Appendix H
Draft Bird and Bat Conservation Strategy

Bitter Root Wind Energy Project
Bird and Bat Conservation Strategy

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1 INTRODUCTION

Flying Cow Wind, LLC (the Company), has proposed development of the Bitter Root Wind Energy Project (Project) in Yellow Medicine County, MN, and Deuel County, SD (Figure 1). Project turbines are planned only in Yellow Medicine County, MN, but the substation and transmission line will be located in Deuel County, SD. Therefore wildlife and regulatory data are included for both states. Throughout the development process, the Company has taken steps to minimize impacts to birds, bats, and other natural resources, following the U.S. Fish and Wildlife Service's (USFWS) *Land-based Wind Energy Guidelines* (WEG; USFWS 2012), *Eagle Conservation Plan Guidance* (ECPG; USFWS 2013), and state guidance received during the permit process for Large Wind Energy Conversion Systems (LWECS).

The primary objectives of this document are to:

- document the steps taken to avoid and minimize impacts to natural resources during planning and development;
- identify and implement steps to further reduce the potential for adverse effects on birds and bats near the Project area; and
- facilitate improved coordination between the Company and both state and federal wildlife agencies.

This document fulfills (1) the requirement that a Bird and Bat Conservation Strategy (BBCS, formerly referred to as Avian and Bat Protection Plan) be developed in coordination with the Minnesota Department of Commerce (MNDOC) – Energy Environmental Review and Analysis and other appropriate agencies and (2) the recommendation in the WEG to complete a BBCS and post-construction fatality monitoring plan.

1.1 Description of the Project Area

The Project is located within both the Prairie Coteau and Prairie Coteau Escarpment Level IV ecoregions, which are within the Northern Glaciated Plains Level V Ecoregion (U.S. Environmental Protection Agency [USEPA] 2016). The Prairie Coteau Ecoregion is characterized by closely-spaced, semi-permanent or seasonal wetlands and includes several large lakes and bur oak woodlands. The Prairie Coteau Escarpment Ecoregion is characterized by dense deciduous riparian areas ranging from 91 to 183 m (300 to 600 ft), between the Minnesota River Valley and the Prairie Coteau Ecoregion.

The Project area has been modified in the development process (Figure 2). Currently, the proposed Project area includes 9,206 hectares (ha; 22,750 acres), with three primary land cover types: cultivated crops (46.6%), hay/pasture (26.3%), and herbaceous (17.7%). Approximately 3.6% of the area is developed, while the remaining area consists of open water, emergent herbaceous wetlands, deciduous forest, shrub/scrub, woody wetlands, and barren land (Table 1, Figure 3).

Table 1. 2011 National Land Cover Database land cover types located within the Bitter Root Project area (NLCD 2011; Homer et al. 2015).

Cover Type	Hectares	Acres	Percent
Cultivated Crops	4,289	10,600	46.6
Hay/Pasture	2,419	5,979	26.3
Herbaceous	1,625	4,016	17.7
Developed, Open Space	321	793	3.5
Emergent Herbaceous Wetlands	217	537	2.4
Open Water	189	468	2.1
Deciduous Forest	124	307	1.3
Woody Wetlands	10	25	0.1
Developed, Low Intensity	4	11	<0.1
Shrub/Scrub	3	7	<0.1
Barren Land	2	6	<0.1
Developed, Medium Intensity	<1	1	<0.1
Developed, High Intensity	<1	0	<0.1
Total	**9,206**	**22,750**	**100**

1.2 Description of the Project Layout

The proposed Project is up to a 152 megawatt (MW) LWECS, with 37 turbine locations planned in Yellow Medicine County, MN (Figure 4). Three alternate turbine locations are also included in the Project layout. A Project substation and overhead transmission line will be located in Deuel County, SD. The current layout includes 30 Vestas V136-4.2 MW turbines and 10 Vestas V136-3.45 MW turbines. Some of these locations are alternative locations, and it is anticipated that no more than 37 locations will be constructed. Construction in Minnesota is expected to begin in late 2018.

