Bald Eagle Surveys for the Cross Winds Proposed Wind Energy Site: Summary of the 2012 Field Seasons – Progress Report

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18 January 2013
(revised 4 February 2013)
2013 - 09

MICHIGAN STATE UNIVERSITY EXTENSION

Executive Summary

The development of wind energy has the potential to serve as a long term source of renewable energy. 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 Bald Eagles. Research across North America has demonstrated a relationship between the densities of birds in an area and the numbers of avian collisions. Avian collisions with wind turbines have been documented but the frequency of those collisions is site and situation specific. The United States Fish and Wildlife Service (USFWS) recently developed the Draft Eagle Conservation Plan Guidance (USFWS 2011). These guidelines provide an approach that allows agencies and wind developers to assess the risks of wind projects to eagles. This project was designed with feedback from the USFWS and is hoped to contribute to a better understanding of how this proposed project may impact Bald Eagles.

We established 81 Bald Eagle survey stations in the Project Area. We conducted 1-hour surveys at the stations starting in February and continuing until December 31, 2012. Data were analyzed for the summer and fall of 2012 to complement the Bald Eagle report summarizing the data from February – May 2012. This report also includes Bald Eagle observations collected during 2012 Bald Eagle Surveys and from the more general Large Bird Surveys. During surveys, each Bald Eagle and sensitive status species was recorded in addition to the bird's flight path, flight direction, approximate flight altitude, and the distance to each bird from the observer. Observers also recorded the behavior and habitat use of focal species, and weather characteristics. Examination of the Bald Eagle survey data suggests that the flight behavior of most Bald Eagles may put them at risk of collision.

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Introduction

The development of wind energy diversifies our sources of energy and is renewable. 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 Bald Eagles. Research across North America has demonstrated a relationship between the densities of birds in an area and the numbers of avian collisions. Avian collisions with wind turbines have been documented but the frequency of those collisions is site and situation specific. 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 of birds in the local area. The United States Fish and Wildlife Service (USFWS) recently developed the Draft Eagle Conservation Plan Guidance (USFWS 2011). These guidelines provide an approach that allows agencies and wind developers to assess the risks of wind projects to eagles. This project was designed with feedback from the USFWS and is hoped to contribute to a better understanding of how this proposed project may impact Bald Eagles.

Study Site and Methods

Study site and description

Research was conducted in the Project Area within Tuscola and Huron Counties, 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, 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 2.0 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.

