APPENDIX &

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September 2011

Avian and Bat Assessment

Review of Potential Avian and Bat Mortality

Community Wind South, LLC

Nobles County, Minnesota

WSB Project Number: 2033-000

PREPARED FOR:

Minwind, LLC
800 S. Kniss Ave, Suite 2
Luverne, MN 56156
507-283-9140

PREPARED BY:

WSB & ASSOCIATES, INC.
701 XENIA AVENUE SOUTH
SUITE 300
MINNEAPOLIS, MN 55416

Table of Contents

I. Introduction and Purpose **1**

II. Methodology **1**

III. Review of Literature **3**

IV. Description of Habitat Within the Project Area **8**

V. Results and Conclusions **7**

VI. References **12**

List of Appendices

Appendix A: Figures
Figure 1. Project Location
Figure 2. Land Cover
Appendix B: Agency Correspondence

I. Introduction and Purpose

Community Wind South, LLC is planning to construct the Community Wind South, LLC Wind Farm Project (Project) in Nobles County, Minnesota. The Project will be located in south-central Nobles County in Larkin and Summit Lake Townships about two miles south of Wilmont, MN (**Figure 1**). Community Wind South, LLC has designated approximately five square miles as the Project Area to provide siting flexibility and to allow sufficient room for buffer around sensitive habitat areas.

The Project involves constructing up to 15 REPower 2.0 MW turbines, access roads, and a collection system. It is Community Wind South, LLC's objective to identify the potential wildlife impacts to inform the siting of these facilities and reduce impacts. In general, wind turbines have the potential to increase avian and bat mortality in certain geographic areas and proper siting of wind turbines is important to reduce impacts on wildlife.

The purpose of this study is to identify potential impacts the Project will have on avian and bat species. Birds and bats share many life-history characteristics including some types of habitat and migratory patterns. As a result, birds and bats are susceptible to similar anthropogenic threats such as wind turbines. This assessment addresses both avian and bat species concurrently due to their shared vulnerabilities to wind turbine impacts.

WSB & Associates, Inc (WSB) solicited and analyzed available information from expert sources, evaluated habitat, analyzed information from past studies for similar wind projects, and conducted site visits over approximately five square miles (**Figure 1**).

II. Methodology

A number of studies have been conducted throughout the United States on the mortality rate of birds and bats from collisions with wind turbines, as well as the influence of wind turbines on population densities. We reviewed past studies that were completed in the region (Minnesota and Iowa) to investigate the influence of wind farms on avian and bat mortality rates and population densities. These studies were used to augment the results of the field surveys and approximate the potential bird, bat, and sensitive species impacts resulting from the Project. The past studies that were reviewed include the following:

- Arnet, E.B., et al. 2008. Patterns of Bat Fatalities at Wind Energy Facilities in North America. Journal of Wildlife Management. 72(1):61-78.

- Higgins, K. F., R. G. Osborn, and D. E. Naugle. 2007. Effects of Wind Turbines on Birds and Bats in Southwestern Minnesota, U.S.A. pp 153-175 *in* M. de Lucas, G. F. E. Janss, and M. F. Baena, editors. Birds and Wind Farms: Risk Assessment and Mitigation.

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These studies were reviewed and are summarized in this report. Additionally, the habitat present within the Project Area was reviewed and generally compared to the habitat at the wind energy sites in the studies.

The U.S. Fish and Wildlife Service's ("USFWS") Wind Turbine Advisory Committee Recommendations (March 2010) were used to conduct preliminary site assessments for the Project. The Recommendations consist of a tiered approach.

Tier 1 involves a preliminary evaluation or screening of potential project sites. This was completed by performing a desktop evaluation of the Project Area to determine if species or habitats of concern were present in the immediate vicinity of the Project Area. Publically available information was collected from available Federal, State, and local resources regarding wildlife and habitat within the Project Area. This data collection effort included requesting and/or obtaining information from the following sources:

- Department of Natural Resources ("DNR")
- DNR Natural Areas Inventory
- USFWS
- Breeding Bird Survey
- Minnesota Ornithologists' Union

Tier 2 is site characterization, which involves determining if any site-specific risks to wildlife could occur as a result of wind development. This was completed by contacting the following authorities to determine if any risks to wildlife resources existed within the site:

- DNR Environmental Review Unit
- DNR Natural Areas Inventory
- USFWS

Responses received from the above-listed agencies are available in **Appendix B**. Field visits by WSB biologists were also conducted within the Project Area in July 2011 to review wildlife habitat and conduct a windshield survey for the various avian species that occupy the site.

Tier 3 consists of field studies to document the wildlife conditions on site and predict project impacts. To date, Tier 1 and 2 of the Recommendations have been completed. The DNR considers the Project Area to be low risk for impacts to birds or bats and, as such, does not recommend pre-construction surveys. As a result, no Tier 3 studies were completed.

From a thorough review of the information provided as well as the Project Area visits in 2011, general observations and conclusions were developed and are outlined in **Section IV**.

III. Review of Literature

The past studies referenced above were reviewed to identify the potential impact wind turbines could have on avian and bat populations in the region. The studies reviewed for this report were conducted in Lincoln and Pipestone Counties in southwestern Minnesota, Worth County in north-central Iowa, and various states throughout the United States and Canada (Arnett et al., 2008). These studies demonstrate that several factors, including surrounding habitat, abundance of avian and bat species, and wind turbine locations play a role in the potential impact of wind projects on birds and bats. A summary of the results of these studies is provided below:

- **Patterns of Bat Fatalities at Wind Energy Facilities in North America (2008).** This study compiled existing information on patterns of bat fatalities from 21 post-construction fatality studies conducted at 19 facilities in the United States and Canada. The study presents analytical results from individual studies. Because of its proximity to the Community Wind South, LLC Wind Project, annual fatality estimates from three bat mortality studies conducted by Johnson et al. (2003, 2004) on the Buffalo Ridge area of Minnesota were summarized and are provided: average estimated mean fatality/turbine:

1.4; average estimated mean fatality/MW: 1.9; average estimated mean fatality/2000-m^2 rotor-swept area: 1.6. The number of bat fatalities for the Minnesota studies were relatively low compared to other regions in the United States and significantly lower than those projects located in the Eastern United States (average of 37 fatalities per turbine) which were mostly located on deciduous forested ridges as compared to the largely agricultural fields of the Minnesota projects.

Overall the study found the following:

1. Bat fatalities were skewed toward migratory species and were dominated by lasiurine species (hoary bat, eastern red bat).
2. Throughout North America, fatalities most often occurred during midsummer through fall.
3. Fatalities were not concentrated at individual turbines and there were no consistent relationships between fatalities and habitat.
4. Strobe lights recommended by the Federal Aviation Administration did not affect bat fatality.
5. Bat fatalities were highest during periods of low wind speed.

A significant management consideration provided by Arnett et al. was that "curtailing operations during low wind periods (wind speed < 6 m/s), particularly in late summer and fall, could reduce bat fatality substantially."

- **Effects of Wind Turbines on Birds and Bats in Southwestern Minnesota (2007).** This study was conducted between 1994 and 1995 at the Buffalo Ridge Wind Resource Area, and the objective was to determine which species may be most susceptible to turbine collision, monitor activity of birds near turbines, determine if raptors were susceptible to turbines, and determine whether the density of upland birds in Conservation Reserve Program (CRP) grasslands was influenced by the presence of turbines.