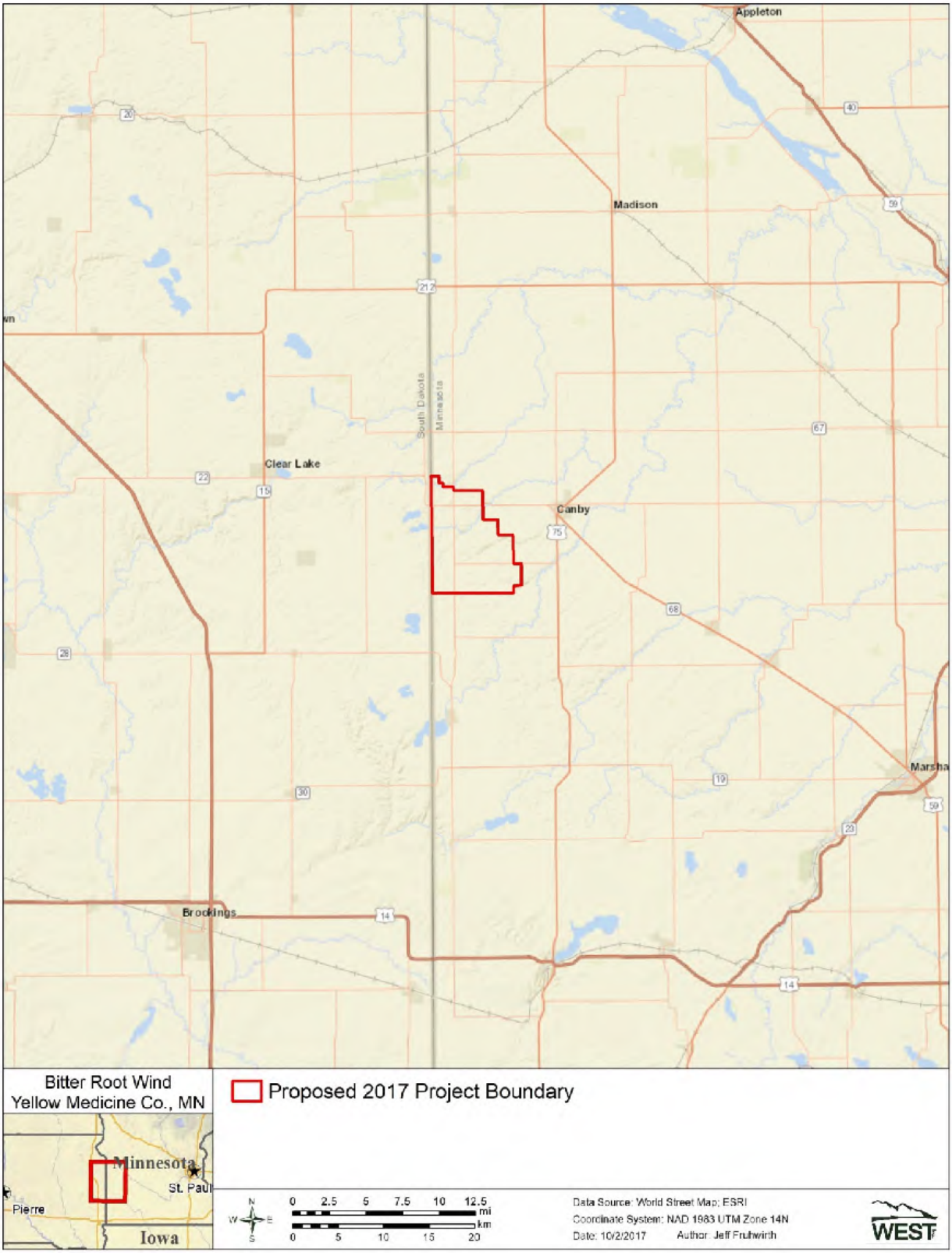

Figure 1. Location of the proposed Bitter Root Wind Energy Project area in Yellow Medicine County, MN.