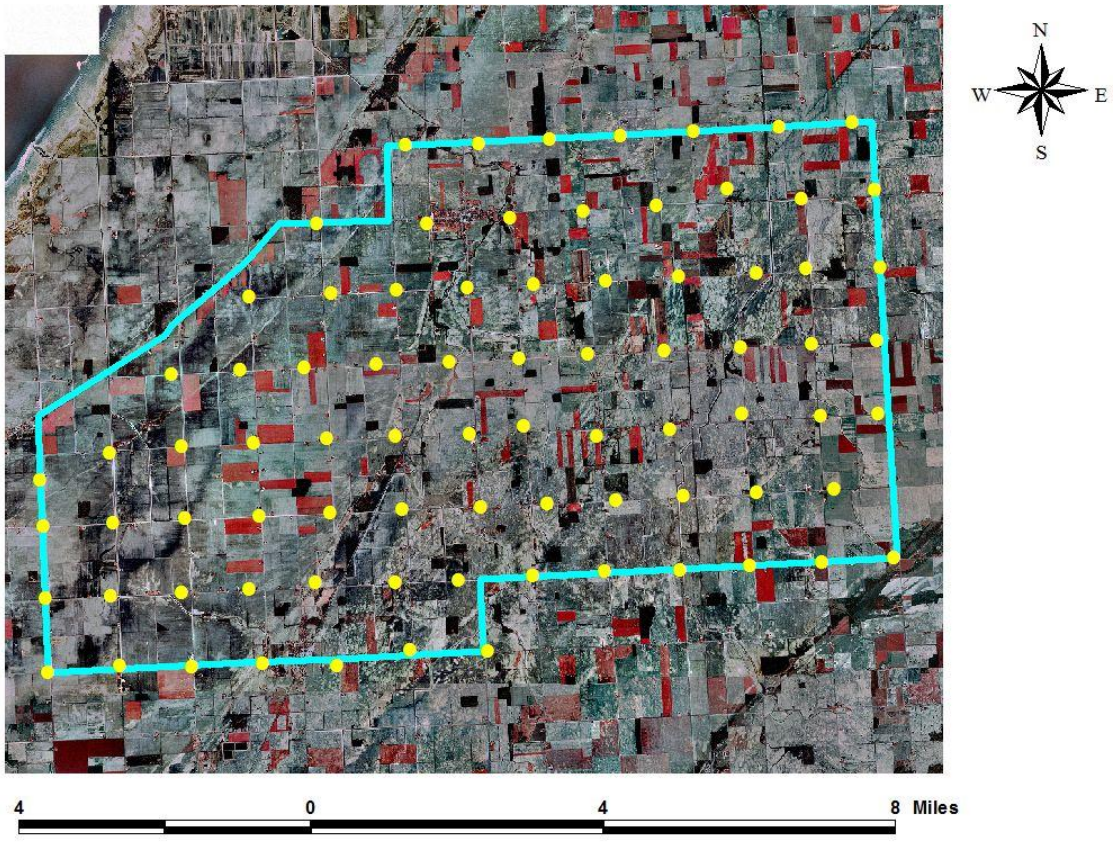

Figure 1. Bald Eagle viewing stations (yellow dots) were established in Tuscola and Huron Counties, MI in and around the Project Area proposed for wind energy development (blue boundary). Bald Eagle surveys were conducted at the viewing stations between February and December 2012. The Project Area is predominantly agricultural lands with some interspersed forested areas.

Bald Eagle and Large Bird surveys

We established 81 Bald Eagle viewing stations in the Project Area. These stations provided the best possible viewsheds of the proposed project sites (Fig. 1). Following methods similar to those used by Hawkwatch International, we conducted 1-hour surveys at the stations starting in February and continuing through the rest of 2012, with a specific analysis of June – December data to complement the earlier report focused on February – May 2012.

In addition we established seven raptor and other large bird viewing stations in the Project Area. Similar to the Bald Eagle stations these provided the best possible viewsheds of the proposed project sites (Fig. 2). Following methods similar to those used by Hawkwatch International, we conducted 1-hour surveys at the stations in April-May 2012 (spring migration) and again in September- October 31, 2012 (fall migration). When conducting outdoor research, some flexibility in scheduling is needed and some surveys were missed due to inclement weather.

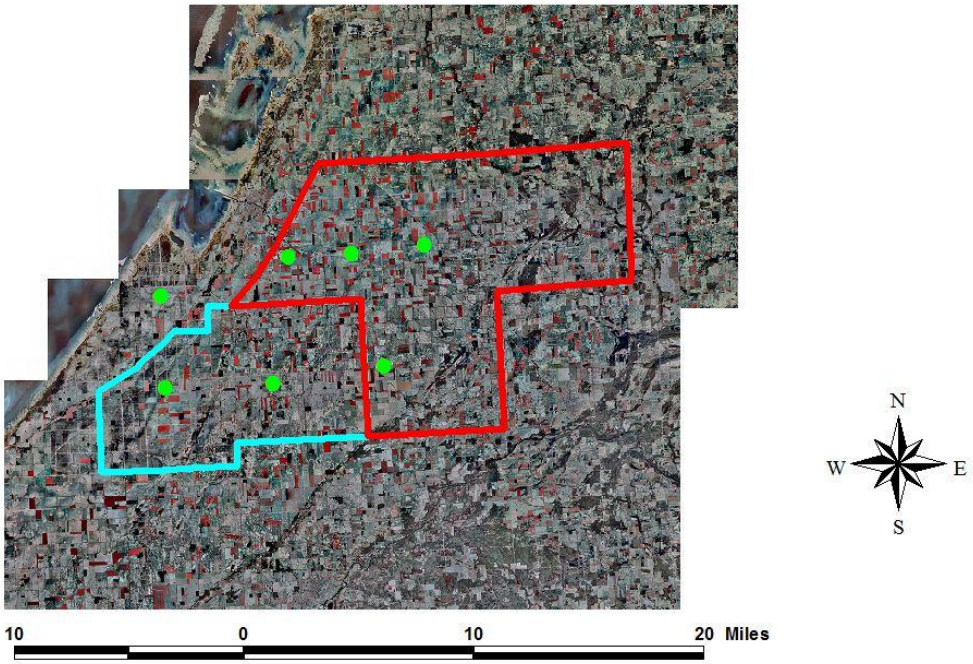

Figure 2. Large bird viewing stations (green dots) were established in Tuscola and Huron Counties, MI in and around the Project Area proposed for wind energy development. Large bird surveys were conducted at the viewing stations in the spring and fall of 2012. The Project Area is predominantly agricultural lands with some interspersed forested areas. Blue lines designate phase 1 and red is phase 2 of the Project Area.