  Eight birds and thirteen bats were thought to have died as a result of turbine collisions during 1994 and 1995. Neither habitat type (agricultural field vs. grassland) or season appeared to influence mortality for birds, but turbine location did. End turbines were associated with more bird deaths than mid-string turbines. On the other hand, bat fatalities appeared to be associated with habitat type and season, but not turbine location. More bats were killed by turbines in agricultural fields than CRP fields, and more during summer than any other season. The majority of the bats killed were either hoary bats (*Lasiurus cinereus*, 46%) or silver-haired bats (*Lasionycteris noctivagans*, 31%), both of which are foliage-roosting, migratory bats.

  Bird activity varied by group. Passerines appeared to fly below the turbine blades, whereas waterfowl and raptors flew closer. Grassland nesting birds appeared to avoid CRP grasslands containing turbines. Bird density was lower in grasslands that were within 80 meters of turbines when compared to grasslands that were at least 180 meters

from turbines. Raptors were found to nest in areas surrounding the wind plant, but no nests were found where turbines were present.

Overall, the authors suggest that the Buffalo Ridge WRA was of little threat to birds or bats.

- **Avian Monitoring Studies at the Buffalo Ridge, Minnesota Wind Resource Area: Results of a 4-Year Study (2000).** The Buffalo Ridge study took place between 1996 – 2000 in Lincoln and Pipestone Counties in Minnesota. Habitat within the study area in southwestern Minnesota included primarily agricultural areas with some Conservation Reserve Program ("CRP") fields. During the study, it was determined that the lowest mean flight height of birds in the area was between 1.8 – 6.0 meters for wrens, upland game birds, and sparrows. The highest mean flight heights were between 17.2 – 46.9 meters for blackbirds, water birds, and waterfowl. The rotor-swept height of the wind turbines ranged from 19.5-52.5 meters and 26-74 meters, depending on the type of turbine.

  This study also concluded that avian use in the Buffalo Ridge study area was highest in woodland habitat followed by wetland habitat and smallest in CRP and croplands. The further away the habitat, the less the birds were present in the study area.

  During the study, 31 avian fatalities occurred in the control plots without turbines and 55 avian fatalities occurred in test plots with turbines. The fatalities within the turbine plots included approximately 76% passerines, 9% waterfowl, 5% water birds, 5% upland game birds, 1.8% raptors, and 1.8% shorebirds. The average bird mortality per turbine ranged from 0.98 – 4.45 birds per turbine per year. In the control plots, the mean number of avian fatalities was 1.1 per plot. A total of 184 bat fatalities were found as part of the study, with the hoary bat (*Lasiurus cinereus*) being the most common bat involved in the fatality. The average bat mortality per turbine ranged from 0.26 – 2.04 bats per turbine per year.

  The results of the study showed that avian mortality at Buffalo Ridge was low compared to other United States wind plants. Most of the fatalities occurred within nocturnal migrant populations with little impact on resident breeding birds. Based on the number of fatalities at the turbine sites versus the control sites, the study concluded that the number of fatalities was likely inconsequential from a population standpoint.

- **Mortality of Bats at a Large-Scale Wind Power Development at Buffalo Ridge, Minnesota (2003).** The objective of this study was to estimate turbine-associated bat fatalities across the entire Buffalo Ridge Wind Resource Area and determine which species were at highest risk for collision. The study took place between 1996 and 1999, but additional data from 1994 and 1995 was also included in the evaluation.

  Thirteen bat fatalities were documented at the Phase I wind plant in 1994 and 1995, two in 1998, and five in 1999. The Phase II plant was completed in 1998 and 76 bat fatalities were recorded that year. Fifty-seven additional mortalities were recorded in

1999. Phase III of the wind plant was completed in 1999 and 44 bat mortalities were recorded that year. For all four years, the estimated mean mortality per turbine per year after correcting for searcher efficiency was 0.07 for the Phase I plant, 1.78 for the Phase II plant, and 2.04 for the Phase III plant.

Most (97%) of the bat fatalities occurred during the period from July 15th to September 15th. In addition, a subsample of carcasses indicated that the hoary bat (*Lasiurus cinereus*) and eastern red bat (*Lasiurus borealis*) comprised nearly 90% of the mortalities. Both of these factors indicate that migrating, rather than resident, populations of bats are most likely to collide with turbines.

- **Bat Interactions with Wind Turbines at the Buffalo Ridge, Minnesota Wind Resource Area: An Assessment of Bat Activity, Species Composition and Collision Mortality (2003).** This study investigated bat mortality from turbine impact within the Buffalo Ridge area in southwestern Minnesota. The bats were surveyed using ultrasonic sensors to detect bat echolocation calls from mid-June through mid-September of 2001 and 2002 to determine bat populations in the area. Mist net samples were also used to sample bat populations near the turbines to study the relationship between habitat and bat activity and mortality patterns.

  The results of the study indicated an average of 2.16 bat collision mortalities per turbine per year. The bat species involved were mostly hoary bats with lesser involvement of eastern red bats (*Lasiurus borealis*), big brown bats (*Eptesicus fuscus*), silver haired bats (*Lasionycteris noctivagans*), and little brown bats (*Myotis lucifugus*). Neither the habitat variables nor the species composition of the resident bat population correlated with the bat fatalities, suggesting that the bat mortality involved migrating bats. Additionally, the study indicated that there were relatively large breeding populations of bats near the wind plant that experienced little to no collision mortality. The research states that collision fatalities were rare compared to the high amount of bat activity in the area. The results of this study suggest that the bat mortality associated with wind turbines is not large enough to cause large-scale population impacts.

- **Avian Mortality Associated with the Top of Iowa Wind Farm (2004 and 2005)**. This study investigated bird and bat mortality for a wind farm site in north-central Iowa that went into operation in 2001, referred to as the Top of Iowa (TOI). The wind farm site is near the town of Joice in Worth County, Iowa. The site of this wind farm is in an environmentally sensitive area on cropland located between three Wildlife Management Areas ("WMAs") with historically high bird use. Migrant and resident waterfowl as well as shorebirds, raptors, and songbirds were known to cross the cropland areas traveling among the WMA areas. Monitoring occurred in 2003 and 2004.

  Turbine areas were searched randomly for bird and bat mortalities and bat detectors were used to compare bat activity at turbine and non-turbine sites. In 2003, two birds and 30 bats were found to have been impacted by the turbines. In 2004, five birds and 44 bats appeared to have died as a result of collisions with the turbines. The results also showed that there was no significant difference between bat and bird activity at turbine sites than

at non-turbine sites. The results showed that avian mortality is minimal. Bat mortality was higher during fall migration. The species of bat that had the higher mortality rates was the hoary bat, which is similar to the 2003 Buffalo Ridge study.

- **Effects of Wind Turbines on Upland Nesting Birds in Conservation Reserve Program Grasslands (1999)**. This study investigated the influence of wind turbines on densities of upland nesting birds in Conservation Reserve Program ("CRP") areas. The study was conducted on the Buffalo Ridge Wind Resource Area ("WRA") in southwestern Minnesota during the summer of 1995. Bird surveys were conducted on six CRP plots, three with turbines and three without turbines. Surveys on CRP plots with turbines were conducted at distances of 0, 40, 80, and 180 meters from the turbines.

  Ten bird species were detected during the surveys. Total bird density was lower in CRP plots with turbines than in CRP plot without turbines. Bird density in the CRP plots with turbines increased with increasing distance from the turbines. There was no difference in bird densities between surveys conducted at 180 meters from turbines and in CRP plots without turbines. The results suggest that upland nesting birds may avoid using grasslands with turbines within a distance of 80 meters.

- **Bird Mortality Associated with Wind Turbines at the Buffalo Ridge Wind Resource Area, Minnesota (2000)**. This study investigated the impact of wind turbines on bird mortality on the Buffalo Ridge Wind Resource Area ("WRA") in southwestern Minnesota. Mortality searches were carried out on the site between April 1994 and December 1995. Observer search efficiency, decomposition rate, and scavenger studies were also carried out during this time to allow for correction of data.