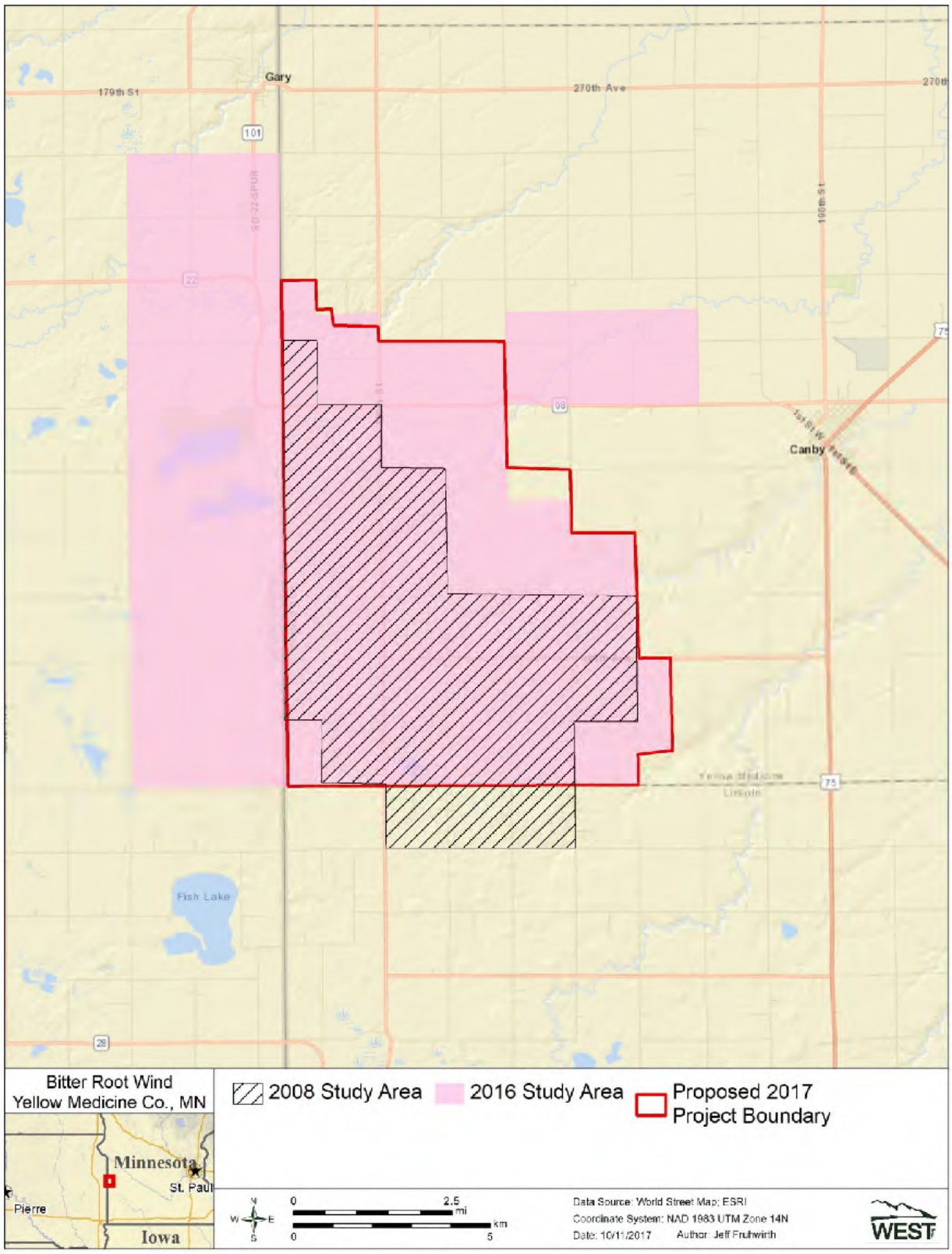

Figure 2. The proposed Bitter Root Project area relative to the 2008 and 2016 Bitter Root study areas.

