Appendix G – Blazing Star Wind Farm 2
Avian and Bat Protection Plan

Blazing Star II Wind Farm: Avian and Bat Protection Plan

LINCOLN COUNTY, MINNESOTA

Submitted to:
Blazing Star II Wind Farm, LLC
7650 Edinborough Way, Suite 725
Edina, MN, 55435

Prepared by:
Western EcoSystems Technology, Inc.
7575 Golden Valley Rd, Suite 350
Golden Valley, Minnesota 55427

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Revision Number	Document Date	Comments	Reviser Initials
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1. INTRODUCTION

1.1 Background

The Blazing Star II Wind Farm (the Project) Avian and Bat Protection Plan (ABPP) provides strategies for mitigating risks to birds and bats during the construction and operation phases of the Project. As part of this Project's due diligence, this ABPP was created as documentation of reasonable and prudent measures instituted to prevent or minimize avian and bat mortality. Specifically, this document describes a program that identifies monitoring and mitigation protocols for impacts to affected species while considering the content of the following:

- Avian and Bat Protection Plan white paper (USFWS 2010);
- Suggested Practices for Avian Protection On Power Lines (APLIC 2006) and Reducing Avian Collisions with Power Lines: The State of the Art (APLIC 2012);
- Raptor Nest Survey Results for the Blazing Star II Wind Farm (WEST 2017);
- Blazing Star II Site Characterization Survey (WEST 2017);
- Blazing Star II Northern Long-eared Bat Acoustic Presence/Absence Surveys (Pickle et al. 2016 and Hyzy et al. 2017)
- Blazing Star II Wetland Use Avian Surveys (WEST 2017)
- Avian and Bat Monitoring Studies at Blazing Star Project (2016)
- Avian Monitoring Studies at the Buffalo Ridge, Minnesota Wind Resource area (Johnson et al. 2000);
- Lakefield Wind Project Avian and Migration Studies (Westwood Professional Services 2010, 2011);
- Bat Interactions with Wind Turbines at the Buffalo Ridge, Minnesota Wind Resource area (Johnson et al. 2000);
- US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (WEG;USFWS 2012);
- USFWS 2016 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2016);
- USFWS Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy (Version 2) (ECPG;USFWS 2013)
- Pre-construction survey reports from the nearby Bitter Root Project (Minnesota Public Utilities Commission Docket Number 08-1448)
- Survey reports from the Prairie Rose Project (Minnesota Public Utilities Commission Docket Number 10-425)
- Summary of publicly available Post-construction Monitoring at Wind Projects Relevant to Minnesota (Poulton 2010 and others).

Several other studies are ongoing at the time of this version of the ABPP. Once the studies are complete, the ABPP will be updated to include the results as well as any avoidance, minimization or mitigation measures that are proposed as a result of the information gathered. These studies include:

- Blazing Star II Avian Use Studies (July 2016 – November 2017)
- Blazing Star II General Bat Acoustic Studies (April 2017 – October 2017)
- Blazing Star II Dakota Skipper and Grassland Bird Assessment (September 2017)

1.2 Purpose

This document has been developed for the Blazing Star II Wind Farm to ensure compliance with the regulatory framework outlined in Section 1.4 of this document. It incorporates recommendations made by the Minnesota Department of Natural Resources (MNDNR). It further provides (1) guidance on mitigating the risks to birds and bats during the construction and operation of the Project, and (2) incorporates a framework for complying with federal and state laws and meeting the proposed conditions of the Project's site permits under consideration by the Minnesota Public Utilities Commission (MPUC). The processes and procedures set forth are designed to ensure:

- Avian and bat fatalities and secondary effects on wildlife are minimized at the Project site;
- Project-related actions comply with federal and state wildlife regulations;
- If wildlife-related conditions are contained in the MPUC site permits, they will be fulfilled;
- Ongoing surveys, monitoring and management efforts are undertaken to avoid and minimize adverse wildlife impacts throughout all phases of the Project;
- Bird and bat injuries and fatalities are effectively documented to provide a basis for ongoing development of avian and bat protection procedures;
- Adequate implementation training is provided to the Construction Contractor and Operations and Maintenance staff;
- Coordination between the Project developers and operators, wildlife agencies, Minnesota Department of Commerce Energy Environmental Review & Analysis (EERA) Staff and the MPUC is effective and continuous.

1.3 Project Description

The Project site comprises approximately 76 square miles located in Lincoln County in southwestern Minnesota (Table 1, Map Exhibit 1). The site is located in cropland, between several existing wind facilities.

The Project will have up to 200 MW of wind energy capacity. Blazing Star II continues to assess its turbine options. Blazing Star II is evaluating wind turbines with rated power outputs ranging from 2.0 MW to 3.5 MW, which would result in the installation of between 57 and 100 wind turbines. For the purposes of this application Blazing Star II has provided an evaluation of turbines that are typical of the environmental impacts that may be associated with turbines in this nameplate range. The Project's above ground facilities will occupy less than one percent of the approximately 48,650-acre Project area.

The Project's permanent facilities will include:

- Wind turbines and related equipment;
- New gravel access roads and improvements to existing roads;
- Underground electrical collection and communication lines;
- Operations and maintenance ("O&M") facility;
- Project substation facility and interconnection facilities;
- Up to 4 permanent meteorological towers (height dependent on the final turbine hub height);
- Sonic or Light Range detecting unit (SoDAR or LiDAR);
- A temporary batch plant and staging/laydown area for construction of the Project.

Table 1 lists the townships, sections, and ranges that are included in the Project area.

Table 1. Project Location in Lincoln County, Minnesota

Township	Range	Sections
110	45	2-10
110	46	1, 2, 11, 12
111	45	3-10, 15-22, 27-35
111	46	1-29, 34-36
111	47	1, 12, 13
112	45	3-10, 16-22, 27-34
112	46	1, 2, 12, 13, 24, 25, 31-36
112	47	36
113	45	16, 20-22, 27-35
113	46	36

1.4 Regulatory Framework

1.4.1 Environmental Law Compliance

Federal, state and local environmental regulations that govern the Project are described below. The Project's intent is to comply with all of these regulations. This document is a guide by which construction and operations staff will be able to determine whether they are in compliance with these regulations. Of

particular note to the Project is the State of Minnesota's Wind Siting Act (Minnesota Statute Chapter 216F), discussed in Section 1.4.2 below. This act provides that the site permit application is the environmental document for the wind farm, with no other environmental document required by state or local governments (i.e., an Environmental Assessment, Environmental Assessment Worksheet or an Environmental Impact Statement). A site permit application to the MPUC under this act is the source of most of the operational conditions and protocol that define standard procedures at the Project. Lincoln County will have oversight of the routing of the Project's transmission line.

1.4.2 State of Minnesota Site Permitting

The Minnesota Wind Siting Act requires that a site permit be issued from the MPUC to build and operate a large wind energy conversion system (LWECS). An LWECS is defined as "any combination of [wind energy conversions system] with a combined nameplate capacity of 5,000 kilowatts or more." According to the Statute, the siting of an LWECS must be compatible with environmental preservation, sustainable development, and the efficient use of resources (Minn. Stat. § 216F.03). Further, the criteria considered by the MPUC in designating LWECS sites must include the impact of the LWECS on humans and the environment (Minn. Stat. § 216F.05).

1.4.3 Endangered Species Act

Federal law protects endangered and threatened species under the Endangered Species Act of 1973 (Public Law 93-205, 87 Statute 884, 16 U.S.C. 1531-1544) (ESA). The ESA is administered by the USFWS and the National Oceanic and the Atmospheric Administration Fisheries Service (NOAAFS). Listed species and their critical habitats are protected under the ESA, which prohibits the take or trade of listed animals; however, there is a mechanism to grant permission for incidental take.

In accordance with Section 7 of the ESA, actions that have a federal nexus, such as involvement of federal land, federal funding or major federal permits, necessitates consultation with the USFWS. The consultation may be either informal or formal depending on the affects determination made by the lead federal agency. If it is determined in the Biological Assessment that the effects are "no affect" or "may affect, not likely to adversely affect" the consultation can be completed informally. If the determination is "may affect," or "likely to adversely affect," then the USFWS will write a Biological Opinion. Neither the Project nor the transmission line involve federal funding, land or major permitting, and therefore, they do not trigger consultation under Section 7. However, in the course of preparing the Wildlife Assessment and Field Studies Interim Report (Kieweg et al. 2013) and this ABPP document, the Project team has worked with USFWS and other wildlife agencies to address concerns; these interactions are discussed in the Wildlife Assessment and Field Studies Interim Report (Kieweg et al. 2013).

Section 9 of the ESA provides protection for rare and migratory wildlife, specifically under three types of species designations: endangered, threatened and candidate. Under the endangered and threatened designations, it is unlawful for anyone to take an endangered listed species. Take includes, but is not limited to, harassing, harming, pursuing, hunting, shooting, wounding, trapping, killing, capturing or collecting protected species within the United States and its territorial seas. Take also extends to threatened species per 50 C.F.R. §§ 17.31 and 17.21. More specifically, harm in the definition of take means

> *…an act which actually kills or injures wildlife [including] habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. (50 C.F.R. 17.3)*

Candidate species are not statutorily protected under the ESA because their listing is hindered by higher-priority listing activities. These species include both animals and plants that carry significant risk factors for the USFWS to deem them as endangered or threatened. One federally threatened bat species occurs in Minnesota - Northern Long-eared Bat (NLEB; *Myotis septentrionalis*). On January 14, 2016, the USFWS posted the final Endangered Species Act 4(d) rule for NLEB in the Federal Register. This rule largely establishes an exemption for development and operation of wind energy facilities from needing to obtain any take coverage for NLEB, unless the project would directly impact a known hibernation or maternity roost site

1.4.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) assigns legal authority to the USFWS to protect migratory birds from takings. These include over 800 species of raptors, diurnal migrants, and passerine migratory birds. The MBTA only regulates direct takings, not habitat modifications.

Incidental take as a result of wind energy development has yet to warrant liability under the MBTA, but other industrial activities (including other energy development sectors) have been recently held liable under this act for incidental take of birds. The level of direct taking by a wind energy facility that would invoke prosecution under the MBTA has not been established. However, there is currently no mechanism to grant permission for incidental takings under the MBTA.

1.4.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 USC 668–668c, as amended) is administered by the USFWS. The BGEPA protects bald and golden eagles, their nests, eggs, and parts (e.g., feathers or talons). The BGEPA states that no person shall take, possess, sell, purchase, barter, offer for sale, transport, export, or import any bald or golden eagle alive or dead, or any part, nest or egg without a valid permit to do so (USFWS, n.d.). The BGEPA also prohibits the take of bald and golden eagles unless pursuant to regulations. Take is defined by the BGEPA as an action "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." Disturb is defined in the BGEPA as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (USFWS, n.d.). In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles were not present. Permits are issued to Native Americans to possess eagle feathers for religious purposes. Salvaged eagle carcasses can be sent to the National Eagle Repository in Colorado where they are redistributed to Native Americans. Although the bald eagle was removed from the Endangered Species List in June 2007, it is still federally protected under the BGEPA and Migratory Bird Treaty Act. In addition, the National Bald Eagle Management Guidelines were published in conjunction with delisting by the USFWS in May 2007 to provide provisions to continue to protect bald eagles from harmful actions and impacts.

In September 2009, the USFWS established rules (50 CFR 22.26 and 22.27) authorizing limited legal take of bald and golden eagles and their nests "when the take is associated with, but not the purpose of, an otherwise

lawful activity, and cannot practicably be avoided." Such authorization is provided in the form of a take permit issued by the USFWS, consistent with the regulatory criteria. As part of the 2009 Eagle Permit Rule (USFWS 2009), thresholds of take were established, under which a regional population of bald eagles, or an Eagle Management Unit (EMU), would maintain stable or increasing eagle populations. Regulations under 50 CFR 22.26 distinguish take that might result from short-term or one-time actions from take that might result from ongoing, long-term actions (programmatic take).

In April 2013, the USFWS issued the ECPG. To assist wind project proponents in meeting the requirements of 50 CFR 22.26, the ECPG outlines a five-stage approach to developing successful ECPs. These five stages are:

1. Initial landscape-scale site assessment;

2. Site-specific surveys and assessment;

3. Fatality prediction;

4. Application of advanced conservation practices (ACPs) that avoid and minimize risk, and application of compensatory mitigation for remaining unavoidable take; and

5. Post-construction monitoring.

These five stages build upon one another and in conjunction are used to predict the annual eagle fatalities using a USFWS-developed model that employs a mix of project-specific and existing information regarding eagle behavior. This five-stage approach allows for development of ACPs, which can be used in the USFWS model to display reduction in predicted eagle fatality rate in addition to identifying a predicted number of unavoidable eagle fatalities. The overall goal of this five-stage approach is to use project-specific information and modeling to develop ACPs to minimize the number of predicted annual eagle fatalities to only those unavoidable impacts and provide compensatory mitigation (if and as required under the Eagle Permit Rule, described below) for the fatalities that cannot be avoided.

On December 9, 2013, the USFWS issued a final rule extending the maximum term for programmatic eagle permits from five to 30 years if wind farms adopt measures to minimize harm to eagles. This rule went into effect on January 8, 2014 (USFWS 2013b). On August 11, 2015, a Federal Court (Northern district of California) set aside the 30-year Eagle Permit Rule, finding that the USFWS failed to show an adequate basis in the record for deciding not to prepare a National Environmental Policy Act (NEPA) document prior to increasing the maximum eagle take permit duration. Until further NEPA analysis occurs, which is currently underway as part of the USFWS' Eagle Rule Revisions and Programmatic Environmental Impact Statement, only a renewable 5-year permit duration will be available.

1.4.6 State Threatened and Endangered Species Laws

Minnesota's Endangered Species Statute (Minnesota Statutes Section 84.0895) requires the MNDNR to adopt rules designating species meeting the statutory definitions of Endangered, Threatened, and Special Concern Species (ETSC). The resulting List of Endangered, Threatened, and Special Concern Species is codified as Minnesota Rules, Chapter 6134. The Endangered Species Statute also authorizes the MNDNR to adopt rules that regulate treatment of species designated as endangered and threatened. These regulations are codified as

Minnesota Rules, Parts 6212.1800 to 6212.2300. MNDNR defines endangered, threatened, and special concern species as follows:

- *Endangered (E)* – a plant or animal species that is threatened with extinction throughout all or a significant portion of its range in Minnesota.

- *Threatened (T)* – a plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in Minnesota.

- *Special Concern (SC)* – species that are not endangered or threatened, but are extremely uncommon in Minnesota, or have unique or highly specific habitat requirements and deserve careful monitoring of their status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

1.4.7 Wind Development Guidance

Guidance, recommendations and regulations regarding wind project development and wildlife impacts are being developed and constantly changing at federal, state and local levels. On March 23, 2012, the USFWS released final WEG to mitigate impacts to wildlife and their habitats related to land-based wind energy facilities (USFWS 2012). The guidelines outline a tiered research approach that includes searches of existing literature and data to identify potential issues of concern, field studies to provide additional data where necessary, and post-construction mortality studies to identify and quantify impacts. This guidance document recommends that wind developers voluntarily adhere to these guidelines and communicate with the USFWS as part of their due diligence process in order to avoid, minimize and mitigate impacts to species protected under the BGEPA and MBTA. In turn, the USFWS will "regard a developer's or operator's adherence to these Guidelines, including communication with the Service, as appropriate means of identifying and implementing reasonable and effective measures to avoid the take of species protected under the MBTA and BGEPA" (USFWS 2012). Previously, the USFWS had published Interim Voluntary Guidelines (USFWS 2003), which outlined recommendations for site and turbine design and operations, and presented a quantitative method for initial site evaluation. The 2003 guidelines were not widely used, and the 2012 guidelines replaced them.