  During the observer efficiency studies nearly 80% of dead birds were recovered. Scavengers removed approximately 40% of carcasses. Bird carcasses were recognizable up to seven days during the decomposition studies. Taking all of these biases into account, researchers estimated that between 24 and 48 birds were killed by turbines during a one year time period, which equated out to <1 bird/turbine/year. The results suggested that while the turbines did not appear to kill more birds than other man-made structures, proper turbine siting is still an important consideration to avoid bird mortality.

- **Bird Flight Characteristics Near Wind Turbines in Minnesota (1998).** This study investigated the height and distance from wind turbines at which birds flew on the Buffalo Ridge Wind Resource Area ("WRA") in southwestern Minnesota. Bird activity surveys were conducted in three units in and around the WRA during 1994-1995. One unit contained wind turbines and the other two did not. Species, flight height, and distance from nearest wind turbine were recorded for each bird observed.

  During both years, 59 species of birds were observed on the Buffalo Ridge WRA. Nearly 40% of observations were made up of only four species. Between 82-84% of birds flew above or below the rotor swept area of the wind turbines. Most birds (75-80%) flew 31 m or further away from the wind turbines. In 1995, fewer birds were

observed on the unit with turbines than on the two units without turbines, suggesting that the birds avoided flying in the areas with wind turbines. The results suggested that waterfowl and raptors had flight characteristics that made them susceptible to turbine collisions; whereas passerines generally flew well below the height of the turbine blades.

IV. Description of Habitat within the Project Area

The Project is located in southwest Minnesota in Nobles County (**Figure 1**). County Road 13 (Jones Avenue) and County State Aid Highway 14 (200th Street) are the most heavily traveled paved roads within the Project Area. Interstate 90 is located approximately 3.5 miles south of the Project Area and State Highway 266 is located about 1.5 miles east of the northeast corner of the Project Area.

The pre-settlement vegetation within Nobles County consisted of mainly grasslands and wet prairie. Agricultural practices have now converted most of these areas to cultivated cropland, with scattered areas of grasslands (often used for grazing). Natural and semi-natural habitats are very sparse and separated from each other by cropland, power lines, and roads which grid the area. The most recent land cover survey of the area (1990) concluded that nearly 90% of the land within the Project Area was cultivated. Based on a review of aerial photographs, the United States Geological Survey (USGS) map, and a field review, the existing vegetation within the site appears to be generally consistent with the 1990 assessment, with the exception of one 33-acre parcel of Conservation Reserve Program (CRP) grassland which was established since the survey. **Figure 2** and **Table 1** summarize the land cover present within the Project Area.

Table 1. Existing Land Cover

Land Cover	Acres	Percent of Project Area
Row crops/Agricultural	2,760	89.6%
Wooded	22	0.7%
Grasslands	257	8.3%
Wetlands/water	5	0.2%
Farmstead/Rural Residential	36	1.2%
TOTAL:	**3080**	**100%**

Source: Minnesota Land Cover Classification System (1990); Gap Analysis Program (GAP) Stewardship (2008)

The agricultural areas within the Project Area primarily consist of corn and soybeans, with scattered grassy areas used for grazing livestock. Homesteads and farmsteads dot the Project Area and typically include a mowed lawn with a variety of planted trees and shrubs, most of which function as wind breaks or visual screening. The Project Area has been in agricultural production since at least the late 1930's based on the historic photos. Due to the lack of natural and semi-natural habitats within the Project Area, limited areas are available to provide significant habitat for birds and bats. The areas that are available are generally small and fragmented or utilized for grazing livestock. The largest contiguous area of available grassland habitat is approximately 122 acres and located adjacent to a county ditch. However, it appears that portions of this area may be used for grazing livestock.

As stated above, there are a few wooded areas that when combined together encompass approximately 22 acres, or less than 1%, of the Project Area. The majority of the wooded areas are adjacent to farmsteads and serve as wind breaks. Species in these areas primarily include box elder (*Acer negundo*) and cottonwood (*Populus deltoides*), various evergreen species, and multiple other deciduous species. Some of these areas could provide habitat for birds and foliage-roosting bats.

Most of the wetlands in the Project Area are seasonally flooded and wet meadow type wetlands associated with drainage swales and ditches from the agricultural activities. Most of the wetlands located within the crop fields had minimal native vegetation and were drained. A few of the wetlands surrounding the creeks and ditches had vegetation present that could provide habitat for birds and other wildlife. However, some of these areas had been visibly degraded as a result of grazing livestock. Areas of open water would attract waterfowl; however, there was minimal open water habitat within the Project Area.

Open grassy areas attract upland nesting birds as well as raptors, as these areas provide hunting grounds for prey. Grassy areas encompassed 257 acres, or 8%, of the Project Area. Again, much of the grassy area was located around the creeks and drainage ditches, with a few areas of planted grasslands located throughout the Project Area.

V. Results and Conclusions

Wildlife species typical of this area would be those accustomed to frequent disturbance and human activity. The Project Area is located in an area known for high agricultural use. The majority of the land in the area has been converted to row crops or is used for other agriculturally-related activities (e.g., grazing for livestock), all of which contribute to disturbance. While several Wildlife Management Areas ("WMA") surround the Project Area, the nearest proposed turbine is located over two miles from any of these areas. In addition, all proposed turbines have been sited within agricultural lands (**Figure 2**).

Correspondence with the Minnesota Department of Natural Resources and U.S. Fish and Wildlife Service indicated that there are no documented occurrences of State or Federal threatened, endangered, or special concern avian or bat species or their habitats within the Project Area (**Appendix B**). During the July 2011 site visit, no State or Federal threatened, endangered, or species of special concern were encountered. Additionally, there was little evidence of habitat that could support threatened, endangered, or sensitive species within the Project Area.

The Project is located within the Mississippi Flyway of the United States. Avian species present may be permanent or seasonal residents of the area, utilizing the area for breeding and nesting or stopping to rest during migration between breeding and wintering grounds. The Minnesota Ornithologists Union has compiled a list of species for Nobles County based on previous records and observations. According to this list, 271 species of birds have been recorded within Nobles County. While this list represents the majority of species that may be present within the Project Area it should not be considered comprehensive as other

species could potentially occur within the Project Area. Additionally, because the list is partially based on observations, some of these sightings include causal or accidental sightings of species which have wandered from their normal range.

A windshield survey of the available habitat and avian species present within the Project Area was conducted on July 26, 2011. Fifteen species of birds were identified within the Project Area as outlined in **Table 2**.

Table 2: List of Birds Identified During July 2011 Windshield Survey

Common Name	**Scientific Name**
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
Barn swallow	*Hirundo rustica*
Common grackle	*Quiscalus quiscula*
Northern harrier	*Circus cyaneus*
Killdeer	*Charadrius vociferus*
Mourning dove	*Zenaida macroura*
Ovenbird	*Seiurus aurocapilla*
Purple martin	*Progne subis*
Red-winged blackbird	*Agelaius phoeniceus*
Ring-necked pheasant	*Phasianus colchicus*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Sparrows	3 various species

Although one northern harrier was observed, no raptor nests were observed within the Project Area during the site visit. There was little habitat present for waterfowl or waterbirds (e.g., heron), although this does not preclude their existence.