During surveys each Bald Eagle (for species specific surveys), raptor, large bird, and sensitive status species was recorded in addition to the bird's flight path, flight direction, approximate flight altitude (lowest and highest flight altitude), whether it flew within the proposed project area, and the distance to each bird from the observer. Technicians used landmarks as reference when measuring distance to birds and flight altitude (Fig. 3). Technicians also recorded the behavior and habitat use of each bird. Behavior categories were as follows: perched (PE), soaring (SO), flapping (FL), flushed (FH), circle soaring (CS), hunting (HU), gliding (GL), and other (OT, noted in comments). Any comments or unusual observations were also noted. Weather data were collected in concert with large bird surveys; specifically, temperature, wind speed, wind direction, and cloud cover. The date, start, and end time of observation period, species or best possible identification, number of individuals, sex and age class, distance from plot

center when first observed, closest distance, height above ground, activity, and habitat(s) were recorded.

Figure 3. In 2012 observers surveyed the viewshed for large birds from the viewing stations in the Cross Winds Project Area.

Results and Summary

Bald Eagle surveys – Summer and Fall 2012

During the 577 Bald Eagle surveys, observers detected two Bald Eagles and 7 other individual rare birds of 1 species (Tables 1 and 2). There was a mean of 0.004 Bald Eagles detected per survey (Table 1).

Assuming the wind turbine rotor-swept area (RSA) would be 50 – 150 m above the ground, 50% of all Bald Eagle observations were below the RSA, 0% within the RSA, and 50% flew above the RSA. The mean flight altitude of Bald Eagles was 155 m (Fig. 3).

Table 1. Bald Eagle abundance in Tuscola and Huron Counties, MI in and around the Project Area proposed for the development of wind energy by Consumers Energy. Data were collected in the summer and fall of 2012 at 81 Bald Eagle survey sites.

	Bald Eagle surveys
No. Bald Eagles	2
Mean No. Bald Eagles / Survey	0.004

Table 2. Rare species detected during Bald Eagle surveys in Tuscola and Huron Counties, MI in and around the Project Area proposed for the development of wind energy by Consumers Energy. Data were collected in the summer and fall of 2012 at 81 Bald Eagle survey sites.