The USFWS guidelines target "species of concern" and "species of habitat fragmentation concern." The guidelines define a species of concern as "For a particular wind energy project, any species which 1) is either a) listed as an endangered, threatened or candidate species under the Endangered Species Act, subject to the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act; b) is designated by law, regulation, or other formal process for protection and/ or management by the relevant agency or other authority; or c) has been shown to be significantly adversely affected by wind energy development, and 2) is determined to be possibly affected by the project" (USFWS 2012). It defines species of habitat fragmentation concern as those, "for which a relevant federal, state, tribal, and/or local agency has found that separation of their habitats into smaller blocks reduces connectivity such that the individuals in the remaining habitat segments may suffer from effects such as decreased survival, reproduction, distribution, or use of the area. Habitat fragmentation from a wind energy project may create significant barriers for such species" (USFWS 2012).

Additional federal involvement in wind energy projects may be triggered through the Clean Water Act (1972), National Historic Preservation Act (1966) and NEPA. The U.S. Army Corps of Engineers (USACE) has permitting authority over proposed impacts to federally protected Waters of the United States, including many wetlands. Wetlands are also protected at the state level by the Minnesota Board of Water and Soil Resources. Cultural resources are protected at the state level by the State Historic Preservation Office (SHPO) in collaboration with the federal Advisory Council on Historic Preservation. Federal permitting through the USACE, USFWS or SHPO may trigger NEPA review of a proposed wind project.

In October 2011, the state developed the Minnesota Department of Natural Resources Guidance for Commercial Wind Energy Projects (MNDNR 2011). The guidance outlines the necessary issues to consider when applying for commercial wind energy permits in Minnesota. Additionally, in June 2014, the state issued the Minnesota Department of Natural Resources & Minnesota Department of Commerce Energy Environmental Review and Analysis Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota. This document outlines the recommended pre- and post-construction surveys for avian and bat species for large-scale wind projects in the state.

1.5 Agency Consultation

Natural Heritage Information System (NHIS) review and records of rare species have been requested during the development of this Project. No response from NHIS has been received at the time of this draft of the ABPP; once received, the NHIS response will be incorporated into the next revision of the document.

Additional communications with the MNDNR and the USFWS have included a project coordination meeting held on April 11, 2017, where the Project was introduced and the results of the aerial raptor nest survey were discussed and the proposed avian and bat surveys were discussed.

Copies of communications with agencies can be found in Appendix A.

2. SITE CHARACTERIZATION

As part of this Project, Blazing Star II followed USFWS land-based wind energy guidelines and conducted Tier 1 and Tier 2 site characterization studies, which included analyzing available data in the literature and soliciting information from expert sources. These analyses were used to identify broader environmental and site-development issues. Detailed information from site characterization studies is found in the WEST Site Characterization Survey (2016). Findings and concerns from these studies are summarized briefly below.

2.1 Wildlife and Habitat near the Blazing Star II Project Site

The Blazing Star II Wind Farm is in the Northern Glaciated Plains level III ecoregion and the Prairie Coteau (46k) Level IV ecoregion (USEPA 2015). The Northern Glaciated Plains ecoregion is flat to gently rolling landscape of glacial drift. The region is transitional between tallgrass and shortgrass prairie and high concentrations of temporary and seasonal wetlands offer suitable habitat for waterfowl nesting and migration. The Prairie Coteau is generally a higher elevation plateau with poorly defined drainage. Many lakes and a mix of row crops and pasture are present in this region and the Project itself (Table 1; Figure 2).

Prior to agricultural clearing, the Project site and the surrounding landscape were covered in prairie and wet prairie with oak openings and barrens on fire-protected uplands, and river bottom forest along protected

waterways (Marschner 1974). The most recent glacial period left the region pocked with small wetlands and kettlehole lakes.

According to 2011 U.S. Geological Survey (USGS) National Land Cover Database (NLCD), land cover within the Project is primarily a mosaic of cultivated crops (65.7%), herbaceous grassland (11%), and hay/pasture (10.5%). Together these three land cover types account for approximately 87% of the Project area. Other substantial land cover types within the Project include developed open space, mostly in the form of roads, which accounts for approximately 5.2% of the Project, emergent herbaceous wetlands (4.5%), and open water (2.5%). The remaining land cover types within the Project (deciduous forest, woody wetlands, shrub/scrub, and barren land) each comprise less than 1% of the Project. Remaining natural lands are highly fragmented and generally associated with the region's water features. Near the site these water features include the Lac qui Parle River and Yellow Medicine River, which flow through the site. Within the cropland complex small natural patches include grasslands along drainage ditches, fence rows, and woodlots and wind breaks associated with farmsteads. The Minnesota Biological Survey and MNDNR have designated several areas within the Project as native plant communities or sites of biodiversity significance.

Natural and restored areas are protected by ownership or through the use of USFWS, NRCS, or state conservation easements. The largest protected area within the site is the Iron Horse Wildlife Management Area (WMA) complex in the central part of the Project. Other WMA units within or adjacent to the Project include Bossuyt WMA, Ten Sloughs WMA, Pothole WMA, Christine WMA, Ivanhoe WMA, Blue Wing WMA, Anderson Lake WMA, Shaokatan WMA, Chain-O-Sloughs WMA, Ash Lake WMA, Herschberger WMA, Emerald WMA, Muskrat Junction WMA, Emerald WMA, Horse Slough WMA, and Weeks WMA. Easements within the Project include USFWS Waterfowl Production Areas (WPAs), MN DNR designated native plant communities, Minnesota Biological Survey-identified Sites of Biodiversity Significance, Reinvest in Minnesota (RIM) conservation easements and numerous parcels with easements through the MN Board of Water and Soil Resources including Permanent Wetland Preserve, Marginal Cropland – Perpetual Easement, and Conservation Reserve Enhancement Program (CREP). A small fraction of the area is developed. Ivanhoe, located less than a mile east of the site, is the largest nearby community. Most development within the site is found at individual farmsteads. Habitat cover at the site follows these general patterns, and a more detailed discussion of land cover at the site can be found in Section 2.2.

In the early 1800s, the county's abundant wildlife included large herds of Bison (*Bison bison*) and American Elk (*Cervus canadensis*). The numerous wetlands provided habitat for large numbers of waterfowl and waterbirds, including Trumpeter Swan (*Cygnus canadensis*), Canada Goose (*Branta canadensis*), Mallard (*Anas platyrhynchos*), Northern Pintail (*Anas acuta*), Canvasback (*Aythya valisineria*), Blue-winged Teal (*Anas discors*), Gadwall (*Anas strepera*), Redhead (*Aythya americana*), Northern Shoveler (*Anas clypeata*), Wilson's Snipe (*Gallinago delicata*), American Bittern (*Botaurus lentiginosus*), Sora (*Porzana carolina*), Virginia Rail (*Rallus limicola*) and Western Grebe (*Aechmophorus occidentalis*). In upland grassland, birds such as Marbled Godwit (*Limosa fedoa*), Upland Sandpiper (*Bartramia longicauda*), Bobolink (*Dolichonyx oryzivorus*), Western Meadowlark (*Sturnella neglecta*), and Greater Prairie Chicken (*Tympanuchus cupido*) thrived (MNDNR 2006).

With the plowing of the prairie and the draining of wetlands, the large herds of ungulates were eliminated and many of the other formerly conspicuous wildlife are now rare. There are 78 Species in Greatest Conservation Need (SGCN) that are known or predicted to occur in the subsection, which represent 27% of the SGCN species identified for the state (MNDNR 2006). These are species that are rare, declining, or vulnerable, or

dependent upon habitats that are rare, declining or vulnerable. Habitat loss and degradation is a problem for nearly 90% of SGCN identified for the subsection (MNDNR 2006). To persist, these rare species generally require extensive habitat, many large habitat patches near each other, or high quality habitat. While extensive and/or high quality habitat is generally lacking from the Project, protected areas do provide potential habitat for some of these SGCN species.

In general, however, the wildlife encountered near the Project site is adapted to agriculture and development. Commonly encountered wildlife species include White-tailed Deer (*Odocoileus virginianus*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Mallard (*Anas platyrhynchos*), Canada Goose (*Branta canadensis*), Red-winged Blackbird (*Agelaius phoeniceus*), Common Grackle (*Quiscalus quisculua*), Common Crow (*Corvus brachyrhynchos*), American Robin (*Turdus migratorius*),the introduced House Sparrow (*Passer domesticus*), House Finch (*Carpodacus mexicanus*), Rock Pigeon (*Columa livia*), Ring-necked Pheasant (*Phasianus colchicus*), and European Starling (*Sturnus vulgaris*). The agricultural landscape and developments of the region have determined the type of wildlife present, supporting chiefly those that can adapt to intensive human land use.

2.2 Habitats and Landcover within the Blazing Star II Project

The 2011 U.S. Geological Survey (USGS) National Land Cover Database (NLCD) land cover map was used for a habitat-by-habitat assessment of collision and habitat displacement risk. A habitat cover map was created to define and visualize the locations where different bird and bat habitats were present. Habitat cover types are summarized in Table 2.

Table 2. Landcover types within the Blazing Star II Wind Energy Project.

Land Classification (combined NLCD data)	Area (acres)	Percent of Total
Cultivated Crops	31,960.1	65.7
Herbaceous	5,339.7	11.0
Hay/Pasture	5,089.0	10.5
Developed, Classes Merged	2,538.9	5.2
Emergent Herbaceous Wetlands	2,201.0	4.5
Open Water	1,215.5	2.5
Deciduous Forest	280.2	0.6
Woody Wetlands	20.0	0.0
Shrub/Scrub	5.6	0.0
Barren Land	2.4	0.0
Total	**48,652.5**	**100.0**

The Minnesota Biological Survey identified areas of biodiversity (High, Moderate, Below) within Lincoln County; some of those areas fall within the Project boundary. Many of these areas are associated with state and federally owned and managed lands. 4,075 acres (8.3% of Project boundary) are ranked as "below," and 3,287 acres (6.8% of Project boundary) are ranked as "moderate;" there are no sites of "high" or "outstanding" biodiversity significance in the Project boundary. The areas ranked as "moderate" are mostly located within state managed lands, including Iron Horse WMA, Shaokatan WMA, Herschberger WMA, and Ash Lake WMA; several other areas of mapped moderate biodiversity are associated with riparian areas in the central and northern portions of the Project.

Approximately 5.2% of the site is developed, consisting primarily of roads and farmsteads. Most of the farmsteads have windbreaks and wood lots with mature trees. Ivanhoe is located outside the eastern boundary the site Hendricks is located approximately five miles west of the site, , and Arco is located approximately 3 miles to the southeast of the site.

2.3 Endangered, Threatened, Special Concern and SGCN Species

The USFWS county distribution list, and MNDNR county distribution list identified the potential for Topeka shiner (*Notropis topeka*, Federal endangered), Poweshiek skipperling (*Oarisma poweshiek*, Federal endangered), Western prairie fringed orchid (*Platanthera praeclara*, Federal threatened), NLEB (federal threatened), Dakota skipper (*Hesperia dacotae*, Federal threatened), Henslow's sparrow (*Ammodramus henslowii*, state endangered), loggerhead shrike (*Lanius ludovicianus*, state endangered), Ottoe skipper (*Hesperia ottoe*, state endangered), Blanding's turtle (*Emydoidea blandingii*, state threatened), Hair-like beak rush(*Rhynchospora capillacea*, state threatened) within the county. Of these, the Topeka shiner is not anticipated to occur in this part of Lincoln County because the Project is located in the Minnesota River Basin, where the shiner does not occur.

The MNDNR maintains an NHIS database through their Natural Heritage Program and Nongame Game Research Program, which is the most complete source of data on Minnesota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other rare natural features (MNDNR, 2016). NHIS data show that there is one state-listed species record within the Project boundary – the endangered loggerhead shrike. There are also records of two plant species of special concern within the Project boundary (Slender milk-vetch [*Astragalus flexuosus var. flexuosus*] and western white prairie-clover [*Dalea candida var. oligophylla*]). There are documented occurrences of one bird (Henslow's sparrow, *Ammodramus henslowii*), one insect (Poweshiek skipperling), and one plant (hair-like beak rush, *Rhynchospora capillacea*) within 5 miles of the Project boundary that are state-listed endangered or threatened. In addition, 15 species of special concern (4 birds, 1 insect, 3 mammals, and 7 plants) and one bird species that does not have a legal status, but is being tracked by the MNDNR, have been documented within 5 miles of the Project boundary.

WEST identified the presence of habitat for protected or sensitive species during the Tier 2 site visit and Tier 3 studies, including wetlands, grasslands, prairie, depressions, and other habitats utilized by ETSC, SGCN, or concentration areas used by species covered by the federal MBTA. Many of these lands are within or near WMAs and WPAs that are within, adjacent, or in proximity to the Project. Turbines will be sited outside of these lands, using the 5 rotor diameter (RD) x 3 RD setback from non-leased lands as a minimum setback.

Blazing Star II is coordinating with wildlife agencies, conducting surveys and identifying avian flight paths within and around the site (described in Field Studies). Once the results of these studies are analyzed, flight paths and other information will be used to inform the site layout as it is finalized.

2.4 Tier 1 and Tier 2 Questions

As described in the Final Land-based Wind Energy Guidelines (USFWS 2012), Tier 1 studies help to identify potential issues that may need to be addressed before further actions can be taken with the development or operations of a Project. The objective of the Tier 1 & 2 study is to assist the developer in further identifying a potential wind site by providing a preliminary evaluation or screening of public data from federal, state, and tribal entities and offering early guidance about the sensitivity of the site in regards to flora and fauna. The following discussion provides answers to the Tier 1 and 2 questions for the Blazing Star II Project.

1. *Are there species of concern, or habitat for that species, present in the proposed Project area?*

There are several areas designated by the Minnesota Biological Survey as native plant communities within the Project which may provide suitable habitat for listed species such as the Dakota skipper and Ottoe skipper. Some of these native plant communities overlap areas designated as sites of moderate biodiversity significance by the MN DNR. These areas, along with freshwater emergent wetlands, perennial streams, and open water bodies may provide suitable habitat for some of the species listed in Section 2.3. The Project may pose some risk to Northern long-eared bats as they migrate across the landscape from summer foraging and roosting habitats to swarming areas near hibernacula. The general lack of forested areas likely to function as suitable habitat for Northern long-eared bats within the Project suggests that it is not likely to present risk to Northern long-eared bats during the summer maternity period – Tier 3 studies focused on Northern long-eared bats are summarized in Section 3.2

2. *Does the landscape contain areas where development is precluded by law or designated as sensitive according to scientifically credible information?*

There are several protected areas within the Project including several state WMAs, WPAs and privately owned conservation areas (Figure 5).