Based on a review of the site conditions and the DNR's list of Mammals in Minnesota, the species of bat with the most likely potential to utilize the habitat available in the Project Area are shown in **Table 3** below:

Table 3: List of Bats Potentially Within Project Area

Little brown myotis	*Myotis lucifugus*
Big brown bat	*Eptesicus fuscus*
Silver-haired bat	*Lasionycteris noctivagans*
Eastern red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*

Source: Department of Natural Resources (2011)

Of these, the little brown myotis and big brown bat are species that are known to roost in caves, mines, and hollow trees in the summer and hibernate throughout the winter. The silver-haired bat, eastern red bat, and hoary bat are all foliage-dwelling bats and migrate south during the winter months. Based on the July 26, 2011 site visit, the roosting habitat available to bats appears to be limited. While there were several buildings within the Project Area, few appeared abandoned. In addition, woodland within the Project Area was mostly

confined to the planted windbreaks surrounding farmsteads. Nevertheless, the limited amount of habitat available does not rule out the presence of bats in the Project Area.

To assist in assessing the potential impact the Project would have on avian and bat populations, related studies with similar land cover in Minnesota (Buffalo Ridge) and Iowa (Top of Iowa) were reviewed. There are similarities and differences between the Community Wind South, LLC Wind Farm area and the Buffalo Ridge and Top of Iowa areas.

The Buffalo Ridge area has significant tracts of cropland with areas of Conservation Reserve Program fields containing planted grasslands. This is similar to the Project Area in that there are significant cropland areas with some planted grassland areas. Due to this similarity in habitat, similar populations of birds and bats could be expected. Several studies have been conducted on the Buffalo Ridge wind farms. Avian mortality reported in these studies ranged from 0.98 - 4.45 birds per turbine per year. Bat mortality ranged from 0.07 - 2.16 bat per turbine per year. Other avian-related studies showed that grassland nesting birds avoided nesting in grasslands within 80 meters of turbines. In general, the authors of each study concluded that the Buffalo Ridge wind farms had little effect on avian and bat populations. Due to the similarities in habitat and avian and bat populations, similar mortality rates could be anticipated with the Community Wind South Project.

The Top of Iowa (TOI) area is also similar to the Community Wind South Project Area in that they both contain large tracts of cropland. However, the TOI wind farm is surrounded by three large (1,000 to 2,500 acres) Wildlife Management Areas (WMA's). While there are several WMAs located within five miles of the Project Area, most are small (less than 100 acres) and fragmented from each other in the landscape. The closest is Bluebird WMA (77.5 acres) which is located approximately 1.5 miles southeast of the Project and over two miles from any proposed turbine. The lower unit of Groth WMA (73 acres) and Van Drie WMA (82 acres) are both located approximately three miles from the Project Area. The largest WMA near the Project is Herlein-Boote WMA. Herlein-Boote is located approximately 4.5 miles southeast of the Project and encompasses about 560 acres. Also, the TOI wind farm was surrounded by large complexes of waterbird (e.g., heron) habitat. Very little of this habitat exists in or near the Community Wind South Project Area. Because of the difference in surrounding habitat, it is anticipated that there would be fewer bird and bat populations in the Project Area than in the TOI Project Area.

From this review, we conclude that the Community Wind South Project Area has minimal suitable habitat for avian and bat species that would be impacted by wind turbines. There are a limited amounts of small, wooded areas adjacent to farmsteads and some open grassy areas, but in general these grassy areas are small, fragmented, or degraded by agricultural activities. Overall, the areas of potential habitat account for a fractional percentage of the total land cover. Therefore, it is our opinion that based on available habitat, there would be, at the most, similar bird and bat fatalities at the Project Area as compared to the Buffalo Ridge and TOI areas.

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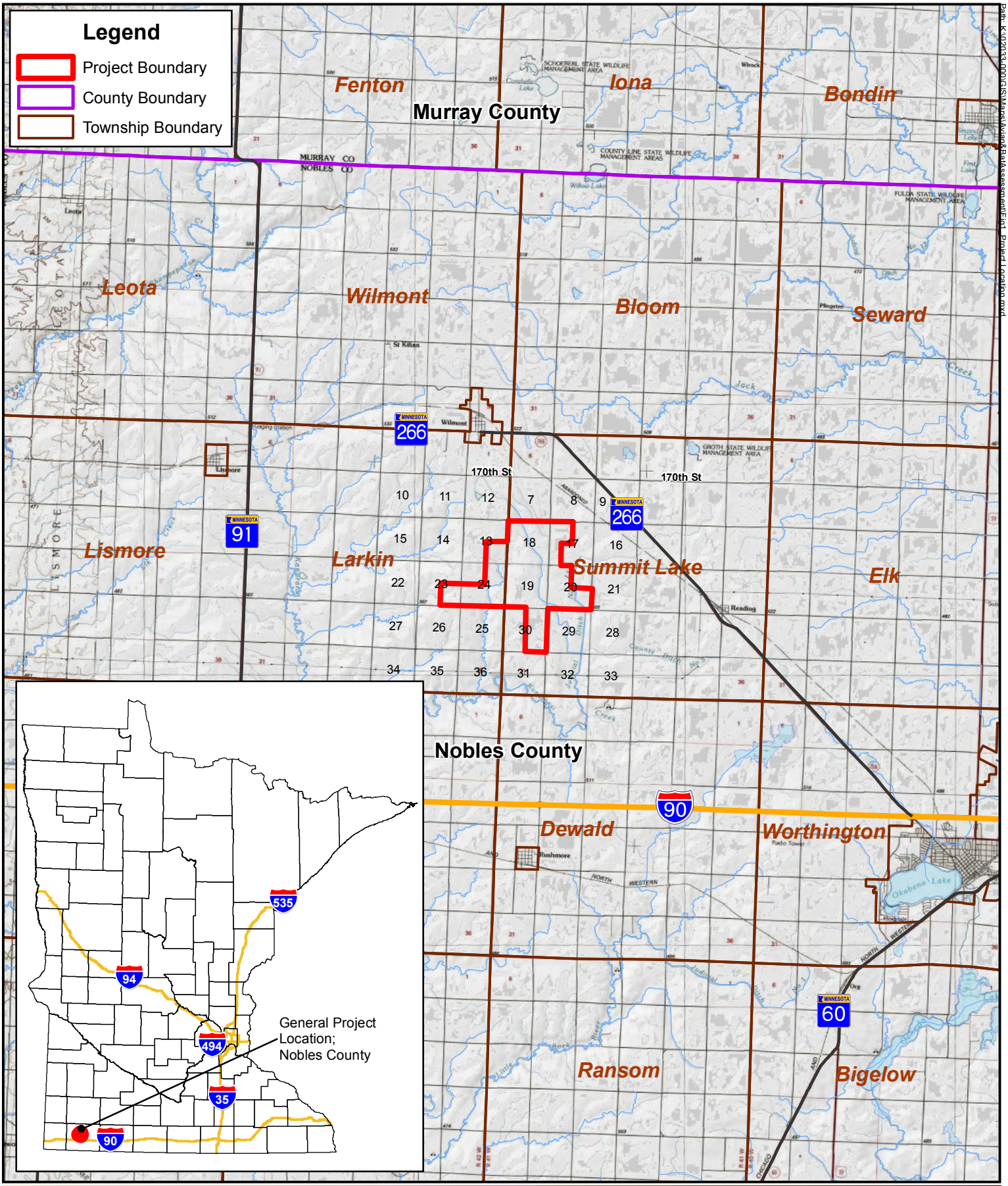
US Fish and Wildlife Service. Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines.