Species	Number detected
Bald Eagle	2
Bobolink	7

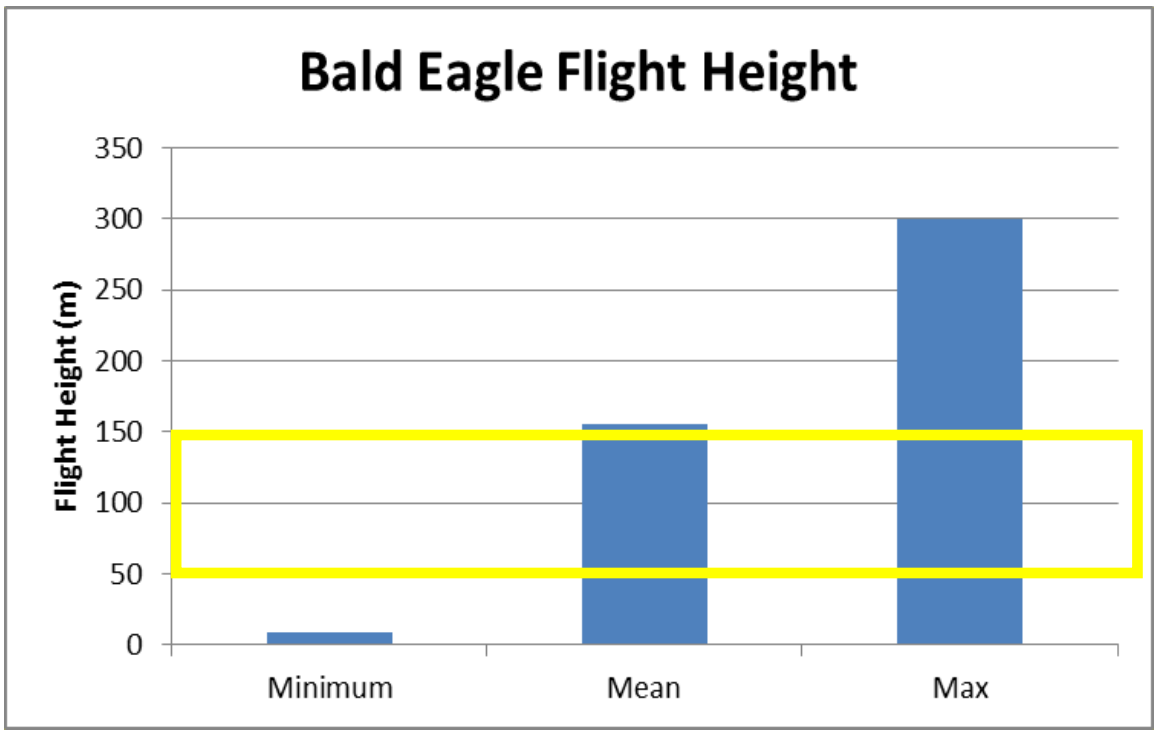

Figure 3. In the summer and fall of 2012 Bald Eagle surveys were conducted in Tuscola and Huron Counties, Michigan, in and around the Project Area proposed for the development of wind energy by Consumers Energy. The wind turbine rotor swept area (RSA) is designated by the yellow rectangle. Fifty percent of Bald Eagles flew below the RSA and 50% flew above the RSA (n=2).

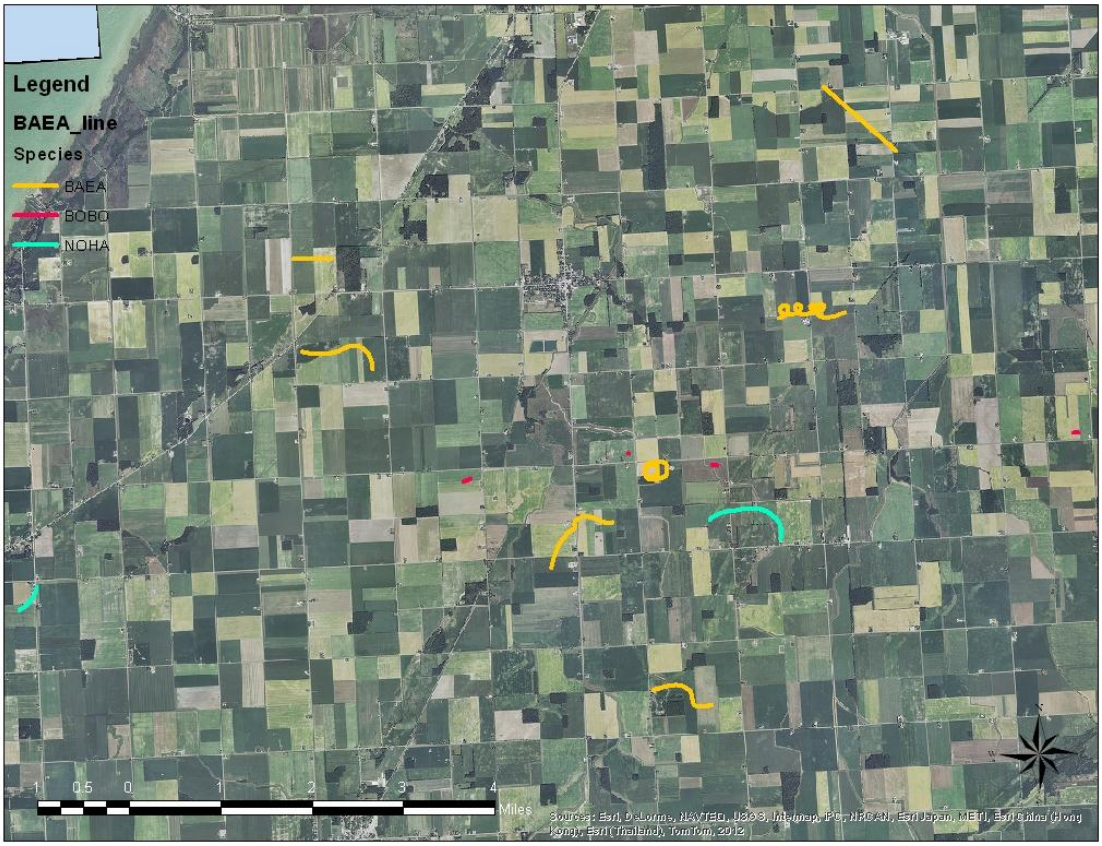

Figure 4. In 2012 Bald Eagle surveys were conducted at 81 viewing stations in the Cross Winds Project Area, Michigan. The orange lines represent the flight paths Bald Eagles, the red are Bobolink detections, and the blue are Northern Harrier locations. These data are from all of 2012.