3. *Are there plant communities of concern present or likely to be present at the site?*

There are several native plant communities and sites of moderate biodiversity significance designated by the MN DNR within the Project (Figure 6). Within the Project boundary, 7,362 acres have been identified by the MBS as various levels of Sites of Biodiversity. Of these, 4,075 acres (8.3% of Project boundary) are ranked as "below," and 3,287 acres (6.8% of Project boundary) are ranked as "moderate;" there are no sites of "high" or "outstanding" biodiversity significance in the Project boundary. There are also 430 acres of MBS-mapped native plant communities in the Project boundary, all of which are associated with sites identified as moderate biodiversity. Of the identified native plant communities, 359 acres are mapped as dry hill prairie, 35 acres are mapped as prairie meadow, 17 acres are mapped as basswood-bur oak forest, 17 acres are mapped as dry sand-gravel prairie, 5 acres are mapped as mesic prairie, 3 acres are mapped as wet prairie, and less than 1 acre is mapped as spikerush-bur reed marsh. Proper siting of turbines and infrastructure to avoid these areas, particularly the moderate biodiversity sites, should minimize the potential impacts to plant communities of concern.

4. *Are there known critical areas of wildlife congregation in the proposed Project area?*

There is some potential for species of wildlife to congregate within the Project area based on publicly available data, specifically within the state wildlife management areas present within the project or in and

around lakes and other open waterbodies during peaks in avian migration through the area. However, the site visit and initial studies conducted to date have not identified rookeries or communal avian roosting spots.

5. *Are there large areas of intact habitat with the potential for fragmentation, with respect to species of habitat fragmentation concern needing large contiguous blocks of habitat?*

A large portion of the Project area is highly fragmented already and a mosaic of cultivated cropland, herbaceous areas, pasture, open water and wetlands comprise the majority of the Project area. NLCD data and aerial imagery indicates that there are relatively large areas of intact mixed herbaceous grasslands and pasture/hay within the Project. The relatively large areas of contiguous grasslands and pastures may be suitable for some sensitive species such as the Henslow's sparrow which require large intact areas of grassland. However, the site visit indicated that most of the grasslands within the Project area that are not within state or federally managed lands are relatively small and fragmented, and of low quality.

6. *Which species of birds and bats, especially those known to be at risk by wind energy facilities, are likely to use the proposed site based on an assessment of site attributes?*

Additional data from field studies would be necessary to adequately address potential presence of species of concern. The Project occurs within the known range of the NLEB, and occurrence is possible within the forested areas of the Project during the summer months as well as more generally during early fall migration throughout the area. Bald and golden eagles may also occur within the Project. Initial studies indicate that there are bald eagle nests outside of, but within two miles of, the Project area; and bald eagles may occur as nesting pairs or as passing migrants within the Project boundary; Tier 3 studies to date indicate relatively higher eagle use in the fall and winter compared to spring and summer in the Project. Golden eagles are much less common in this area and are expected to occur as uncommon migrants passing through in a broad-front fashion. In the Tier 3 studies to date, one golden eagle was documented at one survey point during spring 2017. Additionally, species that utilize prairie, wetland and grassland areas may find suitable habitat in the larger blocks of herbaceous grassland, wetland complexes and pasture that are present within the Project.

7. *Is there a potential for significant adverse impacts to species of concern based on the answers to the questions above?*

Based on available information the potential for significant adverse impacts to species of concern from development of the Project is relatively low. There are no critical habitat areas within the Project and the landscape and habitat features present within the Project are similar to those in the surrounding landscape. Habitats within the Project are already largely fragmented.

3. FIELD STUDIES

Blazing Star II contracted with WEST to conduct USFWS Tier 3 field studies beginning in the summer of 2016 to obtain additional data on birds, bats, native prairies, and protected species' habitats. Tier 3 field studies will continue through the fourth quarter of 2017 and a final report will analyze data from all surveys. These activities serve to inform the Project Owner of the types and extent of wildlife present within and adjacent to the Project. Survey results will also inform Project infrastructure siting, as well as the extent of ongoing surveys to comply with regulatory programs such as the ESA, MBTA, and BGEPA.

Avian SC, SGCN or eagle species (no ETSC species have been seen) observed through June 30, 2017 during Tier 3 surveys include:

- American white pelican (SC, SGCN)

- Bald eagle (SGCN; BGEPA)
- American kestrel (SGCN)
- Belted kingfisher (SGCN)
- Black tern (SGCN)
- Common merganser (SGCN)
- Dickcissel (SGCN)
- Franklin's gull (SC, SGCN)
- Golden Eagle (BGEPA)
- Lesser scaup (SGCN)
- Northern harrier (SGCN)
- Northern pintail (SGCN)
- Sedge wren (SGCN)
- Swainson's hawk (SGCN)
- Upland sandpiper (SGCN)
- Western meadowlark (SGCN)
- Yellow-headed blackbird (SGCN)

WEST designed the Tier 3 surveys to describe the distribution and abundance of species in and near the proposed Project site, to understand the relative risk of collision and habitat displacement among habitat types, and to enable decisions to use or avoid different areas in the site. Overall, over 300 hours of avian surveys will be completed at the site, including those described below.

3.1 Birds

3.1.1 Passerines

Avian Surveys. WEST began avian use surveys in July 2016 (Map Exhibit 1), using point count methodology outlined within the WEG (2012). The objective of the fixed-point avian use surveys is to provide information regarding levels of use by birds, including small birds and large birds (e.g., bald eagles and other large bird species). The fixed-point avian use surveys consist of counts of bird use within circular plots around fixed observation points following methods similar to Reynolds et al. (1980). From July 2016 through April 2017, the following protocol was followed at 20 points in an initial Project boundary. During the first 20 minutes of each count, all birds (small and large) were identified and counted. After the first 20 minutes, the survey shifted to focus on large birds only (described in section 3.1.2 Raptors).

In May 2017, WEST modified the survey approach. The larger 48,640-acre Project area required adding additional survey points and dropping several of the original survey point locations to provide up to 30% coverage of the area falling within the new Project area. Second, in order to follow the survey protocol

recommendations as codified in the December 16, 2016 Eagle Rule, WEST changed the protocol at the survey points. Starting in May, WEST separately surveyed for small birds: i.e., is not overlapping small bird surveys with the one-hour eagle/large bird surveys. Small bird observations are recorded during the first 10 minutes at each survey point. After the 10-minute small bird survey, the survey shifts to a separate one hour survey that focuses only on large birds. The first 20 minutes of this hour records all large birds (focusing attention on any eagles that are observed), with the remaining 40 minutes consisting of eagle-only surveys. Avian surveys will continue through November 2017 at the 25 Project point count locations currently being surveyed.

3.1.2 Raptors

Avian Surveys. Raptor and large bird migration point count surveys began in July 2016, with protocol and point locations being changed in May 2017 as described in Section 3.1.1. Additionally, once the large bird surveys are completed November 2017, one-hour eagle only surveys will be conducted monthly at the 25 points starting in December 2017, which will continue through June 2018.

After these surveys are completed in November 2017, eagle-only surveys will continue at the 25 points once per month from December 2017 through June 2018. This survey approach is consistent with the recommendations included in Appendix C: Stage 2 – Site-Specific Surveys and Assessments in the USFWS's *Eagle Conservation Plan Guidance* (April 2013).

Estimated distance to each raptor observed will be recorded to the nearest five meters. Landmarks will be located to aid in estimating distances to each bird. The date, start, and end time of observation period, plot number, species or best possible identification, number of individuals, sex and age class (if possible), distance from plot center when first observed (m), closest distance (m), height above ground (m), activity, and habitat will be recorded.

Flight or movement paths for eagles will be mapped and given corresponding unique observation numbers. The map will indicate whether the bird was within or outside the survey plot based on reference points at known distances from the plot center. If time allows and it does not distract from eagle observation work during the large bird survey portion of the surveys, the WEST biologist will also record the flight paths of other large birds such as other raptors, cranes, and waterfowl.

Bird behavior and habitat will be recorded for each bird observation. For bald eagle or golden eagle observations, additional behavior and habitat data will be recorded during each one-minute interval the bird is within view, per the USFWS *Eagle Conservation Plan Guidance*. Behavior categories will include soaring flight (SO), flapping-gliding (FL), hunting, kiting-hovering (HU), stooping/diving at prey (ST), stooping or diving in an antagonistic context with other bird species (AG), perched (PE), being mobbed (MOB), undulating/territorial flight (TER), auditory (AUD), and other (noted in comments). The initial flight patterns and habitat types (at first observation) will be uniquely identified on the data sheet and subsequent patterns and habitats will also be recorded. The flight direction of observed birds will also be recorded on the data sheet map. Approximate flight height at first observation will be recorded to the nearest five meters; the approximate lowest and highest flight heights observed will also be recorded. Any comments or unusual observations will be noted in the comments section. Weather information recorded for each survey point will include temperature, wind speed, wind direction, precipitation, and cloud cover.

Plot surveys will be conducted throughout daylight hours. During a set of surveys, each plot will be visited once. A pre-established schedule will be developed prior to the field surveys to ensure that each station is surveyed approximately the same number of times, to spread survey times throughout the day, and to minimize travel time between plots.

Raptor Nest Survey. WEST conducted an aerial raptor nest survey on April 4-8, 2017, the principal objective of which was to document the presence of bald eagle nests within the Project boundary and 10-mile buffer area in compliance with the ECPG, and document the presence of other raptor stick nests within the Project boundary and 1-mile buffer area (WEST 2017). WEST detected a total of 92 raptor nests representing three raptor species. Nine occupied bald eagle nests, fourteen occupied red-tailed hawk (*Buteo jamaicensis*) nests, eleven occupied great-horned owl (*Bubo virginianus*) nest, five occupied and active unknown raptor nests, ten occupied and inactive unknown raptor nests, and forty-three unoccupied and inactive unknown raptor nests were identified. No occupied or potential bald eagle nests were located within the Project.

3.1.3 Waterfowl and Waterbirds

Avian Wetland Use Surveys. WEST began wetland use surveys in April 2017 (Map Exhibit 1), using methodology outlined within the Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota (MNDNR/MNDOC 2014). The objective of the avian wetland use surveys is to provide information regarding levels of use of open water lakes or wetlands by birds, including waterfowl and waterbirds). The avian wetland use surveys consist of counts of bird use of wetlands and maps of any observed flight paths. Surveys were conducted for 60 minutes each, a minimum of 3 times from April 1 through June 30, 2017.

Two-thirds of the 3,898 observations at the Project were of waterfowl, with that group's use split among 18 species; this group was documented at all survey points and had the highest percent frequency of occurrence at 97.2%. Waterbirds were the second-most frequently observed group, being recorded during 55.2% of avian wetland use surveys. While nearly 20% of the large bird observations were of American coots, this number was attributed to just eight groups of relatively large flocks, and this group's frequency of occurrence was therefore relatively low (22.2%). Diurnal raptors made up less than one percent of observations. No state or federally listed species were observed, and no eagles were observed during the avian wetland use surveys. Two species listed as special concern by the DNR were observed: the Franklin's gull and American white pelican.

Overall there was no obvious pattern to spatial use by large birds at the wetland use surveys in the Project. While the highest use point (II-16) was located adjacent to the Shaokatan WMA with large wetland complexes, two other points (II-18 and II-20) located adjacent to WMAs with similar wetland habitat had lower than average mean use. Additionally, Point II-6 recorded relatively high use mostly associated with the adjacent open water at Perch Lake; however, Point II-5 is located adjacent to a similarly sized open waterbody (Steep Bank Lake), and Point II-5 had the lowest mean use of all the surveyed points.

Waterfowl and Waterbird Collision Risk. Because available data suggest that these species are able to see and avoid turbines, the risk to them is expected to be low on the majority of the site (Erickson et al. 2001; NRC 2007). The greatest use (and potentially risk) will occur near WMAs and WPAs, particularly during spring, and risk would also be increased during inclement weather when visibility is poor.

3.1.4 Sensitive Bird Species

Sensitive species are most likely to experience impacts from wind energy development because other existing factors unrelated to wind energy development are already present. In monitoring and analyses, WEST biologists use native species as a broad indicator of wind project impacts and sensitive species as a specific indictor of potential effects to already at-risk species. Sensitive species vary from ecological region to ecological region, based on the abundance and population trends of species.

Sensitive species are similar to the species of concern as defined in the USFWS recommendations (2012a); however, the WEST-defined sensitive species emphasize the conservation significance of a species. For example, mourning dove is protected by the MBTA and some state game laws, but its population is large and at low risk from wind energy development. Consequently, it is a "species of concern" to the USFWS, but not a "sensitive species" in the WEST analysis.

During the surveys completed to date, WEST observed 72 different species of birds at or near the Project site from July 2016 through June 2017. Of these species seen in the survey, 18 species (25%) were classified as sensitive by criteria described above. These species already experience problems unrelated to wind energy development, which raises concern for their conservation.

The natural habitats concentrated in the site's WMAs and WPAs tended to be the most important to sensitive species. Placing turbines in cropland at a distance from these features would present the lowest risk to sensitive bird species. These preliminary conclusions will be reevaluated after all avian and wetland use surveys are completed and the data is analyzed.

3.1.5 Habitat Displacement Risk

The more or less permanent grasslands and pastures on the Project site are possibly important to already at-risk grassland bird species. Wind development can reduce breeding densities of these species through habitat displacement. Some grassland specialist bird species are known or suspected to be susceptible to this effect, perhaps because of their behavioral aversion to trees and other tall structures (Shaffer and Buhl 2016; Strickland et al. 2011). Recent work on a smaller spatial scale documented wind turbine avoidance for several species of concern expected to be in the Project area, including bobolink, grasshopper sparrow, and upland sandpiper, although only the latter has only been observed in the surveys conducted to date (Shaffer and Buhl 2016). Large and clustered grassland habitats should be avoided when siting turbines specifically to avoid the displacement and avoidance risk for grassland species. With respect to waterfowl, most foraging is expected to occur near the protected open water wetlands along the site's northern and western boundaries where the greatest waterfowl activity was observed during the spring migration. However, habituation to turbines is likely to occur, reducing the impact of wind development over time. In addition, thousands of acres of cropland remain within the Project. These preliminary conclusions will be reevaluated after the collection of breeding and fall migration data.

3.2 Bats

3.2.1 Acoustic Monitoring Survey

Blazing Star II contracted with WEST to conducting acoustic surveys within the Project site designed to partially characterize general bat activity levels by season. Bat activity will be surveyed within the Project from April 1 through November 1, 2017. Ground-based (1.5 meter [m]) and raised detectors (45 m) are

paired at one meteorological tower within the Project; and two additional ground units (1.5 m) have been placed within the Project for a total of four detectors (Map Exhibit 2).

Bat activity data will be collected using full spectrum acoustic monitoring and data logging platforms (Song Meter SM3, Wildlife Acoustics, Inc., Concord, MA, USA). Echolocation calls will be classified into two frequency categories, high frequency (HF; > 30 kHz) and low frequency (LF; <30 kHz), and identified to species or species group (*Myotis*) whenever possible. The complete season of data will be analyzed and reported following the end of the survey season.