Appendix A
Figures



Community Wind South, LLC

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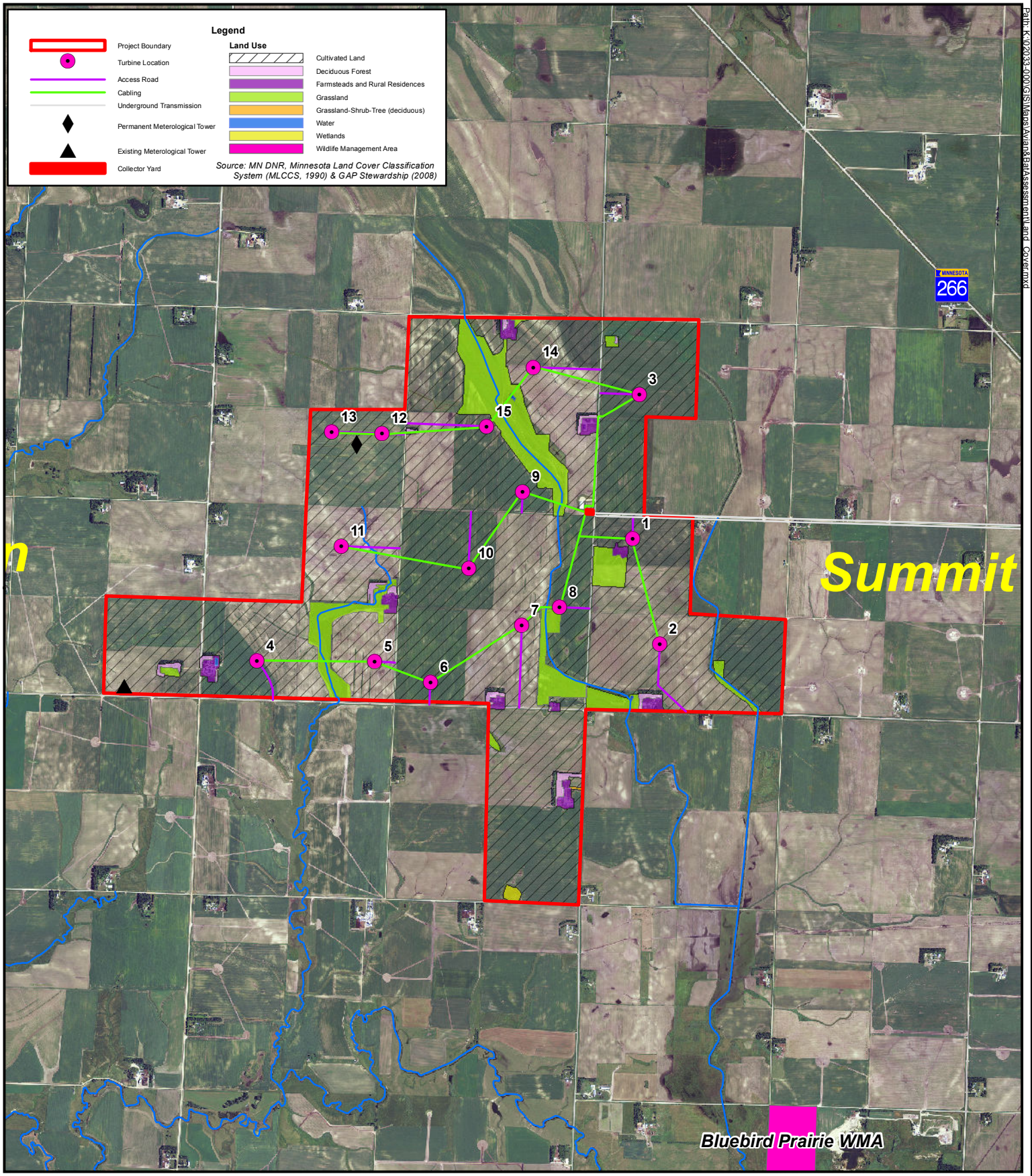
Figure 1: Project Location

NOBLES COUNTY, MN



Path: K:\92033-000\GIS\Maps\Avian&BatAssessment\Land_Cover.mxd

Community Wind South, LLC

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Figure 2: Land Cover

NOBLES COUNTY, MN

Appendix B
Agency Correspondance

WSB & Associates, Inc.

Engineering ■ Planning ■ Environmental ■ Construction

701 Xenia Avenue South
Suite 300
Minneapolis, MN 55416
Tel: 763-541-4800
Fax: 763-541-1700

August 5, 2011

Mr. Steve Colvin- Twin Cities Field Office E.S.
Environmental Review Unit
500 Lafayette Road
St. Paul, MN 55155-4025

Re: Community Wind South LWECS
WSB Project No. 2033-000

Dear Mr. Colvin:

On behalf of Community Wind South, LLC, we are completing the necessary environmental review for the proposed Community Wind South Large Wind Energy Conversion System. The Project is located in central Nobles County, approximately two miles south of Wilmont, Minnesota (see attached map). As part of the planning phase of the Project, we are collecting information that may be available from the Department of Natural Resources regarding wildlife, habitat, wetlands, or flooding for this project. The proposed Project involves the construction of 15 REPower 2.0 MW wind turbines with rotor diameters of 92.5 meters and a hub height of either 80 or 100 meters and with a nameplate capacity of 30 megawatts. Attached are a project location map (**Figure 1**) and preliminary turbine layout (**Figure 2**). Please advise us if there is any information, requirements, or site issues that we should be aware of.

Please mail, email, or call me with any information or questions you may have at 763-231-4847 or aharwood@wsbeng.com

Sincerely,

WSB & Associates, Inc.

Alison Harwood
Environmental Scientist

Attachments

cc: Kevin Mixon, Department of Natural Resources
Tom Kresko, Department of Natural Resources
Mark Willers, Minwind, LLC

Minnesota Department of Natural Resources

Southern Region • 261 Highway 15 South • New Ulm, MN • 56073

Phone: (507) 359-6073 Fax: (507) 359-6018 E-mail: kevin.mixon@state.mn.us

Minnesota DEPARTMENT OF NATURAL RESOURCES

August 31, 2011

RECEIVED SEP 1 2011 WSB & ASSOCIATES

Mrs. Alison Harwood
WSB & Associates, Inc.
701 Xenia Avenue South
Suite 300
Minneapolis, MN 55416

In re: Community Wind South LWECS
Preliminary Review
Nobles County, MN

Dear Alison:

The Minnesota Department of Natural Resources (DNR) has received information concerning the above referenced wind project located in Nobles County, MN. The DNR is providing the following comments as a mechanism to collaboratively work together to identify potential natural resource issues that should be considered during project development.

The DNR considers the project area to be low risk for impacts to birds or bats due to the lack of high value natural resources in the area. As such, the DNR is not recommending any pre-construction wildlife surveys at this time. The DNR may reconsider this position if the project area changes or if new information concerning the presence of wildlife becomes available during project planning or development.

Conservation Reserve Program (CRP) properties are located within the project boundary. Contact the Farm Service Agency located in the county(s) where the project is occurring to coordinate the locations and potential issues concerning these properties (http://www.fsa.usda.gov/FSA/stateoffapp?mystate=mn&area=home&subject=landing&topic=landing). The DNR encourages the placement of turbines outside of CRP properties. Coordination should also occur with the USFWS concerning any conservation easements that are under their jurisdiction.

Project developers crossing (over, under, or across) any state land or public water with any utility (power lines, including feeder lines) need to secure a DNR license to cross (Minnesota Statue 84.415). Information on how to obtain a License for Utility can be found at http://www.dnr.state.mn.us/permits/utility_crossing/index.html. For information on where the Public Waters are located in your project area go to the following site and click on the Public Waters Inventory (PWI) Maps Download button: http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/download.html.

