habitat generalists and fairly common in the region.

Table 1. Avian abundance and richness in the Blissfield Project Area proposed for the development of wind energy. Data were collected in September - November 2010 at point count sites.

No. Species	20
Mean No. Individuals / Survey	16.6
Mean No. Species/Survey	3.3

Table 2. Mean bird abundance in the Blissfield Project Area proposed for the development of wind energy. Data were collected in September - November 2010 at point count sites.

Group	Mean Abundance ^a
Blackbirds	<0.1
Chickadees/Nuthatches	<0.1
Corvids	0.9
Finches/Buntings	0.3
Hawks/Raptors	0.8
Invasives	11.4
Larks	0.9
Shorebirds	0.9
Sparrows	0.3
Thrushes	<0.1
Waterfowl	0.1
Woodpeckers	0.3

^a Mean Abundance = mean number of individuals observed per survey



Figure 2. Point count sites were established Lenawee County, MI in the Blissfield Project Area proposed for wind energy development. Point count sites were surveyed in September - November 2010 for bird use. Those points highlighted with yellow circles included 3 or more detections of open area species potentially sensitive to the construction of tall structures.

Conclusions

The Blissfield Project Area is predominantly agricultural fields (e.g, corn, soybeans, and wheat), with some small grassy pastures and some small forested areas. Natural habitats are not readily available in the Project Area, which minimizes the likelihood of the presence of rare species of birds. Avian collision rates at wind farms tend to be positively correlated with the densities of birds using the wind farm. Therefore, the limited amount of habitat for rare bird species in the Blissfield Project Area and the lack of detected rare bird observations in the fall of 2010 suggest that collisions of rare bird species with turbines would be unlikely in this Project Area.

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Appendix A. List of bird species observed during bird surveys conducted in Lenawee County, MI, in sites proposed for wind energy development. This sites was surveyed in 2010 for bird use.

Species ^a	AOU code
Canada Goose	CAGO
Red-tailed Hawk	RTHA
Cooper's Hawk	COHA
Northern Harrier	NOHA
Turkey Vulture	TUVU
Killdeer	KILL
Rock Pigeon	ROPI
Red-bellied Woodpecker	RBWO
Northern Flicker	NOFL
Downy Woodpecker	DOWO
Horned Lark	HOLA
American Crow	AMCR
Blue Jay	BLJA
White-breasted Nuthatch	WBNU
American Robin	AMRO
European Starling	EUST
Eastern Meadowlark	EAME
American Goldfinch	AMGO
Snow Bunting	SNBU
House Sparrow	HOSP

^a names of birds follow the AOU Check-list of North American Birds