3.2.2 Northern Long-eared Bat Presence/Absence Surveys

Blazing Star II contracted with WEST to evaluate the potential presence of the federally threatened NLEB at the Project site following the U.S. Fish and Wildlife Service *Northern Long-Eared Bat Interim Conference and Planning Guidance* (USFWS 2014a) and the *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2015b). This evaluation included a review of potential NLEB habitat and acoustic surveys to assess the potential presence of the NLEB within the Project area. The evaluation of potential NLEB habitat involved quantifying the percent cover of woodland habitat types within the Project area and a 2.5-mile buffer zone; and identifying potential foraging, roosting, and commuting habitats – this will include consideration of woodland patches (separated from other habitats by at least 1,000 feet) that are unlikely to be suitable given their isolation. Acoustic surveys were conducted in both 2016 and 2017.

2016

The acoustic surveys were conducted from July 27 – 29, 2016, consistent with USFWS Guidelines. Surveys were conducted at two survey sites (four survey stations), for a total of 8 detector nights, all of which were valid (met weather and other criteria). Bats were surveyed using full spectrum SM3 detectors and bat calls were identified using the USFWS-approved Automated Acoustic Bat ID Software Program, Kaleidoscope Pro (version 3.1.7; www.wildlifeacoustics.com), with NLEB calls examined and verified by a qualified biologist. The presence/absence survey focused on areas within and near forested habitat that are expected to be disturbed by Project development. NLEB was not qualitatively verified at any of the four acoustic stations at any of the surveyed sites.

2017

The acoustic surveys were conducted from June 16 – 20, 2017, consistent with USFWS Guidelines. Surveys were conducted at three survey sites (six survey stations), for a total of 12 valid detector nights. Bats were surveyed using full spectrum SM4 detectors and bat calls were identified using the USFWS-approved Automated Acoustic Bat ID Software Program, Kaleidoscope Pro (version 4.2.0; www.wildlifeacoustics.com), with NLEB calls examined and verified by a qualified biologist. The presence/absence survey focused on areas within and near forested habitat that are expected to be disturbed by Project development.
Similar to the 2016 surveys, NLEB were not identified by acoustical software at any of the six acoustic stations on any of the surveyed nights in 2017. Therefore, this species is considered likely absent from the Project. Surveys are considered complete for all six survey stations at the three sites in 2017, and no further action is recommended to confirm NLEB bat absence pursuant to USFWS *Northern Long-eared Bat Interim Conference and Planning Guidance* (USFWS 2014) and *2017 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2017).

3.2.2 Bat Collision Risk

Given the proximity and similar levels of habitat, it is likely that the species composition and use levels will be similar to what was documented at the Blazing Star site in 2016. In that study, low-frequency bat species, such as hoary bats and silver-haired bats, composed nearly 90% of bat passes at met tower stations and 84% of bat passes at bat feature stations. At the met tower stations in the 2016 Blazing Star survey, activity was relatively low during the spring, with activity increasing in the summer, peaking in mid—July; the activity was then moderate throughout the early fall, with a steady decrease from the last week of September through October and November. Bat activity at bat feature stations was highest in early July (Pickle et al. 2017). Bat activity level and patterns at the Blazing Star II site will be assessed when data collection is complete. Based on information from other wind energy projects in Minnesota and South Dakota, impacts are likely to be greatest during the peak migration (July 15–September 15), and at low wind speeds, or associated with the passage of weather fronts.

3.3 Listed Butterflies and Grassland Birds

Blazing Star II contracted with WEST to evaluate grassland parcels that have the potential to be affected by project construction, to determine if surveys for the federally threatened Dakota skipper and endangered Poweshiek skipperling and/or breeding grassland bird surveys should be recommended prior to construction. Once a layout is provided, WEST will conduct a field assessment of grassland parcels with the potential to be affected, and this risk assessment will be updated.. As project development continues and/or turbine layout changes, additional assessment (desktop and field if necessary) will occur if any temporary or permanent impacts are proposed for grassland habitats that were not examined as part of this assessment, in order to help inform siting and risk assessment.

3.4 Summary of Concerns Identified During Research and Analysis

Issues discussed in this report are ranked below with the assumption of no avoidance, minimization or mitigation. The level of concern would decrease if avoidance, minimization and mitigation were employed. Rankings are described below.

- High – Without avoidance, minimization or mitigation, the Project is likely to pose a significant risk to the topic of concern.
- Moderate – Without avoidance, minimization or mitigation, the Project is likely to pose a moderate risk to the topic of concern.
- Low – Without avoidance, minimization or mitigation, the Project is likely to pose a low risk to the topic of concern.
- Minor – Without avoidance, minimization or mitigation, the Project is likely to pose minimal risk to the topic of concern.

These conclusions and recommendations will be reevaluated upon completion of Tier 3 assessments at the Project site.

High Level of Concern

There are no identified issues of high concern.

Moderate Level of Concern

Subject: Migratory Bats

Regulatory Framework: Federal and State Endangered Species Act.

Migratory tree bats that have experienced mortality at other wind sites are likely present at the site during spring and fall migration. It is likely that mortality will occur at the Project site, and that mortality will be similar to other wind energy projects in agricultural regions of the Midwest with low-to-moderate bat activity. Hoary and Eastern Red Bats may experience the greatest mortality.

Risk of mortality at the Project site is likely to be greatest on nights in the July 15-September 15 period which correspond to the passage of the largest numbers of migratory tree bats and an increase in the abundance of Big Brown Bats. Due to changing weather conditions, each night carries a different level of risk. During the periods of peak passage, weather conditions that are most conducive to high mortality rates occur with warm temperatures (>50F) and low wind speeds (<6.5m/s) (Baerwald et al. 2009, Arnett et al. 2010, Good et al. 2011, Cryan and Brown 2007). In addition, risk is higher on the first night following the passage of a low pressure system when the prevailing wind shifts from a southerly to a northerly direction (Cryan and Brown 2007, Good et al. 2011).

Subject: Bald Eagle

Regulatory Framework: BGEPA, MBTA, State Endangered Species Act

There is a moderate level of concern for potential bald eagle mortality at the site. The bald eagle is protected under the BGEPA, and is a state special concern species. There are nine occupied, active bald eagle nests within 10 miles of the site, although no bald eagle nests are located within the Project boundary.

Bald eagles were observed during avian use surveys to date. Most of observations were within the Project boundary, at avian use survey points or observed incidentally while on site; several observations of bald eagles associated with the two active nests within two miles of the Project boundary have also been noted to date.

The Project boundary contains open water habitat, which may provide bald eagle foraging habitat. The bald eagle population is expanding in Minnesota, and it is possible that bald eagles may establish additional nesting territories within 10 miles of the site at some point in the future. Tier 3 studies to date indicate relatively higher bald eagle use in the fall and winter compared to spring and summer in the Project.

WEST monitored nest activity at two nests that were outside of, but within two miles of the site. Nest 1744 is located approximately 0.6 miles west of the Project boundary, in between Steep Bank Lake and Dorer WMA. After a follow up nest check in May was conducted to confirm the nest was active, five four-hour nest activity monitoring sessions were conducted at Nest 1744: twice a month in June and July, and once in August. Overall the flight paths documented in June – July indicated that most of the flights to and from the nest are either associated with Steep Bank Lake to the southeast or the chain of lakes and wetlands south of Dorer WMA to the north and northwest, although several flights also occurred to the north-northeast of the nest (Figure 2). Overall, the activity patterns documented with this nest indicate that the eagles are primarily using Steep Bank Lake and the lakes south of Dorer WMA for foraging, both of which are within approximately one mile of the nest. Eagles associated with this nest may periodically use areas outside of

these lakes (including both the lakes in the WMA itself as well as in private lands elsewhere), but it appears that these features, especially areas within one mile of the nest, are the higher use areas related to the eagle nest activity. This would indicate that the primary use associated with the nest would occur outside the Project boundary, with the exception of Steep Bank Lake, which is inside; avoiding siting turbines adjacent to this lake would minimize risk to eagles associated with this nest.

Nest 1554 is located approximately 0.6 miles south of the Project boundary on the north shore of Lake Shaokatan. After a follow up nest check in May was conducted to confirm the nest was active, five four-hour nest activity monitoring surveys were conducted at Nest 1554: twice a month in June and July, and once in August. Overall the flight paths documented in June – July were primarily associated with Lake Shaokatan, with flights along the shore or above the open water portion of the lake; however some flights did occur with the eagles either leaving or arriving from both the north and south of the lake (Figure 3). Eagles associated with this nest may periodically use areas outside of the Lake, including the wetland complexes approximately 0.5 to 1 mile to the north of the nest within the site Project boundary. In general, it is anticipated that the higher use areas related to this nest's activity would primarily be within one mile or less of Lake Shaokatan. Minimizing the siting of turbines within one mile of Lake Shaokatan would minimize risk to eagles associated with this nest.

Low Level of Concern

Subject: Listed Butterflies

Regulatory Framework: Federal and State Endangered Species Act

The federal threatened Dakota skipper and federal endangered Poweshiek skipperling have been documented to occur in Lincoln County and may occur within native prairies or prairie remnants within the Project boundaries. However, field visits indicate that it is likely that the grassland parcels that may be affected by construction are likely to be relatively low quality and not suitable butterfly habitat. Once a layout is provided and WEST conducts site-specific grassland habitat assessments, an update to the state-listed bird risk assessment will be provided.

Subject: State-Listed Threatened and Endangered Bird Species

Regulatory Framework: State Endangered Species Act, MBTA

In the Tier 3 surveys conducted to date, no state-listed endangered or threatened species has been documented at the site. In general the risk to state-listed species is anticipated to be low, particularly as areas of higher quality habitat (such as that at WMAs, WPAs, and moderate and high biodiversity sites) will be avoided. Once the data from the full year of avian use surveys is analyzed, an update to the state-listed bird risk assessment will be provided.

Subject: Northern Long-eared Bat

Regulatory Framework: Federal Endangered Species Act

NLEB is a federal threatened species under the ESA. The NLEB is experiencing steep population declines due to White Nose Syndrome. This species is known to occur throughout Minnesota, although it prefers

forested habitat. Two years of summer presence/absence surveys indicates that the species is likely absent during the breeding season, although it could be present during migration.

Subject: Migratory Passerine Birds
Regulatory Framework: MBTA

Passerine bird mortality during spring and fall migration is typically the greatest source of bird mortality at wind energy developments. Migratory passerine use of the site appears typical of Midwestern agricultural habitats based on avian use surveys conducted to date, and mortality for these species is anticipated to be similar to that at other Midwestern wind energy developments.

Subject: Breeding Bird Collision
Regulatory Framework: MBTA

Breeding bird collision is an issue of low concern due to the small numbers of at-risk species likely in cropland where the majority of the turbines will be placed. Analysis of point count data from the breeding season will be used to reevaluate this conclusion. In cropland, where most wind turbines will be placed, post-construction mortality is anticipated to be similar to mortality at other Midwestern wind energy projects. Once the data from the full year of avian use surveys is analyzed and the final project layout is available, an update to the breeding bird risk assessment will be provided.

Subject: Waterfowl and Waterbirds
Regulatory Framework: MBTA

Southwestern Minnesota is known for significant activity during the waterfowl migration, and waterfowl and waterbird activity was documented at the site during avian and wetland use surveys conducted during the spring 2017 migratory period. Canada Goose, Franklin's Gull, Mallard, Lesser Scaup, American Coot and Blue-winged Teal l are commonly observed species based on surveys conducted to date. Collision risk is low for waterfowl and waterbird species because studies and observations indicate that waterfowl and waterbirds can see and avoid turbines during flight. However, due to the observed activity level during spring migration, turbine placement should avoid areas of high waterfowl activity whenever possible. Once the data from the full year of avian use surveys is analyzed and the final project layout is available, an update to the waterfowl and waterbird risk assessment will be provided.

Subject: Raptor Collision Risk
Regulatory Framework: MBTA

There are no known raptor migration routes near the site. Due to the general low raptor use in this part of the state and typical raptor mortality rates, it is unlikely that significant numbers of raptors would be killed at the Project site. This risk assessment will be updated once the data from the site-specific large bird surveys is available and analyzed.

Subject: SGCN and state SC bird species
Regulatory Framework: MBTA

Fourteen Minnesota SGCN species and two state SC species were observed during avian use surveys conducted from July 2016 through June 2017. These species are considered vulnerable, declining or rare. None of them was common at the site. Franklin's gulls and American white pelicans were the two state SC species seen to date at the site. Northern Harrier were the most frequently observed SGCN species. Northern Harrier typically has had low mortality at wind facilities likely due to its flight behavior, which is usually observed to be below 20 m. Of the remaining SGCN species, only Upland Sandpiper was regularly observed in cropland habitat, and mortality for sandpipers is typically low at wind energy facilities. Once the data from the full year of avian use surveys and the wetland use survey is analyzed and the final project layout is available, an update to the SGCN/SC risk assessment will be provided.

Subject: Minnesota Biological Survey sites of moderate significance

Regulatory Framework: None

The Minnesota Biological Survey has identified multiple sites of potential biological diversity within the Project area. There are no areas mapped as high or outstanding biodiversity significance located in the site. There are several areas that are considered of moderate biodiversity significance (either associated with state managed lands or riparian or stream corridors), and the majority of the areas identified by the Minnesota Biological Survey in the Project boundary are considered below the standard of statewide significance. Impacts to the high and moderate biodiversity sites during siting and construction will minimize impacts to biologically diverse communities.

Subject: Grassland Bird and Waterfowl Habitat Displacement

Regulatory Framework: None

As described in Section 3.1.5, there is some evidence that some grassland specialist bird species may be susceptible to displacement effects from wind turbines. Grassland habitat (particularly larger than > 40 acre tracts) in and near the Project site is primarily located within WMAs and WPAs, where turbine siting is precluded. While habitat displacement during the breeding season is a possibility, suitable grassland is limited at this site, making this an issue of low concern.

Waterfowl may use agricultural fields in and near the site during migration. Waterfowl have been observed to avoid foraging near wind turbines, although habituation to the presence of wind turbines has also been observed. Due to the likelihood of habituation, and the availability of agricultural land for foraging outside of the wind facility this is considered an issue of low concern.

These preliminary conclusions will be reevaluated after the collection of breeding and fall migration data are available and the project layout is finalized.

Minor Level of Concern

Subject: Federal and State Listed Plant Species

Regulatory Framework: State and Federal Endangered Species Act

State and federal listed and special concern plant species in this part of the state are typically associated with prairie remnants, wetlands that have not been degraded by agricultural activity. If the Project avoids wetlands, lakes, and native prairie areas, impacts to these species are not likely.

Subject: Blanding's Turtle – State Threatened Reptile

Regulatory Framework: State Endangered Species Act

The Blanding's turtle are typically associated with larger stream or river systems, which are not found at the Project, although it can be found in a variety of riparian or wetland types and in this part of Minnesota can be found even in small stream complexes. If the Project avoids and minimizes impacts to wetlands, lakes, streams and adjacent sandy uplands, and species-appropriate BMPs are implemented during construction, impacts to this species are not likely.