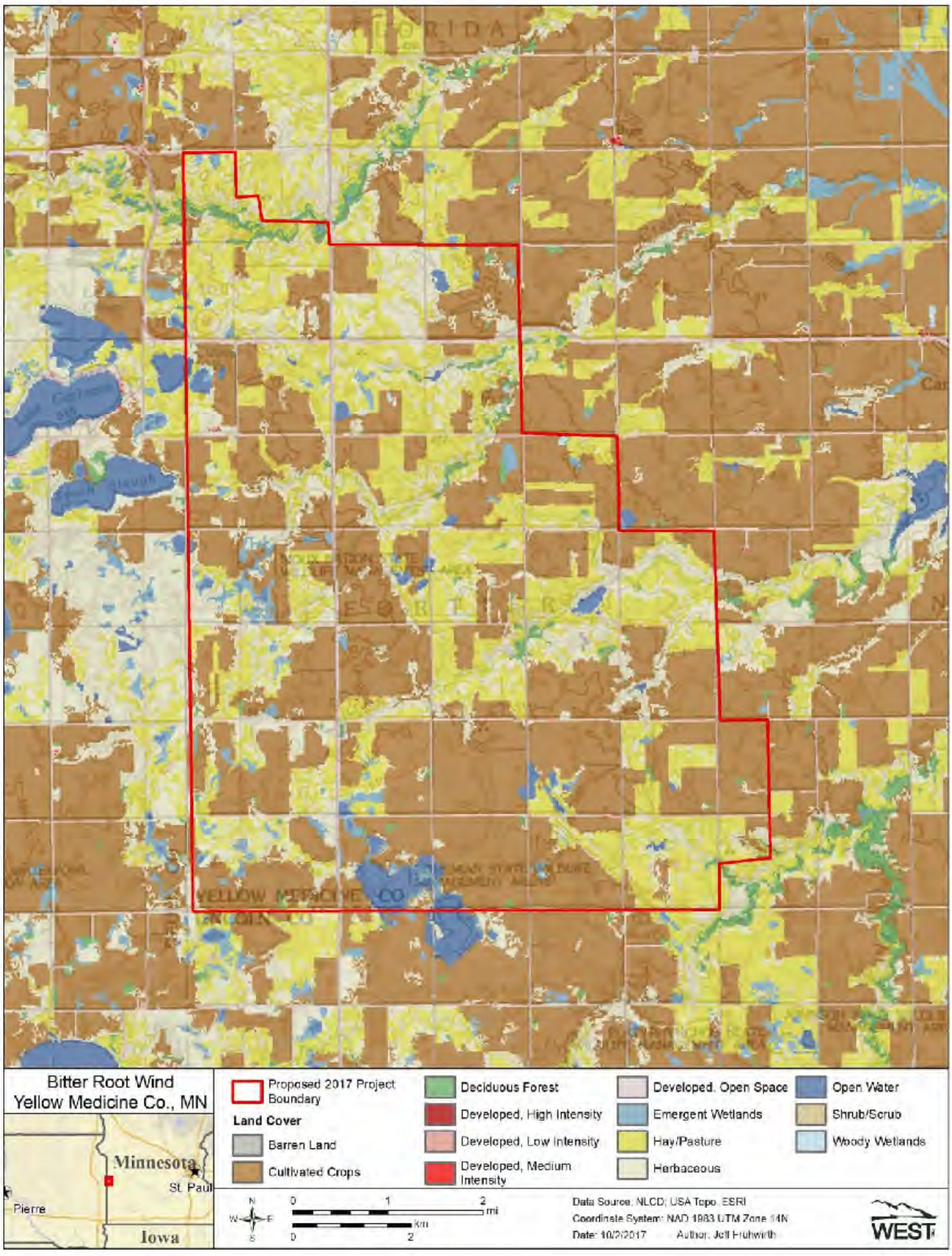

Figure 3. Land cover within and adjacent to the proposed Bitter Root Energy Project area.