Figure 5. In 2012 large bird surveys were conducted at 7 viewing stations in the Cross Winds Project Area, Michigan. The orange lines represent the flight paths of Bald Eagles detected during those general surveys for large birds. These data are from all of 2012.

Bald Eagle observations from both surveys types in 2012

Observers detected 17 Bald Eagles in 2012 while conducting Large Bird surveys and Bald Eagle surveys. Assuming the wind turbine rotor-swept area (RSA) would be 50 – 150 m above the ground, 29% of all Bald Eagle observations were below the RSA, 41% within the RSA, and 29% flew above the RSA. The mean flight altitude of Bald Eagles was 111 m (Fig. 6).

Upon examination of 2012 Bald Eagle data, it appears that their flight behavior may put them at frequent risk of collisions (Fig. 6). Figure 7 demonstrates that most Bald Eagles were observed in the months of May and September. While interpretation of this trend is potentially biased due to the fact that there was increased survey effort during these months it is also important to note that no Bald Eagles were detected in the Project Area in February, March, June, August, November, and December. Flight paths of Bald Eagles may

be useful for further evaluation of the frequency in which Bald Eagles will fly in close proximity to wind turbines (Fig. 8).

I suggest that Consumers Energy continue working with the United States Fish and Wildlife Service in consideration of these records and the Draft Eagle Conservation Plan Guidance (USFWS 2011).

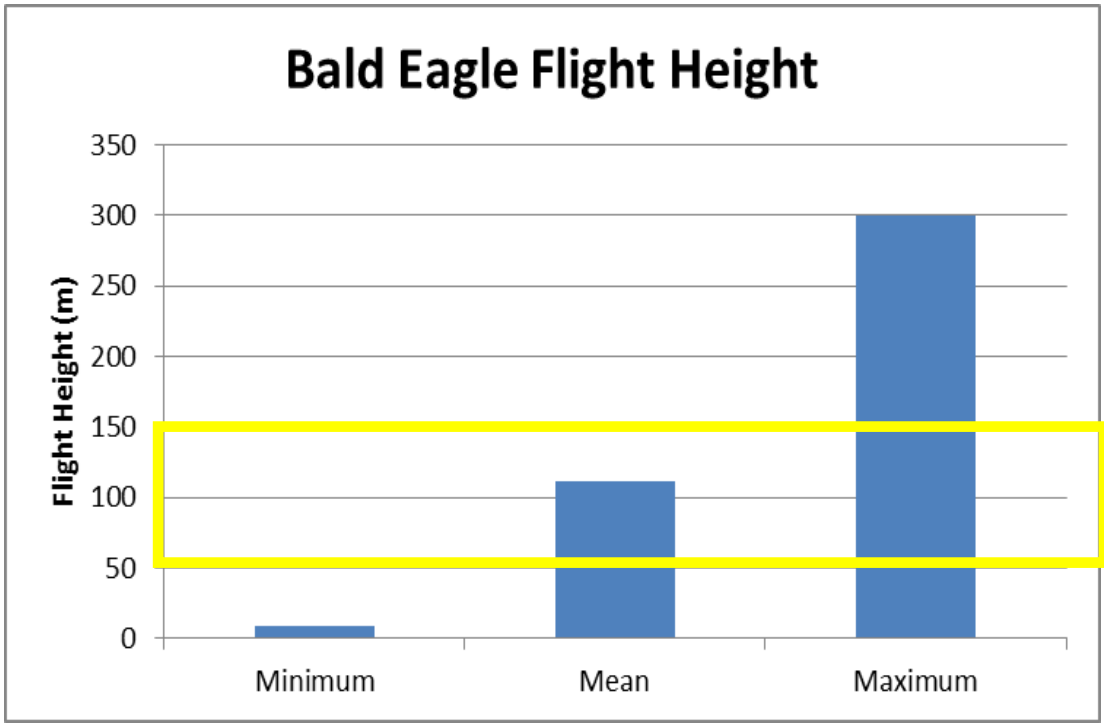

Figure 6. In 2012 Bald Eagle surveys and Large Bird surveys were conducted in Tuscola and Huron Counties, Michigan, in and around the Project Area proposed for the development of wind energy by Consumers Energy. The wind turbine rotor swept area (RSA) is designated by the yellow rectangle. Twenty-nine percent of all Bald Eagle observations were below the RSA, 41% within the RSA, and 29% flew above the RSA. The mean flight altitude of Bald Eagles was 111 m