4. AVOIDANCE AND MINIMIZATION MEASURES

4.1 Preconstruction Siting and Design

4.1.1 Turbine Siting

Wind turbines and associated facilities for the Project will be sited with consideration for the topographic and environmental characteristics of the site, efficiency of selected turbine models, and minimal impacts to area residents. Siting also considers the MPUC General Wind Turbine Permit Setbacks and Standards for LWECS permitted pursuant to Minnesota Statute § 216F.08 and the setback requirements of Lincoln County. Table 3 enumerates setbacks that will be adhered to in siting the Project.

Table 3. Project Setback Requirements

Features	Setback
Wind access buffer (from nonparticipating)	3 RD nonprevailing, 5 RD prevailing wind direction
Public or private right-of-way	76 m (250 ft)
Participating occupied structures	300 m (1,000 ft) (plus any additional distance to meet noise standard)
Nonparticipating occupied structures	300 m (1,000 ft) (plus any additional distance to meet noise standard)
Internal wind spacing	5 RD prevailing, 3 RD nonprevailing with up to 20% of turbines closer than this requirement

The layout and design of the Project will maximize energy generation while minimizing impacts to the land and surrounding community. The Project will adhere to a voluntary setback of a minimum of 1,000 feet from nonparticipating occupied structures, unless other arrangements have been made with specific residents. A 250-foot setback has been incorporated from all public and private rights-of-way, and all turbines will be sited a minimum of five RD from the Project perimeter and nonparticipating properties in the prevailing wind direction and three RD in the non-prevailing wind direction.

The Project will be designed in an environmentally conscientious manner, with input from wildlife agencies and relevant site-specific information gathered during avian surveys. As currently planned the Project will

either meet or exceed state and local siting requirements, and will meet the concerns of wildlife agencies. To minimize adverse impacts to avian species, nearly all wind turbines and associated facilities will be sited on cropland.

Access roads, wind turbine locations, and the underground collector system will not require significant cut and/or fill.

4.1.2 Collection and Transmission Lines

The Project design for electrical facilities will be based upon the Avian Power Line Interaction Committee's (APLIC) suggested practices for minimizing risk of electrocution of birds from power lines. Electrocution is commonly a concern with electrical facilities, and the electrocution of large birds, such as raptors, is more commonly associated with distribution lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device. Adequate spacing of the transmission line design diminishes the risk of raptor electrocution, and the Project will incorporate such a design so as to eliminate the risk of electrocution. To the extent practicable, the collector system will be placed underground, thereby eliminating the risk of electrocution, as well as minimizing impact on existing farm operations. Any disruption to drainage tile will be avoided to the extent possible during construction; further, any damage to tile as a result of construction activities will be repaired.

Historically, utilities have had success in reducing collisions on transmission lines by marking the shield wires with flight diverters (FDs). FDs are preformed, spiral-shaped devices made of polyvinyl chloride that are wrapped around the shield wire and are designed to increase its visibility. Other devices will be considered if they are proven to be effective.

4.2 Construction

4.2.1 Minimizing Temporary Disturbance

Areas of construction and temporary ground-disturbance activities will be minimized to the extent practicable. Temporary disturbances during construction of the Project include crane pads at each turbine location, temporary crane paths, temporary laydown areas at the base of each turbine, trenching-in the underground electrical collection system, and storage or stockpile areas. The majority of this work will occur within tilled and cultivated agricultural fields, thereby minimizing impacts to quality habitat and habitat fragmentation. In areas where temporary ground-disturbance activities occur, such as temporary crane paths or the installation of underground infrastructure, preconstruction vegetation will be restored.

Additionally, while impacts to avian nesting cover are not anticipated due to construction timing, clearing of perennial vegetation and any potential avian nesting cover will be avoided to the extent practicable. While efforts have been made to avoid all areas of native prairie, in the event that change in project design causes the relocation of facilities into areas of nesting cover, the construction sequence will be re-examined so as to not disturb nesting cover that contains hatched or unhatched clutches.

Management measures will be implemented to restore areas that are impacted due to temporary construction activities. After all practicable avoidance measures are taken to reduce temporary impacts to vegetated areas, any temporarily disturbed areas will be re-vegetated to blend with existing vegetation. Further measures will be taken to minimize disturbance from construction activities. Construction teams will be made aware of,

and attempt to prevent spreading of, invasive species via the movement of people, materials and equipment into and out of the site to prevent the spread and colonization of any new populations of invasive species. Control measures include washing off any soil, dirt and debris on equipment, such as wheels and turbine components, as well as footwear if necessary, prior to moving equipment over native prairie land, as soil may be embedded with roots or seeds of invasive plant species.

The Project's Storm Water Pollution Prevention Plan (SWPPP) will be utilized as a resource to ensure control measures are taken to prevent erosion and runoff during construction of the Project. Of particular concern is runoff into sensitive habitats as well as into streams and roadside ditches. The measures within the SWPPP will comply with the requirements of the MPCA General Permit for Storm Water Associated with Construction Activity under the National Pollutant Discharge Elimination System (NPDES) / State Disposal System Permit Program. These rules are reflected in the construction erosion and sediment control BMPs described below.

- Disturbed areas will be minimized and silt fence will be installed at the down gradient edge of disturbed area, prior to disturbance, to limit sediment flow and pollution to natural areas outside the construction zone.

- If streams are within the area of construction additional silt fence must be placed along the edge of the stream 3 m (10 ft) from edge of channel, if possible, as a primary sediment break. If natural vegetation along the edge of stream is to be disturbed, silt curtain must be placed at the edge of said stream, in a fashion proper with rate of flow, as a secondary precaution. If natural vegetation is not to be disturbed then it should provide necessary filtration to preclude the need of silt curtain in the stream.

- If soil is disturbed outside of the agricultural till area, the soil must be stabilized within fourteen (14) days after continuous disturbance ceases. If said area is along special or impaired water (PWI waters) the area must be stabilized within seven (7) days of disturbance. Ditch bottoms 60 m (200 ft) from edge of surface water or property must be stabilized within 24 hours. If soil is disturbed around a culvert or other water discharge location, the area must be stabilized within 24 hours of disturbance.

- Erosion and sediment control devices require weekly inspections to ensure that they are staying effective. In the event of a half inch (½") or greater rainfall, inspection must occur within 24 hours.

- If failures are found, any discharge associated with said failure must be cleaned up as soon as possible and no later than seven (7) days from time of discovery.

- Any track out from vehicles traveling through the site onto roadways must be cleaned up within 24 hours.

- Upon construction completion, disturbed areas must be stabilized within 14 days.

- Material stockpiling will be kept to specified areas and will be surrounded with silt fence at least 2.4 m (8 ft) from the edge of the stock pile to provide a barrier for potential erosion and sediment run

off from the stockpile yard. Hazardous material will be handled per the individual material guidelines as well as on-site spill kits.

4.2.2 Site Maintenance

Proper caution and safety measures will be exercised to minimize risks to avian and bat populations near and at the site. To minimize the risk of wildfire that could destroy bird and bat habitat, or that could be injurious to construction personnel, the contractor will be responsible for maintaining a clean and orderly site. Flammable chemicals, petroleum and other materials with the potential for combustion will be handled and stored in a safe manner. Accumulation of outdoor storage or waste will be addressed immediately so as not to attract birds and bats. The site manager will be responsible for enforcement of BMPs that focus on reducing impacts to birds and bats, as well as the implementation of this document.

4.2.3 Nest Management

This ABPP includes procedures for nest management for the life of the Project on operational grounds and on Project structures. These procedures will be explained to Project employees during training to ensure uniform treatment of avian nest issues among personnel. Many bird species build nests on transmission and generation facilities as well as on the adjacent maintenance pads, roads and other ground cover. Species such as barn swallows, cliff swallows, kingbirds, crows, robins and several raptor species are known to use generation and transmission facilities as nesting substrate. Additionally, turbine pads can provide substrate for ground nesting species such as common nighthawks, killdeer, and horned larks among others. Depending on where nests are located, they may pose fire, safety, power outage, bird electrocution, and bird collision risks. Nest management may include trimming nest material, removing nests, or relocating nests to areas of less risk. In some instances nesting platforms can be constructed in locations that reduce the risk to birds using the area and to equipment.

By siting turbines, collector lines and other facilities in agricultural lands, impact to bald eagles and marbled godwits are minimized. However, in the absence of other suitable nest sites, other species such as some songbirds and raptors will use artificial structures for nesting. State and federal laws and regulations prohibit these nests from removal at certain times of the year without first obtaining authorization from state and federal wildlife agencies. It is unlawful to destroy nests when eggs or young birds are in them. Project employees will be trained to understand that no impacts to occupied nests can occur unless there is an immediate safety threat, in which case, coordination with the USFWS and MNDNR will need to occur. While some nests are benign and need no management, others may need to be managed to reduce the risk of equipment failure, bird and bat collisions, and electrocution.

4.2.4 Training

The contractor will be the lead entity for construction management and will be responsible for providing training to all construction staff working on the Project. Training, both formal and informal, will be provided for all construction staff depending on the work responsibilities of personnel. A variety of formats will be employed to present information to those receiving training, such as department or group meetings and discussions, one-on-one training, presentations, posters, and handouts. Copies of any training materials distributed will also be kept at the construction trailer/field office, and the hours and attendees of training sessions will be documented by the appropriate designee. Training will include but is not limited to:

- environmental compliance,

- threatened & endangered species, and species of concern,
- avian and bat issues,
- sediment and erosion control BMPs,
- vegetation management and noxious weeds,
- wetland and water resources,
- hazardous materials,
- water crossings, and
- cultural and historic resources.

Expected formal training opportunities include:

- preconstruction meeting with contractor and construction managers,
- preconstruction meeting with relevant agencies,
- regular status meetings as determined by contractor, and
- regular field meetings with construction personnel.

4.2.5 Wildlife Concerns

The contractor and subcontractors will work to implement BMPs to construct the Project in a way that minimizes impacts to avian and bat species on site. This includes maintaining flexibility in the construction of components where feasible, as well as encouraging the education of construction teams on site-specific environmental and faunal concerns. Education may also include training in the identification of different types of birds and bats, which may be accomplished by utilizing posters that identify sensitive species, and which are posted at the construction trailer facility. Site personnel will be required to receive training on the Wildlife Incident Reporting System.

The contractor will be required to have a proper safety program in place and to ensure that construction and operations crews have been adequately trained to that effect. To minimize the risk of wildfire that could destroy bird and bat habitat, or that could be injurious to construction personnel, construction crews will exercise proper caution and safety measures while handling and storing flammable chemicals, petroleum, and other materials with the potential for combustion. Operations and Maintenance (O&M) staff will be trained on this document, and training on avian protection planning and practices external to this document is highly encouraged.

In the event of permit noncompliance issues, the contractor will take the measures necessary to correct the situation and maintain compliance. A stop work order may be issued if an emergency occurs, or if a violation is not corrected in a reasonable time. The contractor will designate a project representative responsible for notifying and documenting issues of noncompliance with the permit.

Avian Species. The primary concern for avian species during the construction phase is related to disturbance of state special concern and SGCN species. Construction personnel will be trained to identify potential nesting habitat in grasslands and wetlands and to contact the Site Manager prior to disturbance. The Site Manager will coordinate any necessary special avoidance methods with the environmental inspector, and will notify the construction personnel when construction can continue.

Bat Species. The primary concern for bats during the construction phase will be the destruction of occupied roosting and breeding habitat for big brown bat (e.g., large trees, old buildings). Between April and October 15, if construction will remove large trees, old buildings, or directly impact potential roosting or breeding habitat, construction personnel will be directed to halt activities and a trained biologist will search the area to ensure no bats are present. This searching can consist of visual inspection of trees, old buildings, and cavities where bats may exist, or of watching for bats departing these areas at dusk or returning at dawn. Construction personnel will be trained to identify potential habitat and required to contact the Site Manager prior to disturbance. The Site Manager will coordinate the searches with the environmental inspector and will notify the construction personnel when construction can continue. If areas are disturbed before April 1 or after October 15, these measures are not necessary.

General Wildlife Resources. Construction personnel will be trained to identify and avoid impacts to wildlife in general. During construction, personnel will visually inspect each open trench or pit daily to determine if any animal has become trapped in the trench or pit. If an animal has become trapped, the Site Manager will be notified and appropriate action taken to safely remove and release the animal. Training in general wildlife awareness will be required of all construction personnel.

4.2.6 Construction Monitoring Plan

The Project is sited in an area dominated by cultivated agriculture, thereby offering a low to moderate risk for potential environmental impacts. While this proper siting avoids and minimizes most potential impacts to birds, bats, and other wildlife, the following training and action will be implemented during the construction phase. Different phases of construction will utilize different construction personnel at different times of the year. Therefore, the construction monitoring plan is designed to be implemented during these appropriate times, such that the construction personnel receive the necessary training and are implementing the plan accordingly. Construction personnel will be trained in the following areas when appropriate:

- awareness and general identification of SGCN species;
- awareness of potential bird nesting areas;
- awareness of potential bat roosting/breeding habitat and; and
- awareness of general wildlife issues.

Awareness training makes construction personnel responsible for observing and then reporting potential issues to the site representative or construction manager. The site representative will also be trained in procedures to follow and actions to take at different times of year and for different situations.

4.2.7 Road Minimization and Traffic Plan

During the construction period, heavy trucks, light trucks, and other construction equipment will access construction sites via existing county and gravel roads. New access roads will be built only as necessary to reach the turbines. Road widening will be limited to the extent feasible during the construction phase of the Project. Erosion and sediment control requirements apply to any road construction activities.

Construction vehicle travel will be reduced by requiring all construction workers to park their personal vehicles at a central location on the Project site. All construction and construction-related activities will be confined to the minimum area necessary to safely construct generation, transportation, transmission and maintenance facilities as depicted in the final site design and engineering plans. Approved work space limits

will be marked and maintained throughout the construction period. All construction-related traffic within the wind farm areas will be limited to a maximum speed limit of 25 mph unless a lower speed limit is posted. Any carrion resulting from collisions with vehicles will be removed from roads constructed to maintain or access Project facilities.

Upon completion of construction, any expanded road widths will be narrowed to approximately 14–16 feet, and vegetation alongside the roads will be restored.

During the operational phase of the Project, traffic volume will be minimal, consisting mainly of local traffic and routine trips by technicians to check and maintain wind generation and transportation equipment.

4.2.8 Collection and Transmission Lines

There is potential for temporary displacement of wildlife during the construction of both the wind farm and the transmission line. However, this displacement is anticipated only for a short distance and it is temporary. Fallow farm fields, fencerows and woodlots in cultivated areas may provide cover for displaced birds during construction of the transmission line.

Raptors, waterfowl and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions with transmission structures are a possibility in areas where there are agricultural fields that serve as feeding areas, wetlands, and open water. As such, transmission structures will not be located within these wetland areas to the extent feasible.

5. OPERATION AND MAINTENANCE

5.1 Avian and Bat Mortality

A combination of several factors contributes to avian and bat susceptibility to wind turbine collisions. These factors may include the abundance and composition of avifauna in the area, the way in which avifauna are dispersed across a geographic area, the presence of suitable nesting and foraging habitat, the presence and abundance of prey, the time of the day or night, season of the year, and the siting or layout of wind turbines. Predicting the fatality rates for the Project is best understood by utilizing the data and information learned from a number of key studies, including Jain (2005), Young et al. (2003), Erickson et al. (2004), Johnson et al. (2000), Poulton (2010), and the National Research Council (2007).