The Draft United States Fish & Wildlife Service (USFWS) Land-Based Wind Energy Guidelines are currently under review by the Secretary of Interior. The wind industry will be encouraged to review and consider the Draft USFWS Guidelines during project development. The Draft USFWS Guidelines can be viewed at: http://www.fws.gov/windenergy/docs/Final_Wind_Energy_Guidelines_2_8_11_CLEAN.pdf.

The DNR looks forward to working in a positive and collaborative manner on this project to ensure that sustainable energy sources are developed while protecting Minnesota's natural resources. Please contact me directly at 507-359-6073 if you have any questions.

Very truly yours,

Kevin Mixon

Kevin Mixon
Regional Environmental Assessment Ecologist
Division of Ecological and Water Resources

Cc: Lisa Joyal, DNR
Jamie Schrenzel, DNR
Skip Wright, DNR
Wendy Krueger, DNR
Bob Hobart, DNR
Karla Ihns, DNR
Lisa Gelvin-Innvaer, DNR
Laurinda Brown, DNR
Rich Davis, USFWS
Deb Pile, EFP
Ingrid Bjorklund, EFP

NO STAPLES PLEASE

For Agency Use Only:						
Received _____	Due _____	RUSH	Inv _____	#Sec _____	Contact Rqsted? _____
Search Radius _____mi.	ER / All	Map'd _____		#EOs _____	Survey Rqsted? _____
NoR / NoF / NoE / Std / Sub	Let _____	Log out _____		#Com _____	
				Related ERDB# _____	

Minnesota DEPARTMENT OF NATURAL RESOURCES

NATURAL HERITAGE INFORMATION SYSTEM (NHIS) DATA REQUEST FORM

Please read the instructions on page 3 before filling out the form. Thank you!

WHO IS REQUESTING THE INFORMATION?

Name and Title: Alison Harwood, Environmental Scientist

Agency/Company: WSB & Associates, Inc

Mailing Address: 701 Xenia Ave South, Suite 300 (Street) Minneapolis (City) MN (State) 55416 (Zip Code)

Phone: 763-231-4847 e-mail: aharwood@wsbeng.com

Responses will be sent via email. If you prefer US Mail check here: ☐

THIS INFORMATION IS BEING REQUESTED FOR A:

☐ Federal EA ☐ State EAW ☐ PUC Site Application ☐ Watershed Plan

☐ Federal EIS ☐ State EIS ☐ Local Government Permit ☐ Research Project

☐ NEPA Checklist ☐ AUAR

☑ Other (describe) LWECS Site Permit

INFORMATION WE NEED FROM YOU:

1) **Enclose a map** of the project boundary/area of interest (topographic maps or aerial photos are preferred).

2) Please **provide a GIS shapefile*** (NAD 83, UTM Zone 15N) of the project boundary/area of interest.

3) List the following locational information* (attach additional sheets if necessary):

For Agency Use: TRS Confirmed ☐

For Agency Use: Region / MCBS Status	County	Township #	Range #	Section(s) (please list **all** sections)
	Nobles	103	41	17, 18, 19, 20, 30
	Nobles	103	42	13, 23, 24

4) Please provide the following information (attach additional sheets if necessary):

Project Name: Community Wind South

Project Proposer: Community Wind, LLC

Description of Project (including types of disturbance anticipated from the project):

The Community Wind South project will involve the installation of 15 REPower 2.0 megawatt wind turbines in Nobles County, Minnestoa. The project will result in a nameplate capacity of 30 megawatts. The project area is 3,080 acres in size and is located approximately 2 miles south of the town of Wilmont, Minnesota. The wind turbines have a 92.5 meter rotor diameter, and the hub height will be either 80 and 100 meters. Each turbine will require an access road for construction activities and post-installation maintenance. High voltage transmission lines will be installed both above and below ground to connect the turbines to a local substation.

* Please see the instructions on page 3.

Describe the existing land use of the project site. What types of land cover/habitat will be impacted by the proposed project? The existing land use is primarily agricultural row crop. Approximately 8% of the project area is grassland, though these areas are highly fragmented and disturbed. Small patches of woodland also exist throughout the project, primarily as windbreaks for homes. Some wetlands occur throughout the project area, but many have been drained to allow farming. Potential impacts are anticipated to occur within the agricultural land.

List any waterbodies (e.g., rivers, intermittent streams, lakes, wetlands) that may be affected by the proposed project, and how they may be impacted (e.g., dewatering, discharge, riverbed disturbance).

Three streams/ditches occur within the project area along with many wetlands. Some of these waterbodies may be impacted by temporary dewatering.

To your knowledge, has the project undergone a previous Natural Heritage review? If so, please list the correspondence #: ERDB # _____. How does this request differ from the previous request (e.g., change in scope, change in boundary, project being revived, project expansion, different phase)?

N/A

To your knowledge, have any native plant community or rare species surveys been conducted within the site? If so, please list: N/A

List any DNR Permits or Licenses that you will be applying for or have already applied for as part of this project:

DNR Public Waters Work Permit, DNR Dewatering Permit, License to Cross Public Lands and Waters

INFORMATION WE PROVIDE TO YOU:

1) The response will include a Natural Heritage letter. If applicable, the letter will discuss potential impacts to rare features.

☐ Check here if this information is being requested for a formal environmental review document (e.g., EAW, EIS) **and** your company/agency has a staff ecologist who will be making the impact determination **and** you do not want DNR staff to provide any interpretation of impacts.

2) The response will also include an Index Report of known aggregation sites and known occurrences of federally and state-listed plants and animals*within an approximate one-mile radius of the project boundary/area of interest.

☑ Check here if you would also like geologic features and rare species with no legal status included in the report.

3) If desired, a Detailed Report that contains more information on each occurrence can be obtained. Please note that the Detailed Report may contain specific location information that is protected under *Minnesota Statutes*, section 84.0872, subd. 2, and, as such, the Detailed Report may not be included in any public document (e.g., an EAW). The Index Report and Natural Heritage letter can be included in any public environmental review document.

☑ Check here if you would also like to receive a Detailed Report.

FEES / TURNAROUND TIME

There is a fee* for this service. Requests generally take **3-4 weeks** from date of receipt to process, and are processed in the order received. Rush requests* are processed in 2 weeks or less if workloads allow, but are not guaranteed.

☑ Check here to RUSH this request. You will be charged an additional $50.

I have read the entire form, and the information supplied above is complete and accurate. I understand that material supplied to me from the Minnesota Natural Heritage Information System is copyrighted and that I am not permitted to reproduce or publish any of this copyrighted material without prior written permission from the Minnesota DNR. Further, if permission to publish is given, I understand that I must credit the Minnesota Division of Ecological Resources, Minnesota Department of Natural Resources, as the source of the material.

Signature (**required**)	Note: Digital signatures representing the name of a person shall be sufficient to show that such person has signed this document.

Mail or email completed form to:
Lisa Joyal, Natural Heritage Review Coordinator
Division of Ecological Resources
Minnesota Department of Natural Resources
500 Lafayette Road, Box 25
St. Paul, Minnesota 55155
lisa.joyal@state.mn.us

Form is available at
http://files.dnr.state.mn.us/eco/nhnrp/nhis_data_request.pdf

Revised July 2009

* Please see the instructions on page 3.