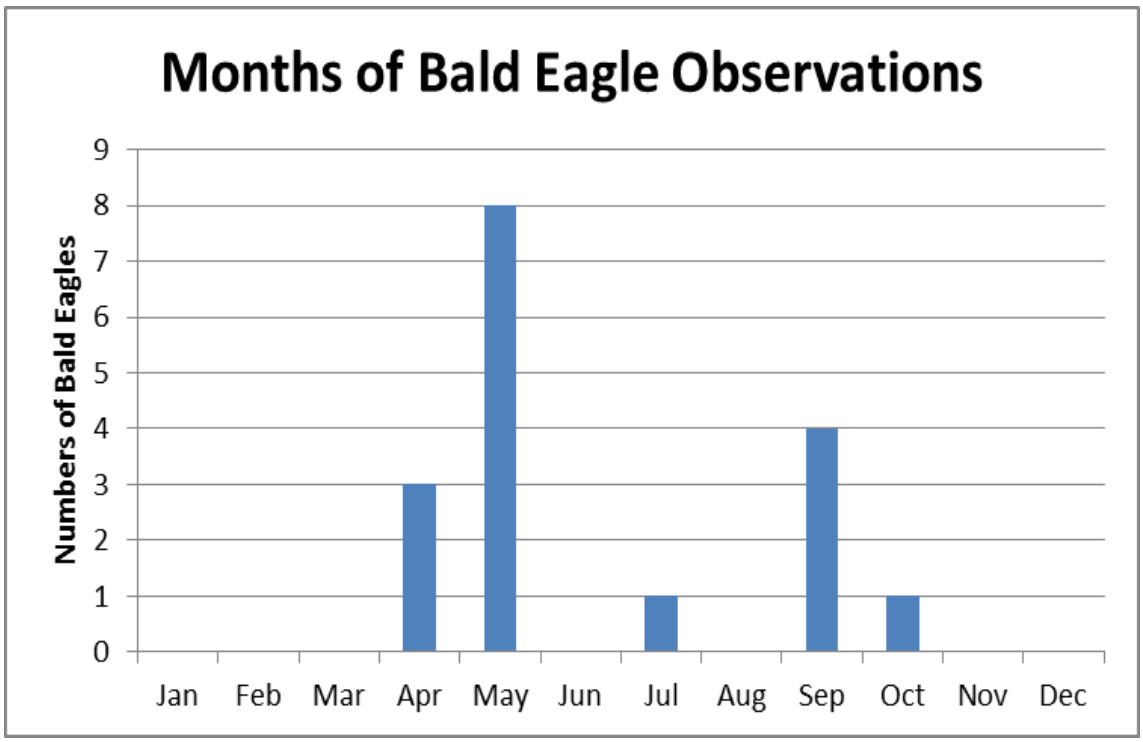

Figure 7. In 2012 Bald Eagle surveys and Large Bird surveys were conducted in Tuscola and Huron Counties, Michigan, in and around the Project Area proposed for the development of wind energy by Consumers Energy. Data were collected February through December, with increased survey effort in April, May, August, September, and October.

Figure 8. In 2012 large bird surveys and Bald Eagle surveys were conducted in the Cross Winds Project Area, Michigan. The orange lines represent the flight paths of Bald Eagles detected during those surveys. These data are from all of 2012.

Acknowledgments

S. Roys, D. Morris, K. Walter collected the majority of the data for this project. The following individuals provided suggestions for this study: M. Stuber, B. Fisher, J. Dingledine, and S. Hicks at the United States Fish and Wildlife Service, K. Cleveland and her colleagues at the Michigan Department of Natural Resources. I would like to express my gratitude to M. O'Connor (Consumers Energy) for her involvement in the process of including natural resource issues in the development of these wind energy projects. My colleagues at the Michigan Natural Features Inventory provide logistical and technical support; especially, Brian Klatt, Sue Ridge, Nancy Toben, Helen Enander, and Rebecca Rogers.

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