Based on Project data gathered to date, no significant adverse impacts are anticipated from the Project. The anticipated fatality rate for birds and raptors is expected to be within the overall range for other projects in Minnesota and South Dakota (Table 4). Publicly available studies from Minnesota and South Dakota (for studies conducted after 2005) suggest the range of estimated fatality rates is 0.44 to 5.59 birds/MW/study period and 0 to 0.37 raptors/MW/study period. Based on publicly available studies in Minnesota and South Dakota for studies conducted after 2005 (Table 4), the anticipated fatality rate for bats ranges from 0.16 to 20.19 bats/MW/study period. It is important to note that the study period often differs between surveys included in Table 4; i.e., a study period for a project focusing on bats may be from July through October, or may cover the entire active period (April through early November). As described further in Section 5.3.1, the post-construction mortality surveys at Blazing Star II will be conducted from March 15 through November 15, following DNR survey guidelines.

Table 4. Avian and Bat Fatality Rates at Minnesota and South Dakota Wind Farms (from publicly available data)

Location	Project Name	Adjusted Bird Fatalities per MW per study period	Adjusted Raptor Fatalities per MW per study period	Adjusted Bat Fatalities per MW per study period	Reference
Minnesota	Big Blue	NA	NA	6.33	Chodacheck et al. 2014
Minnesota	Elm Creek	1.55	0	1.49	Derby et al. 2010
Minnesota	Elm Creek II	3.64	0	2.81	Derby et al. 2012
Minnesota	Grand Meadow	NA	NA	3.11	Chodacheck et al. 2014
Minnesota	Lakefield	1.07	NA	20.19	Westwood Professional Services 2015
Minnesota	Moraine II	5.59	0.37	2.42	Derby et al. 2010
Minnesota	Oak Glen	NA	NA	3.09	Chodachek et al. 2014
Minnesota	Pleasant Valley	0.68	0	1.80	Tetra Tech 2017
Minnesota	Prairie Rose	0.44	0.08	0.41	Chodacheck et al. 2015
South Dakota	Buffalo Ridge I	5.06	0.2	0.16	Derby et al. 2010
South Dakota	Buffalo Ridge II	1.99	0	2.81	Derby et al. 2012
South Dakota	Prairie Winds	1.41	0 – 0.03	1.05 – 1.23	Derby et al. 2012 and 2013
South Dakota	Wessington Springs	0.89	0.06 – 0.07	0.41 – 1.48	Derby et al. 2010 and 2011
Range		***0.44 -5.59***	***0 - 0.37***	***0.16 – 20.19***	

An avian use study was begun in summer 2016 to define species in the Project area and help to estimate the mortality risk level. The WEST study uses the hierarchical data collection and decision-making process in the USFWS Land Based Wind Energy Guidelines (USFWS 2012).

5.2 Operational Procedures

During operations and maintenance, the following measures will be implemented:

1. *Minimize Lighting.* All unnecessary lighting, except those required for safety by the FAA and other lights needed for safety and security purposes, will be turned off. USFWS's draft Wind Turbine Guidelines recommend that wind turbine lighting be designed such that the blinking lights illuminate simultaneously to prevent disorientation of birds and bats. This measure is less likely to attract insects to a constant light source, and thus the birds and bats that feed on them. Further, the USFWS recommends the use of minimum intensity, maximum off-phased strobe lights where necessary; constantly lighted sources, such as L-810 obstruction lights, are not recommended. The FAA recommends synchronized flashing or blinking red lights (L864), and generally recommends lighting only the perimeter of the wind farm project with lighting gaps of no more than 0.5 mile between lights, and no more than one mile across turbine clusters, as well as lighting turbines that are isolated from strings or clusters of other turbines. Minimizing the duration of the flash and maximizing the time between flashes is also beneficial. Turbines within the Project site will be lighted in compliance with FAA minimum standards. In keeping with the Draft Guidelines, the use of motion- or infrared-activated lights on building facilities will be investigated as a method to reduce attraction of insects, birds and bats. The use of high-intensity lights such as spotlights, steadily-burning bright lights, and sodium vapor lights will be minimized.
2. *Limit Foraging Opportunities.* Foraging opportunities for raptors and other scavengers will be limited by

    - regular clearing of road kill or other carcasses around the Project site to remove scavenger food sources.
    - removing rock and brush piles that could create small bird roosting and raptor prey habitat from within 100 ft of turbines.
    - prohibiting food waste littering by employees.

    In addition to these measures, general farming practices such as tilling, harvesting and mowing will provide another measure that will limit the accumulation of surface water and thereby deter avifauna.

3. *Minimize Risk of Vehicular Collisions.* Project access roads will be posted with a 25-mph speed limit.
4. *Overhead Utilities Maintenance.* APLIC (2006) guidelines for overhead utilities maintenance will be followed where possible.
5. *Meteorological Towers.* Temporary met towers be removed, and replaced with an unguyed permanent lattice tower for meteorological monitoring.
6. *Minimize Fire Risk.* Fire risk will be minimized by utilizing spark arrestors on all electrical equipment, and by restricting smoking to designated site areas.
7. *Proper Hazmat Handling.* Hazardous materials will be handled in accordance with federal and state regulations.
8. *Blade Feathering. The Project will follow voluntary operation measures to minimize bat fatalities, including, when commercially feasible, committing to feathering turbine blades up to the manufacturer set cut-in speed at night during the fall bat migration season (August 1 – October 31) whenever evening temperatures exceed 50 degrees Fahrenheit.*

5.3 Tier 4 – Post-construction Avian and Bat Monitoring

To assess actual direct collision impacts to bird and bat species from the Project, post-construction mortality monitoring will be conducted at the site for up to two years, to be determined once the Tier 3 studies are concluded and pending further coordination with the agencies. These surveys will include searcher efficiency and carcass removal trials, and the overall mortality rate will be adjusted based on the trial results. This protocol is based on guidelines from the USFWS Land Based Wind Energy Guidelines (USFWS 2012), the Avian and Bat Survey Protocols (MNDNR 2014) and the National Wind Coordinating Collaborative Comprehensive Guide to Studying Wind Energy/Wildlife Interactions (Strickland et al. 2011). Estimates of mortality will follow either the Schoenfeld or Huso method as appropriate per Strickland et al. (2011).

Post-construction mortality data will be compiled on an annual basis and reported to the USFWS and MNDNR. Results of the post-construction mortality monitoring will be evaluated based on comparison with other mortality figures for similar wind energy projects, and other pertinent factors such as weather events and factors related to wind facility operations, such as lighting. Should a reasonable level of mortality be exceeded, a process of adaptive management will be used to reduce the Project impacts below a reasonable level, and success or failure of these measures will be documented through post-construction mortality surveys.

These mortality surveys will require the collection of bird and bat carcasses. A Special Purpose-Migratory Bird Mortality Monitoring permit is required from the USFWS (http://www.fws.gov/forms/3-200-81.pdf) to handle bird carcasses. All handling of bird carcasses will be carried out under the appropriate state and federal permits.

5.3.1 Mortality Surveys

For compliance with the MBTA, post-construction mortality monitoring methods will be developed in cooperation with the USFWS and MNDNR and follow guidelines set forth in the following documents:

- Avian and Bat Survey Protocols (MNDNR 2014)
- US Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS 2012)

Compliance with the BGEPA and MBTA, allowing the 'possession' of the bird/carcass requires the possession of a Salvage, Rehabilitation, Special Purpose, Scientific Collecting, or related permits. The issuance and use of Federal Migratory Bird permits also requires annual reporting to USFWS. Contacts at the USFWS and DNR are:

USFWS
Office of Migratory Bird Permits
US Fish and Wildlife Service
5600 America Boulevard West, Suite 990
Bloomington, MN 5437-1458

MN State Salvage Permit
Lori Naumann
Permit and Promotions Specialist

Nongame Wildlife Program Information Officer
Division of Ecological and Water Resources
Department of Natural Resources
Box 25, 500 Lafayette Rd.
St. Paul, MN 55155
Telephone Number 651-259-5148

Intensive Post-Construction Mortality Surveys. The greatest mortality risks occur during the spring and fall migratory periods for birds and the fall migratory period for bats. Risks are lower during the breeding season and at a minimum during the winter season when passage rates and abundances of birds and bats are at seasonal lows. Intensive mortality surveys will be conducted from March 15 through November 15, following the DNR Survey Protocols, at a biweekly frequency determined through review of the Tier 3 study results and coordination with the agencies[1], to encompass bird and bat activity during the spring migration, breeding season and fall migration. At least one full year of surveys will be conducted, with an additional year of follow up surveys possible, depending on the results of the results of the first year of Post-Construction Monitoring.

Final design of the post-construction surveys will occur after Tier 3 studies are finished and through coordination with the agencies, but at this time it is anticipated that five turbines will be selected for full plot (120 meters by 120 meters) searches, with the remainder of the turbines being searched on the road and pads out to 60 meters from the turbine. Standard methods for searching for carcasses will be employed (e.g., Strickland et al. 2011).

Bald Eagle and Large Bird Mortality Surveys. The mortality of a bald eagle is likely to be a rare event that is best detected by monitoring all turbine locations over an entire year. Searches will employ standard methods. Searcher efficiency is likely to be high from November 1 through May 31 when vegetation is absent or low. Efficiency is likely to be lower from June 1 through October 31 when vegetation will obscure most of the area, and carcasses not caught on vegetation will be hidden. Results of the large bird use surveys done to date do not indicate a need for separate raptor/eagle mortality surveys. This conclusion will be revisited once the Tier 3 studies are concluded.

5.3.2 Searcher Efficiency Trials

The objective of the searcher efficiency trials is to estimate the percentage of casualties which are found by searchers. Searcher efficiency trials will be conducted in the same plots that carcass searches occur. Trials will be conducted during all seasons. Estimates of searcher efficiency will be used to adjust the total number of carcasses found for those missed by searchers, correcting for detection bias. Searcher efficiency trials will be conducted within both the search plots and on roads and pads.

Searcher efficiency trials will begin when carcass search studies begin. Personnel conducting carcass searches will not know when trials are conducted or the location of the detection carcasses. At least 25 bird carcasses will be used each season, along with at least 50 total bat carcasses for each trial. Bird carcasses will include both large and small birds to best represent species that may be encountered in the field. Bird carcasses will

[1] Blazing Star will continue to review Tier 3 results and determine if biweekly surveys remain appropriate based on a more complete set of data.

consist of non-native/non-protected or commercially available species such as house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), rock pigeons (*Columbia livia*), bobwhite quail (*Colinus virginianus*), hen mallards (*Anas platyrybnchos*) or hen pheasants (*Phasianus colchicus*).

All carcasses will be placed at random locations within areas being searched prior to the carcass search on the same day. Carcasses will be dropped from waist high or higher and allowed to land in a random posture. Each trial carcass will be discreetly marked prior to dropping so that it can be identified as a study carcass after it is found. The number and location of the detection carcasses found during the carcass search will be recorded. The number of carcasses available for detection during each trial will be determined immediately after the trial by the person responsible for distributing the carcasses.

5.3.3 Carcass Removal Trials

Carcass removal trials will be utilized to estimate the scavenger rate at the site. The objective of carcass removal trials is to estimate the likelihood that a carcass is removed by scavengers as a function of the time (measured in days) since the trial carcasses are placed in the field. Carcass removal includes removal by predation or scavenging, or removal by other means such as being plowed into a field. Estimates of carcass removal will be used to adjust the total number of carcasses found for those removed from the study area, correcting for removal bias.

Carcass removal trials will begin when carcass search studies begin. At least 25 bird carcasses will be used each season, along with at least 50 bat carcasses. Bird carcasses will consist of the same species as the searcher efficiency trials species. Carcasses will be placed on a minimum of two dates during each season, spreading the trials throughout the year to incorporate the effects of varying weather, climatic conditions, and scavenger densities.

All carcasses will be placed at random locations within the search area. Carcasses will be dropped from waist high or higher and allowed to land in a random posture. Each trial carcass will be discreetly marked prior to dropping so that it can be identified as a study carcass if it is found by other searchers or wind facility personnel.

Personnel conducting carcass searches will monitor the trial birds over a 30 day period according to the following schedule as closely as possible. Carcasses will be checked every day for the first 4 days, and then on day 7, day 10, day 14, day 20, and day 30. This schedule may vary depending on weather and coordination with the other survey work. Experimental carcasses will be left at the location until the end of the carcass removal trial. At the end of the 30-day period any evidence of the carcasses that remain will be removed.

Scavenger removal rates will be regularly checked to confirm that removal rates are not exceedingly short. If the removal time is very short, there are means to address this such that additional uncertainty is not added into the analysis unnecessarily. Ways to address very short removal times are to increase search frequency, put out carcasses at night if avian scavengers are suspected of removing carcasses (i.e., some avian predators that are active during the day may cue in on and remove carcasses immediately after placement), or possibly other options. The frequency of the standardized searches may be increased if carcass removal rates by scavengers are so high at the Project site that it precludes accurate bird and bat fatality estimates. For example, more frequent searches could be necessary if scavengers are removing a majority of carcasses from

the site within a few hours or days. Based on removal trials at other wind project sites in the region, this level of carcass scavenging is not anticipated.

5.3.4 Reporting

Mortality results will be compiled and reported quarterly in January, April, July, and October. Estimated mortality rates for birds and bats per turbine and per MW will be calculated based on the methods described above. These calculated mortality rates will be compared to mortality data from other wind facilities for similar projects. If a reasonable level of mortality is exceeded, adaptive management strategies will be identified and implemented. These results and analysis will be compiled in a report and provided to the USFWS and MNDNR for each year of mortality surveys. These reports will include copies of all data forms associated with mortality monitoring.

5.3.5 Post-construction Permitting Efforts

Required wildlife permits will be obtained for the Project from the USFWS and DNR for handling dead or injured birds protected by programs such as the MBTA, BGEPA, and state nest relocation permits. Temporary possession, depredation, and salvage permits issued by the USFWS under the BGEPA and MBTA and state salvage permits will be part of the post-construction monitoring efforts and each of these permits will be acquired before monitoring begins.

Once available, data compiled from currently ongoing preconstruction studies will be used to confirm the assumption that impacts to birds and bats are likely but will not be significant enough to affect area populations. These data will also be used to inform compliance with BGEPA, MBTA temporary possession, depredation, and salvage permits, and state salvage permitting requirements to monitor avian and bat mortality for up to two years post-construction.

The BGEPA and the ECPG (USFWS 2013) for wind development sites provides steps for voluntary compliance. Eagle use data will be collected over the course of an entire year at the Project. The results of these studies will be provided and discussed with the USFWS, as well as whether development of an Eagle Conservation Plan is appropriate for the Project. It is anticipated that the studies will satisfy the data requirements of the ECPG (USFWS 2013).

5.4 Quality Control and Adaptive Management

This ABPP includes mechanisms to review existing practices and ensure quality control. For instance, independent assessments of the avian reporting system may be conducted to ensure effectiveness, or there may be research on the effectiveness of different techniques and technologies used to prevent collisions, seasonal mortality, problem sites, areas where electrocutions occur on frequent or periodic basis, and problem nests.