Minnesota Department of Natural Resources
Division of Ecological and Water Resources, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-4025
Phone: (651) 259-5109 E-mail: lisa.joyal@state.mn.us

September 23, 2011 **Correspondence # ERDB 20120036**

Ms. Alison Harwood
WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416

RE: Natural Heritage Review of the proposed Community Wind South;
T103N R41W Sections 17-20 & 30 and T103N R42W Sections 13, 23, & 24; Nobles County

Dear Ms. Harwood,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, see the enclosed database reports; please visit the Rare Species Guide at http://www.dnr.state.mn.us/rsg/index.html for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following **rare features *may* be adversely affected** by the proposed project:

- The creeks within the project boundary flow into waters that are federally designated as critical habitat for the Topeka shiner (*Notropis topeka*), a federally-listed endangered and state-listed special concern fish species. Topeka shiners are adversely impacted by actions that alter stream hydrology or decrease water quality. To minimize potential impacts, please see the enclosed recommendations for working in Topeka shiner habitat. Given the federal status of this species, I also recommend that you coordinate with the U.S. Fish & Wildlife Service's Twin Cities Field Office (612-725-3548) regarding this project.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area.

The enclosed results include an Index Report and a Detailed Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location information, which might result in the destruction of a rare feature, both reports are copyrighted.

The Index Report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index report for any other purpose, please contact me to request written permission. **The Detailed Report is for your personal use only as it may include specific location information that is considered nonpublic data**

under *Minnesota Statutes*, section 84.0872, subd. 2. If you wish to reprint or publish the Detailed Report for any purpose, please contact me to request written permission.

For environmental review purposes, the Natural Heritage letter and database reports are valid for one year; they are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or if an updated review is needed.

Please note that locations of the gray wolf (*Canis lupus*), federally-listed as threatened and state-listed as special concern, and the Canada lynx (*Lynx canadensis*), federally-listed as threatened, are not currently tracked in the NHIS. As such, the Natural Heritage Review does not address these species.

Furthermore, the Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For these concerns, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

Lisa Joyal

Lisa Joyal
Natural Heritage Review Coordinator

enc. Rare Features Database: Index Report
Rare Features Database: Detailed Report
Rare Features Database Reports: An Explanation of Fields
Topeka Shiner Guidelines

cc: Kevin Mixon
Lisa Gelvin-Innvaer

Printed August 2011
Data valid for one year

Minnesota Natural Heritage Information System
Index Report of records within 1 mile radius of:
ERDB #20120036 - Community Wind South
Multiple TRS
Nobles County

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	State Rank	Global Rank	Last Observed Date	EO ID #
Vertebrate Animal						
Notropis topeka (Topeka Shiner) #93 T103N R42W S35, T102N R42W S1, T102N R42W S2; Nobles County	LE	SPC	S3	G3	1999-09-01	25652
Notropis topeka (Topeka Shiner) #128 T102N R41W S5, T103N R41W S32; Nobles County	LE	SPC	S3	G3	2006-05-25	32037

Records Printed = 2

Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. For plants, taking includes digging or destroying. For animals, taking includes pursuing, capturing, or killing.

Copyright 2011, Division of Ecological and Water Resources, State of Minnesota DNR

Alison Harwood

From: Alison Harwood
Sent: Friday, July 29, 2011 8:44 AM
To: 'Richard_Davis@fws.gov'
Subject: Threatened/Endangered species review
Attachments: FWS_T&E.pdf; Project Location_reduced.pdf

Good morning again,

We are also looking for information pertaining to the Topeka shiner federally-designated critical habitat and whether any of those stream segments are present within the project area.

Thank you, and have a great weekend.

From: Alison Harwood
Sent: Thursday, July 28, 2011 9:41 AM
To: 'Richard_Davis@fws.gov'
Cc: Jed Chesnut
Subject: Threatened/Endangered species review

Good morning Rich,

I am following up on a message Jed Chesnut left for you regarding the proposed 15-turbine wind farm in Nobles county. The site is approximately 2 miles south of Wilmont, MN (see attached project location map). I am emailing to request any threatened/endangered species information for the project area. I used the IPac tool on the FWS website and have attached the results. My understanding is that those are county-wide results and so I also wanted to request the official species list for the project area.

Please feel free to give me a call if you have any questions.

Thanks,

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 American Blvd E.
Bloomington, Minnesota 55425-1665

September 20, 2011

Alison Harwood
Environmental Planner and Natural Resources Scientist
WSB & Associates, Inc
701 Xenia Avenue South, Suite 300
Minneapolis, Minnesota 55416

Re: Community Wind South LWECS, Nobles County, Minnesota
FWS TAILS #32410-2011-0134

Dear Ms. Harwood:

This is in response to your July 28, 2011 request for our review of the proposed Community Wind South LWECS project in Nobles County, Minnesota. The proposed project includes the installation of 15 wind turbines, and associated infrastructure including roads, transmission lines, and staging areas. The macro-siting project boundary sent to our office covers a total area of approximately 3,200 acres located in all or parts of sections 17 - 20 and 30 Township 103 North, Range 41 West and sections 13, 23, and 24 Township 103 North, Range 42 West, Nobles County, Minnesota.

The following comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws.

The Service has been in contact with the Minnesota Department of Natural Resources (MnDNR) as they have developed recommended survey protocols and site evaluations that will satisfy both state and federal wildlife statutes, and this letter describes these measures, in part. We appreciate your early coordination with both the Service and the MnDNR, and recommend continued collaboration on this project to ensure wildlife and habitat issues are fully and appropriately addressed.

The Fish and Wildlife Service supports the development of wind power as an alternative energy source. However, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotor-swept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly,

renewable source of power, development sites with comparatively low bird, bat and other wildlife values would be preferable and would have relatively lower impacts on wildlife.

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally-vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region.

The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to the aquatic resource. If water resources will be impacted, the St. Paul District of the Corps of Engineers should be contacted for possible need of a Section 404 permit.

Federally-listed Threatened, Endangered, and Candidate Species

Because of the potential for wind power projects to impact federally-listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take," similar to any other development project. "Take" incidental to a lawful activity may be authorized through the initiation of formal consultation, if a Federal agency is involved. If a federal agency, federal funding, or a federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take after the project is constructed and operational.

Currently, prairie bush clover (Threatened), western prairie fringed orchid (Threatened), and Topeka shiner (Endangered) are present within Nobles County. Our records do not indicate any records of prairie bush clover, western prairie fringed orchid, or Topeka shiner within or directly adjacent to the proposed macro-siting area. At any point during project planning, construction, or operation should any of the above listed species be identified within the proposed project boundary, or should any other species become listed that may be affect by the proposed project consultation should be reinitiated with the Twin Cities Field Office.

Data available at the time of this review indicates records of the endangered Topeka shiner approximately one mile southeast of the proposed project macro-siting boundary. Designated Critical Habitat for the Topeka shiner is located approximately ¾ of a mile south of the proposed macro-siting boundary. The records of Topeka shiners south of the proposed project occur within and outside of designated Critical Habitat streams.

The Service recommends the following actions be considered for the Community Wind South LWECS Project:

1. Avoid working within stream channels during construction or operation of the project.
    a. If work within stream channels is unavoidable, complete the work when the channel is dry.
    b. Only access stream channels, inundated or dry, with clean, grease and oil free equipment.
    c. Stream channel crossing materials should be free of silts and other fines.
2. Underground cables should be directionally bored under all stream channels in a manner and at a depth that does not disturb the bottom of the stream channel.
3. Best Management Practices (BMPs) should be in place to control soil erosion and stop all sediment prior to discharge into all streams and all grassed waterways.
4. No hazardous materials will be discharged or released, during construction or operation, in a manner that the substance would reach surface waters within or adjacent to the macro-siting areas.

Migratory Birds

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds.

The Service recommends that a raptor nest survey be completed within the proposed project boundary and out to two miles from the macro-siting boundary prior to leaf-out in the spring of the year. This is particularily important in identifying recently constructed bald eagle nests, as the Minnesota DNR's records of eagle nest locations has not been updated since 2007. Monitoring should be conducted to assess the daily movement patterns of any raptors actively nesting within the proposed project site or within two miles of the proposed project site. During the incubation and rearing stage, the location of adult birds should be tracked for at least 4 hours twice per week until consistent activity patterns are established. These monitoring dates will be determined based upon identified species within two miles of the project boundary. Alternate monitoring strategies that assess the degree to which nesting birds utilize the proposed project site will be considered. Information collected will be used to document how frequently the birds enter the proposed project site, assist in identifying foraging areas, and should assist with micro-siting to minimize substantial risks to birds within close proximity to the project site.

If bald or golden eagle use areas, including but not limited to; nesting areas, winter roost areas, and foraging areas, are identified within or in close proximity to the proposed project, or if bald or golden eagles are identified during point count or flight path surveys please contact our office immediately. The presence of bald or golden eagles and data gathered through these survey

efforts will be utilized by our office to provide recommendations to assist the project proponent in reducing potential impacts to bald and golden eagles.

The small prairie streams and adjacent wetlands present within the macro-siting areas are utilized by various migratory bird species as flight pathways as they move through the area. The grasslands and wetlands adjacent to these streams may also serve as important nesting habitat for ground nesting grassland bird species. Stream corridors, riparian habitat, and wetlands are regularly utilized by bats for foraging. Turbine placement directly adjacent to the stream corridor or the wetland/open water complex should be avoided.

The Service recommends that surveys be completed to determine bird species that may be moving through this area during spring and fall migration, and bird species that may be in the area throughout the summer. These surveys will help assess the overall value of the proposed project area to migratory bird species, and it will also assist us in determining the need for post construction monitoring.

The Service's Office of Law Enforcement serves its mission to protect federal trust wildlife species in part by actively monitoring industries known to negatively impact wildlife, and assessing their compliance with Federal law. These industries include oil/gas productions sites, cyanide heap/leach mining operations, industrial waste water sites, and wind power sites. There is no threshold as to the number of birds incidentally killed by wind power sites, or other industry, past which the Service will seek to initiate enforcement action. However, the Service is less likely to prioritize enforcement action against a site operator that is cooperative in seeking and implementing measures to mitigate take of protected wildlife.

Migratory Bird Concentration Areas and Conservation Lands

We recommend that no turbines be located within ¼ mile of Conservation Reserve Program, Wetland Reserve Program, or other similar federally- or state-funded restoration projects.

Service Owned Lands

At this time there are no Service owned refuge lands or Waterfowl Production Areas (WPAs) within the macro-siting area or within 1 mile of the proposed project area. The Service generally recommends a minimum setback distance of a ½ mile from WPAs.

Interim Service Guidelines

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;

2) Rank potential sites by risk to wildlife;

3) Avoid placing turbines in documented locations of federally-listed species;

4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations (i.e., rookeries, leks, refuges, riparian corridors, etc.);

5) Avoid locating turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;

6) Configure turbine arrays to avoid potential avian mortality where feasible. Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;

7) Avoid fragmenting large, contiguous tracts of wildlife habitat;

8) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities;

9) If taller turbines (top of rotor-swept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable. Red lights should not be used, as they appear to attract night-migrating birds at a higher rate than white lights;

10) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

The full text of the guidelines is available at http://www.fws.gov/habitatconservation/wind.pdf. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, and avoiding placing turbines between nearby habitat blocks.
If this proposal is to move forward, we strongly recommend that on-the-ground surveys using radar, infrared, and/or acoustic monitoring be conducted during the peak of spring and fall bird migrations and during the breeding season over a period of several years (consistent with the Service's *Interim Guidelines, op. cit.)* to identify breeding and feeding areas and migration stopover sites. Observations made from greater than ¼ mile of target areas are likely to be insufficient to accurately assess bird use of the landscape, particularly if the observer is moving. Generalized ground research survey protocols, such as those followed in the Waterfowl Breeding Population and Habitat Survey (Smith 1995) and the North American Breeding Bird Survey (Pardieck 2001), among others, often do not accept observations made at greater than ¼ mile

from the observer due in part to high probabilities of missed detections (R. Russell, personal communication). Furthermore, spring and fall raptor migration surveys may be necessary, as will surveys to document movement patterns of bald eagles that may use the project area or surrounding habitat. We request that any on-the-ground survey protocols be consistent with the Service's Interim Guidelines (2003), and be coordinated with this office and with the Minnesota Department of Natural Resources prior to implementation.

Pre-Construction Surveys

The Service recommends that project proponent and their consultants conduct rigorous assessments of bird and bat use of the area before proceeding with project design (i.e., preliminary siting of specific turbines). We strongly recommend development of a protocol for bird/bat surveys at this site, and specific consideration should be given to the potential for occurance of marbled godwit within the proposed project area. We encourage project proponent to maintain consistency with other wind farm survey protocols, thus allowing us to compare results with other wind farm survey data. These comparisons will potentially provide valuable information that can be applied in future wind farm/turbine macro- and micro-siting.

In addition to on-the-ground (point or transect) surveys, the use of mobile, horizontally- and vertically-scanning radar to study the direction, altitude, and numbers of flying animals moving through and within the project area during the fall and spring migration of birds and bats, and the breeding period of birds in the area. We recommend that radar be employed for 24 hours a day, 7 days a week during migration, and at a minimum from dawn to dusk during the breeding period. Radar studies are providing useful information in evaluating bird and bat activity at wind generation sites in Wisconsin, Vermont, Massachusetts and other locations. The use of radar coupled with ground-truthing (surveys) can provide a more complete assessment of bird and bat use of a potential wind project area than point counts or other traditional survey methods alone. Such information could inform project design and minimize potential mortality associated with the project.

We recommend installation of two AnaBat SDI detectors per meterological tower to be used within the project area, and data should be collected from April 15 - November 15, 2012 and 2013. One AnaBat detector should be mounted at 5 meters above ground, and the other should be mounted as close to the rotor-swept area as possible. The AnaBat's sensitivity should be adjusted to detect a calibration tone at 20 meters. AnaBat units must monitor from 0.5 hour before sunset until 0.5 hour after sunrise. This will help to gauge bat activity and to some degree, to determine bat species/guild composition within the project area during spring and fall migration and the maternity season.

Post Construction Surveys

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. Generally the Service recommends that surveys be conducted for a

minimum of three years following construction to assess impacts to birds and bats. The duration of post construction surveys is project specific and will be determined based upon pre construction survey results. We also recommend that the post-construction mortality studies be conducted by an independent third party contractor with expertise in bird/bat mortality monitoring. Results of mortality surveys and other forms of monitoring should be used to adjust operations to reduce mortality if necessary and feasible, as well as improve design and siting of future wind generation facilities. **The Developer or its contractor should provide to this office each year, no later than December 31, copies of annual bird/bat mortality monitoring reports.**

Infrastructure Considerations

Development of transmission infrastructure associated with wind facilities also poses risks to wildlife. These risks include potential avian mortality, particularly electrocution of raptors (hawks, eagles, kites, falcons, and owls), that could occur when they attempt to perch on uninsulated or unguarded power poles. Recently published information about which types of power line poles and associated hardware (e.g., wires, transformers and conductors) pose the greatest danger of electrocution to raptors and what modifications can be made to reduce this threat can be found on the internet at http://www.aplic.org/.

Thank you for the opportunity to provide comments on this proposed project. Please contact me at (612) 725-3548, ext. 2201, or Rich Davis, Fish and Wildlife Biologist, at (612) 725-3548, ext. 2214, if we can be of further assistance.

Sincerely,

Tony Sullins

Tony Sullins
Field Supervisor

cc: Kevin Mixon, MN DNR