With time, new methods to reduce and avoid negative impacts to avian and bat species may surface, and this plan may be amended to address issues and concerns utilizing those new methods. Further, data collected during operational monitoring may help to further inform wind farm environmental staff and wildlife agencies about the interplay of wind farms with avian species. Therefore, this plan will be reviewed and updated annually as needed to assist environmental staff in implementing the directives of the plan. This document will be maintained and made available at the operations facility for the Project.

The Project owners will consider adaptive management measures based on the results from formal monitoring. If results indicate that reevaluation is necessary, the effort will first focus on adherence to the operations, maintenance, and monitoring protocols described in this document. All human activities occurring on site will be reexamined to identify opportunities for improvement of study protocols and mitigation approaches.

As noted above, the Project will follow voluntary operation measures to minimize bat fatalities, including, when commercially feasible, committing to feathering turbine blades up to the manufacturer set cut-in speed at night during the fall bat migration season (August 1 – October 31) whenever evening temperatures exceed 50 degrees Fahrenheit. If avian and bat mortalities exceed an acceptable level of mortality, additional avoidance and minimization measures will be implemented to reduce the number of fatalities. Measures will be implemented in consultation with the USFWS and MNDNR. These measures might include

- procuring habitat conservation easements;
- improving wildlife habitat;
- installing nest boxes;
- additional training of wind farm staff;
- modifications to lighting, if lighting is contributing to mortality events;
- feathering of turbines, or other modifications to operations, to reduce mortality of birds or bats; the protocol will be based on scientifically based studies documenting effectiveness in reducing bird and/or bat mortality, and will allow for the continued economic viability of the project. It will be limited to the periods of higher risk based on factors including season, time of day/night, weather conditions, and individual turbines associated with higher mortality. The level of feathering will be commensurate with the level of mortality observed.
- installing more avian flight diverters along transmission line;
- implementing technology proven to decrease bird/bat mortality without affecting the financial viability of the project.

If adaptive management measures are put in place after the first year of post-construction monitoring and discussions with agencies determine a second year of surveys are recommended, the second year of post-construction monitoring will document the success of the avoidance and minimization measures. If adaptive management measures are put in place after the second year of post-construction monitoring, additional research will be conducted to document the success of the implemented avoidance and minimization measures. If the implemented measures successfully decrease mortality, they will be continued throughout the operational life of the project, unless alternative effective measures are identified and implemented.

If the implemented measures are not successful in reducing mortality below an acceptable level, additional avoidance and minimization measures will be discussed with the USFWS and MNDNR, and research will continue to document the success of these additional measures. If avoidance and minimization measures do not reduce mortality below reasonable levels, mitigation options will be considered. Possibilities for mitigation through funding various actions include the following:

- initiatives to protect, enhance or restore habitat for the impacted species;

- research on site or off site to improve wind facility design, and understanding of factors contributing to mortality;
- research that would increase biological understanding of impacted species;
- retrofitting of communication towers with bird flight diverters on guy lines, or improve the lighting so that it is less likely to attract birds; and/or
- offsite measures to increase nesting success, such as nesting platforms or nest boxes.

This list of mitigation measures is not exhaustive; these and additional mitigation measures appropriate to the impacted species will be discussed with the USFWS and MNDNR.

5.5 Key Resources

This ABPP identifies key resources to address avian protection issues including area USFWS and DNR biologists, engineers, planners, and operation personnel who have been trained on avian interaction problems. External organizations such as the National Wind Coordination Committee (NWCC) and APLIC can also serve as helpful resources by providing guidance, workshops, materials, and contacts. An understanding of bald eagles, marbled godwits, and bat behavior can influence how and when avian and bat protection should be utilized. The Project personnel will attempt to connect regulators and wildlife experts with Project decision-makers to reduce avian and bat injury or mortality and maintain Project reliability. The site manager will be responsible for enforcement of BMPs that focus on reducing impacts to birds and bats, as well as the implementation of this document. Operations and maintenance staff will be trained on this document and training on avian protection planning. Practices external to this document are highly encouraged by the Project personnel.

In the event of permit noncompliance issues during construction, the construction contractor will take the measures necessary to correct the situation and maintain compliance. A stop work order may be issued if an emergency occurs, or if a violation is not corrected in a reasonable timeframe. The contractor will designate a Project representative responsible for notifying and documenting issues of noncompliance with the permit.

Table 5 lists contacts that will serve as key resources during the construction and operations phases of both Projects. These include contacts for the Blazing Star II Wind Project, area biologists, rehabilitation centers, etc.

Table 5. List of Key Resources

Organization Type	Name	Address	Phone
Rehabilitation Center	The Raptor Center / College of Veterinary Medicine, University of Minnesota	1920 Fitch Avenue St. Paul, MN 55108	612.624.4745
Rehabilitation Center	Wildlife Science Center	5463 West Broadway Avenue Forest Lake, MN 55025	651.464.3993
Government Agency	Minnesota Dept. of Natural Resources	500 Lafayette Road St. Paul, MN 55155	651.296.5484
Government Agency	U.S. Fish & Wildlife Service	4101 American Boulevard East	612.725.3548

	Twin Cities Field Office	Bloomington, MN 55425	
Government Agency	Minnesota Department of Commerce / Energy Facility Permitting	85 7th Place East, Suite 500 St. Paul, MN 55101	800.657.3794
Developer	Blazing Star II Wind Farm, LLC	Address TBD – Operations & Maintenance Facility Building	TBD

6. AVOIDANCE, MINIMIZATION AND ADAPTIVE MANAGEMENT

As discussed above, the Project has incorporated Tier 1 through 3 information in the siting process to avoid and minimize potential impacts to wildlife. Siting decisions will also incorporate comments from agencies. Avoidance and minimization measures that have already occurred or are being considered are described further in Table 6 below.

Within the WEG, the Department of the Interior defines adaptive management as "an iterative decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Comprehensively applying the tiered approach embodies the adaptive management process" (USFWS 2012). The WEG further notes that adaptive management at most wind facilities is unlikely to be needed during operation if they are sited in accordance with the tiered approach. Nevertheless, Blazing Star II recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, Blazing Star II has incorporated an adaptive approach for the conservation of wildlife potentially impacted by the Project. Table 6 below summarizes the adaptive management measures currently under consideration.

Table 6. Summary of Avoidance, Minimization and Adaptive Management Measures

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			**Level 2**	**Level 3**
Birds				
1. All electrical collection lines and redundant telecommunications lines will be co-located and buried underground to the extent practicable. This measure minimizes habitat loss, perch sites, collision risk, and electrocution risk for birds.	1. Disturbance to habitat will be minimized during construction. Equipment and vehicle travel will be limited to existing roads or specific construction pathways during construction. Construction traffic, parking, and laydown areas will occur within previously disturbed lands to the extent feasible. Disturbed soil, if not replanted in agriculture, will be reclaimed with weed-free native grass, forbs,	1. Nighttime lighting will be minimized at the Project by: a) installing motion activated timed lighting on tower entrances and other facilities b) installing downward projecting lights to minimize visibility of the lights beyond the building, c) turbine lighting in accordance with FAA minimum requirements, and d) extinguishing work	1.Trigger: Mass casualty event (5 or more carcasses documented at the facility a five day period). In coordination with MNDNR and USFWS, evaluate monitoring data to determine whether the data are indicative of a pattern of fatalities at the Project that should be addressed through additional	

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			**Level 2**	**Level 3**
	and shrubs. This measure minimizes habitat loss for birds.	lights in turbine nacelles at night Minimizing the night time lighting at this site will minimize mortality of nocturnal migrant birds by reducing attractants.	measures. This measure is intended to identify unanticipated impacts and focus responses appropriately.	
2. Turbine lighting will utilize current FAA recommendations for turbine lighting of red strobes at night with long off intervals. This measure minimizes attractants to nocturnal birds	2. All trash and food-related waste will be placed in self-closing containers and removed daily from the site. This measure reduces the attractiveness of the Project to avian scavengers.	2. Staff will be trained to identify anthropomorphic sources of avian attractants including rock piles, compost sites and potential roost sources and will work with the landowners to remove or reduce attractants within 500 feet of wind turbines, project substation, and meteorological towers.	2. Trigger: Mass casualty event (5 or more carcasses documented at the facility a five day period). In coordination with MNDNR and USFWS, identify practicable measures to address the impact and minimize fatalities. This measure is intended to focus the response appropriately to address the impact.	2. Trigger: Continued documentation of mass casualty after Level 2 evaluation has occurred. Conduct studies to test additional ways to reduce avian fatalities from wind turbines and implement tested measures that prove to be effective. This measure would help determine effective strategies to minimize further impacts.
3. Location of collection lines in forested habitats will be avoided to the greatest extent possible, but if any lines need to be placed in these habitats, surface disturbance will be avoided by directional boring under them from adjacent areas. This measure minimizes loss of forested areas that may provide nesting habitat for birds.	3. Vehicular speed will be limited to 25 miles per hour (40 km per hour) on Project roads. This measure minimizes the risk of wildlife collisions with vehicles and reduces the occurrence of carcasses that may attract avian scavengers to the Project.	3. "Good housekeeping" procedures will be developed to keep the site clean of debris, garbage, carrion, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards. This will prevent trash from being exposed or blown around the Project area. This will minimize the attraction of raptors or avian scavengers to the Project. This will also minimize the attraction of mammalian scavengers that may interfere with monitoring.	3. Trigger: Mass casualty event (5 or more carcasses documented at the facility a five day period). Initiate an investigation of and report any mass casualty event. Coordinate with MNDNR and USFWS to determine corrective actions, to the extent possible, to ensure long term solutions are implemented for the life of the Project. For example, if there are unanticipated waterfowl fatalities, assess whether radar-controlled informed	3.Trigger: continued casualty events after evaluation and corrective actions in Level 2 have been implemented. Expand removal of roadside carcasses to a buffer around the Project that does not overlap with similar buffers for other nearby projects, by surveying for carcasses and notifying local officials of carcass presence. This will minimize attraction of raptors and other avian scavengers to the vicinity of the Project.

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			Level 2	Level 3
			curtailment can be practicably implemented during daytime when waterfowl are active. This measure is intended to focus the response appropriately to address the impact.	
4. A separation distance between individual wind turbines of approximately 1,000 feet will be maintained to minimize turbulence effects. This will allow ample space for birds to fly between the turbines and avoid hazardous areas. This measure reduces collision risk for birds.	4. The number of storm water control features (sediment retention ponds) near turbines will be minimized by eliminating any such features that are unnecessary. This measure minimizes on-site attractants to birds.	4. Road-killed animals or other carcasses (excluding bald eagles and other migratory birds) detected by personnel on or near roads within the Final Project area will be removed promptly. This measure minimizes the attraction of raptors and other avian scavengers to the Project.	4. Trigger: fatality rates of birds are higher than anticipated and a potential risk to populations is identified from the project. Coordination with the DNR and USFWS will occur, to discuss whether the additional on-site measures do not appear to be effective at reducing fatalities. Voluntary donations to organizations that promote the conservation of affected avian species may be made. These organizations will be identified in coordination with the USFWS to ensure the maximum conservation benefit. This measure supports the long-term conservation of the affected species.	
5. Utility lines will be designed following APLIC (2006, 2012) guidelines to prevent electrocution and collision. This measure	5. A site-specific worker environmental training program will be developed and implemented throughout the construction of the	5. Vehicular speed will be limited to 25 miles per hour (40 km per hour) on Project roads. This measure minimizes the risk of collision with		

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			Level 2	Level 3
reduces the risks of collision and electrocution for birds.	Project. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training will include information regarding the sensitive biological resources, restrictions, protection measures (including minimizing light pollution), individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation. This measure minimizes disturbance of wildlife by the Project and increases the effectiveness of all construction measures for birds by ensuring that workers are aware of these measures and the means to implement them.	vehicles and reduces the occurrence of carcasses that may attract avian scavengers to the Project.		
6. Turbines will use monopole instead of lattice tower design, to minimize opportunities for perching and nesting. This measure minimizes risks of electrocution and collision for raptors and other birds.	6. Areas of native vegetation will be marked to highlight their location to construction crews in order to minimize disturbance in those areas. This measure reduces loss of habitat that may provide nesting and roosting opportunities for birds.	6. APLIC guidelines will be followed for marking of any above-ground transmission lines under the Project owner's control. This measure minimizes the risk of avian collisions.		
7. Any new transmission line for the Project will be marked with bird diverters, if acceptable to the power off-taker	7. Potential roost trees and nesting sites will be protected by retaining mature trees wherever possible. This measure	7. Maintenance during operations will prioritize tree trimming over tree removal, all tree trimming will occur in		

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			Level 2	Level 3
or owner. This measure will minimize the potential for bird collisions with the lines.	minimizes disturbance and habitat loss by protecting nesting and roosting sites for birds.	such a manner as to avoid impacting nesting migrating birds and roosting bats.		
8. Permanent met towers will be free-standing to avoid the collision risk associated with guy wires. Met towers will not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities are present. Installation of towers will be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors. This measure minimizes collision risk and disturbance of breeding areas and loss of habitat for nesting by birds.	8. Best Management Practices (BMPs) for fire prevention during construction will be implemented to minimize wildfire potential. This measure minimizes loss of habitat for nesting, roosting and foraging by birds.	8. A site-specific worker environmental training plan will be developed and implemented throughout the Project operating life and will include the importance of minimizing light pollution. All employees and contractors working in the field will be required to attend the environmental training session prior to working on site. This training will include information regarding the sensitive biological resources, restrictions, protection measures (including minimizing light pollution), individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation. This measure minimizes collision risks and disturbance of birds ensuring that workers are aware of these measures and the means to implement them.		
9. Construction footprints and surface disturbance areas will be minimized. An erosion control protocol will be developed to	9. Any use of pesticides, herbicides, fertilizers, and other chemicals will be in accordance with federal and state laws. An integrated pest	9. Avian and bat fatalities will be evaluated during standardized post-construction fatality monitoring for two years		

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			**Level 2**	**Level 3**
treat disturbed and exposed soil surfaces and prevent contamination of natural water resources. This measure minimizes loss of habitat that may provide nesting or roosting opportunities for birds.	management plan will be developed to ensure that applications will use only Environmental Protection Agency registered pesticides. Pesticide use will be limited to non-persistent, immobile pesticides and will only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. This measure reduces the risk of poisoning fatalities of wildlife, thereby reducing the potential occurrence of carcasses that attract avian scavengers.	following construction. Follow-up monitoring will be conducted at 5-year intervals thereafter, beginning in year 5 of operations. This measure ensures measurement of project impacts to inform adaptive management.		
10. No turbines will be located within 3RD of the Lake Hendricks to minimize impacts to eagles and migrants. This measure minimizes impacts to birds.		10. The Project will use the minimum number of aviation hazard lights acceptable to the FAA. Although it has not been demonstrated to reduce avian impacts, this measure may potentially reduce avian collisions by reducing attractants.		
		11. BMPs for fire prevention during operation will be implemented to minimize wildfire potential. This measure minimizes habitat loss for nesting birds.		
		12. Firearms and pets will be prohibited from the Project and workers will be instructed to avoid disturbing or harassing wildlife. This measure minimizes the risk of disturbance of birds at the Project.		
Bats				
1. All electrical	1. Disturbance to habitat	1. Nighttime lighting will	1. Trigger: fatality	1.Trigger: Continued

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			Level 2	Level 3
collection lines and redundant telecommunications lines will be co-located and buried underground to the extent practicable. This measure minimizes habitat loss, collision risk, and electrocution risk for bats.	will be minimized during construction. Equipment and vehicle travel will be limited to existing roads or specific construction pathways during construction. Construction traffic, parking, and laydown areas will occur within previously disturbed lands to the extent feasible. Disturbed soil, if not replanted in agriculture, will be reclaimed with weed-free native grass, forbs, and shrubs. This measure minimizes habitat loss for bats.	be minimized at the Project by: a) installing motion activated timed lighting on tower entrances and other facilities b) installing downward projecting lights to minimize visibility of the lights beyond the building, and c) extinguishing work lights in turbine nacelles at night Minimizing the night time lighting at this site will minimize mortality of bats by reducing attractiveness to insects and foraging bats.	rates of bats are higher than anticipated and a potential risk to populations is identified from the project. Coordination with the DNR will occur, to discuss whether turbines will be curtailed beyond the feathering described in Measure 2 below (either beyond August 1 – October 31, or at a higher cut-in speed).	higher than anticipated fatality rates after Level 2 is implemented. In coordination with MNDNR and USFWS, evaluate data to assess whether any additional practicable changes in curtailment strategy can be implemented to reduce collisions. This measure would attempt to reduce future fatalities at the Project.
2. Location of collection lines in forested habitats will be avoided to the greatest extent possible, but if any lines need to be placed in these habitats, surface disturbance will be avoided by directional boring under them from adjacent areas. This measure minimizes loss of forested areas that may provide roosting habitat for bats.	2. A site-specific worker environmental training program will be developed and implemented throughout the construction of the Project. All employees and contractors working in the field will be required to attend the environmental training session prior to working on-site. This training will include information regarding the sensitive biological resources, restrictions, protection measures (including minimizing light pollution), individual responsibilities associated with the Project, and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation. This	2. Feathering of wind turbine blades below the manufacturer's normal operational wind cut-in speed during the fall migration season (August 1 – October 31), whenever the temperature is above 50 degrees Fahrenheit or higher. Feathering, which occurs when wind turbine blades are pitched parallel to the wind so that rotor tip speed is 50 mph or less (rotation of the rotor is less than 1-3 rotations per minute, depending on blade length) is a method usually shown to significantly reduce the level of bat fatalities.	2. Trigger: Mass casualty event (5 or more carcasses documented at the facility a five day period). In coordination with MNDNR and USFWS evaluate data to determine whether the data are indicative of a pattern of fatalities at the Project that should be addressed through additional measures. This measure is intended to identify unanticipated impacts and focus responses appropriately.	2. Trigger: continued casualty events after evaluation and corrective actions in Level 2 have been implemented. Implement an additional measure to reduce fatalities that was identified during Tier 2 evaluation process (Measure 2) to reduce fatalities at the Project.

Project Planning/Design Phase	Construction Phase	Operations Phase	Adaptive Management	
Level 1 – Avoidance and Minimization Measures			Level 2	Level 3
	measure minimizes disturbance of wildlife by the Project and increases the effectiveness of all construction measures for bats by ensuring that workers are aware of these measures and the means to implement them.			
3. Construction footprints and surface disturbance areas will be minimized. An erosion control protocol will be developed to treat disturbed and exposed soil surfaces and prevent contamination of natural water resources. This measure minimizes loss of habitat for birds.	3. Potential roost trees and nesting sites will be protected by retaining mature trees. This measure minimizes disturbance and habitat loss by protecting roosting sites for bats.	3. Firearms and pets will be prohibited from the Project and workers will be instructed to avoid disturbing or harassing wildlife. This measure minimizes the risk of disturbance of bats at the Project.	3. Trigger: a bat species listed under the ESA is detected as a fatality at the Project. Seek an Incidental Take Permit if the take is not covered by a 4(d) rule.	3. Trigger: continued take of listed species beyond the rate anticipated or covered by the Incidental Take Permit. If the additional on-site measures do not appear to be effective at reducing fatalities, make voluntary donations to organizations that promote the conservation of affected bat species. This measure supports the long-term conservation of the affected species.
	4. BMPs for fire prevention during construction will be implemented to minimize wildfire potential. This measure minimizes loss of habitat for roosting and foraging by bats.	4. The number of storm water control features (sediment retention ponds) near turbines will be minimized by eliminating any such features that are unnecessary. This measure minimizes on-site attractants to foraging bats.	4. Trigger: new bat species is listed under the ESA. Meet and confer with USFWS if new bat species are listed under ESA to determine if changes to the turbine operation plan are warranted based on results of monitoring at the Project.	

7. SUMMARY

Table 7 below summarizes the main steps that have been or will be taken to avoid, minimize and mitigate Project impacts on wildlife species. This table will be updated during the construction and operations phase of the Project.

Table 7. Summary of ABPP Components

ABPP Component	Phase	Project Action	Status and Notes
Risk Assessment	Preconstruction	Assess available data addressing areas of high avian/bat use, avian/bat mortality, nesting problems, established flyways, adjacent wetlands, prey populations, perch availability, evidence of perching on utility structures by large birds, effectiveness of existing procedures, institute remedial actions and other factors that can reduce avian and bat contacts with Project facilities.	Evaluation largely completed; Tier 1 and 2 studies.
Permit Compliance	Preconstruction	Ensure compliance with siting and preconstruction regulations such as WTGAC, ESA, BGEPA, MBTA and state requirements. Obtain salvage, monitoring, recovery, and transportation permits for post construction operations	Tier 3 studies underway,. Have identified contacts and salvage permit requirements for post-construction monitoring.
S Design Standards	Preconstruction	Minimize the areas of construction and temporary ground-disturbance activities, incorporate avian and bat-safe structures and protocols.	Institute siting designs that avoid high use flight paths between WMA's and WPA's on the site, and other high-use areas.
Training	Construction and Operation	Train appropriate personnel, including managers, supervisors, engineers, wildlife biologists, dispatchers, and operations and maintenance personnel in avian and bat issues related to wind farm operation.	
Nest Management	Construction and Operation	Train appropriate personnel to ensure uniform treatment of avian nest issues and procedures.	
Wildlife Incident Reporting	Construction and Operation	Institute Wildlife Incident Reporting procedures and maintain database for quarterly reporting to regulating agencies.	Developed Wildlife Incident Reporting forms and procedures to monitor wildlife interaction.
Quality Control	Construction and Operation	Review existing practices and ensure quality control. Update this plan annually	

ABPP Component	Phase	Project Action	Status and Notes
Key Resources	Construction and Operation	Identify area USFWS and MNDNR biologists, engineers, planners, and operation personnel who are trained in avian interaction problems.	Identified agency personnel and rehabilitation centers for injured wildlife.
Mortality Reduction Measures	Operation	Identify retrofit or rectification efforts, and where new construction warrants, pay special attention to bald eagles, bats, and other wildlife issues where mortality or injuries are being documented.	

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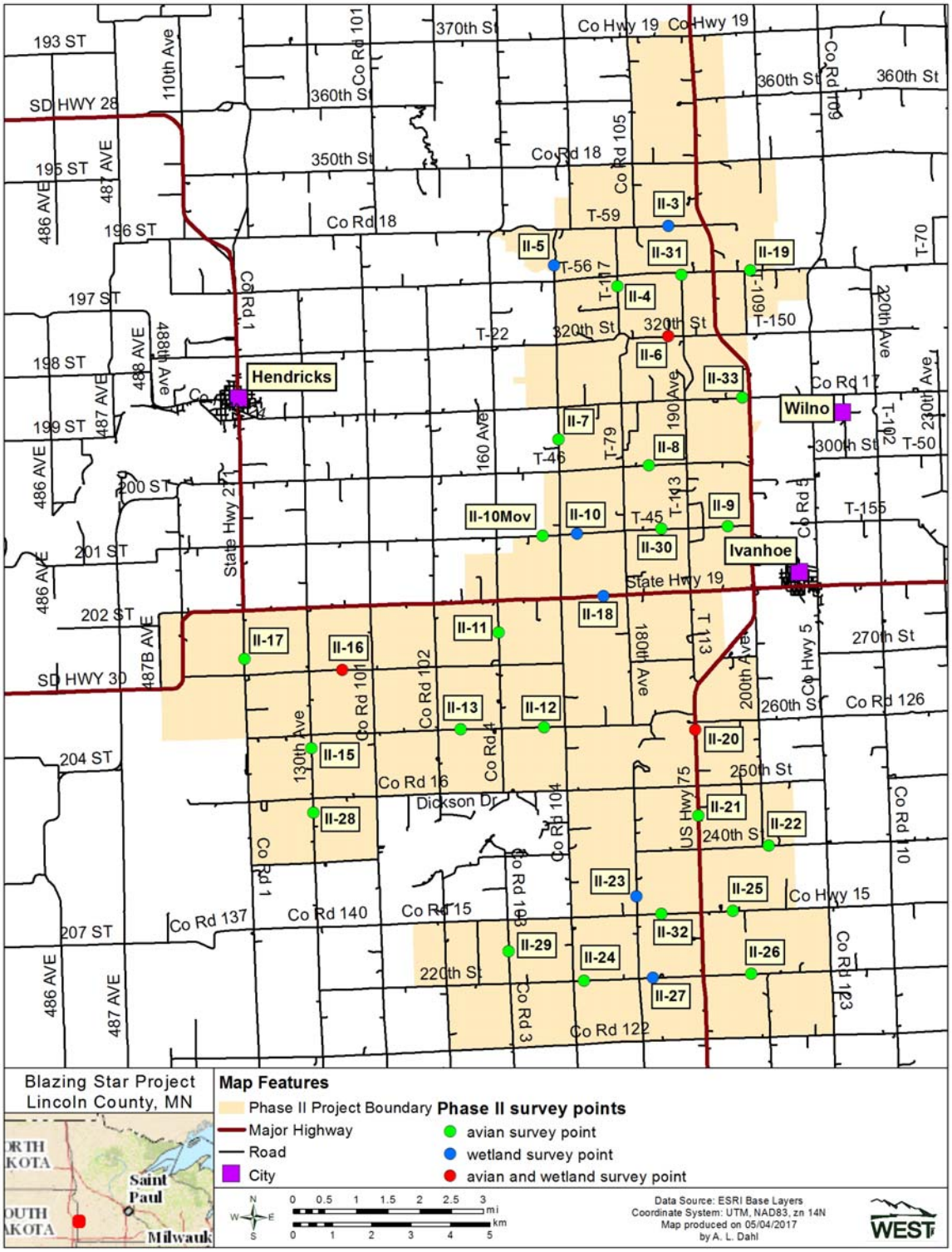
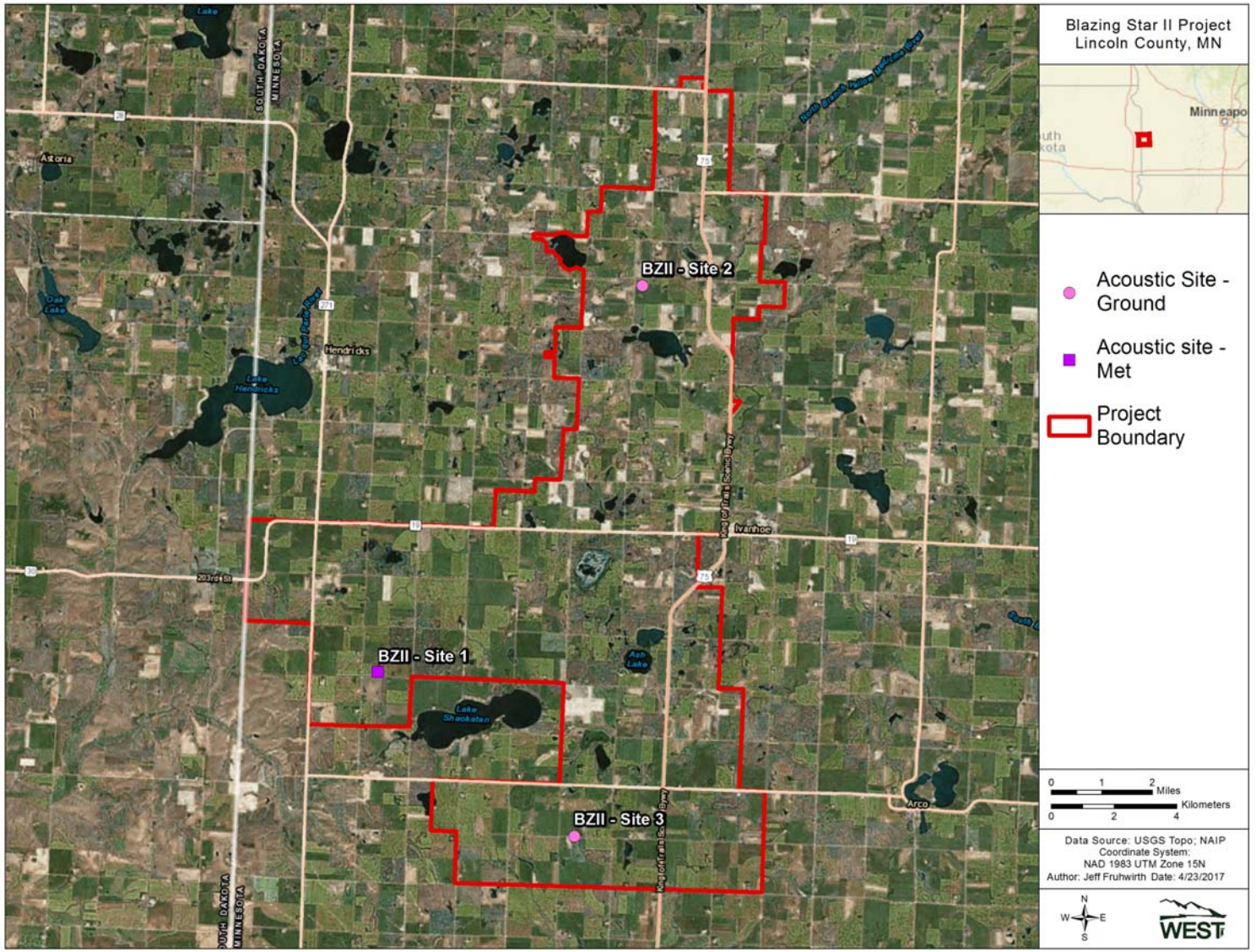


Map Exhibit 1. Blazing Star II Wind Farm with Avian and Wetland Use Survey Locations


Blazing Star II Project
Lincoln County, MN
Minneapo
Acoustic Site - Ground
Acoustic site - Met
Project Boundary
BZII - Site 1
BZII - Site 2
BZII - Site 3
Astoria
Hendricks
Ivanhoe
Arco
Lake Shaokatan
Ash Lake
Oak Lake
Lake Hendricks
203rd St
SOUTH DAKOTA
MINNESOTA
0 1 2 Miles
0 2 4 Kilometers
Data Source: USGS Topo; NAIP
Coordinate System:
NAD 1983 UTM Zone 15N
Author: Jeff Fruhwirth Date: 4/23/2017
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Map Exhibit 2. Blazing Star II Wind Farm with Bat Acoustic Survey Locations