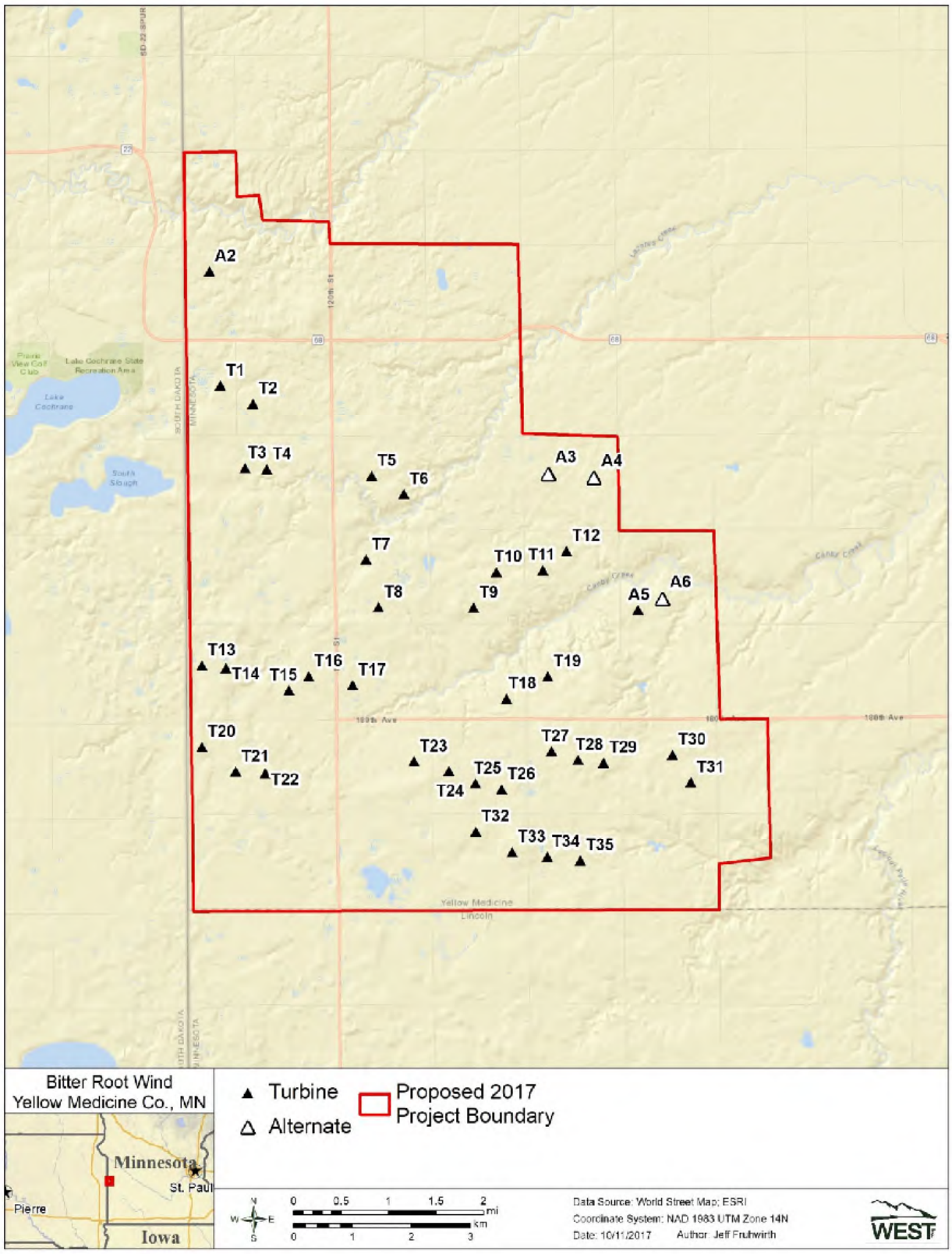

Figure 4. Proposed turbine layout within the Bitter Root Wind Energy Project area in Yellow Medicine County, MN.

1.3 Key Avian and Bat Regulations

1.3.1 Federal Endangered Species Act

Species at risk of extinction or significant decline, including many birds and bats, are protected under the federal Endangered Species Act (ESA) of 1973, as amended. The ESA designates at-risk species as either "endangered" or "threatened" and provides regulatory protection for each listed species. The ESA provides a program for conservation and recovery of threatened and endangered species. Section 9 of the ESA prohibits the "take" of species listed by the USFWS as threatened or endangered. Take is defined by the ESA as follows: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct". The ESA includes provisions for the authorization of take that is incidental to, but not the purpose of, otherwise lawful activities (Sec 10.a). Incidental Take Permits may be issued if take is truly incidental and does not jeopardize the survival or recovery of the species (Sec.10.a.1.b).

1.3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess any migratory bird, including the parts (e.g. feathers or talons), nests, or eggs of any bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and Russia (and other countries of the former Soviet Union; MBTA 1918). Most bird species (except for introduced species and non-migratory game species) within the Project area are protected under the MBTA. Due to the potential for migratory birds within the Project area, compliance with the MBTA has been considered in the development of this BBCS. No permits are available to authorize incidental take of birds under the MBTA.

1.3.3 Bald and Golden Eagle Protection Act

The USFWS's Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 USC 668–668c, as amended) was enacted to protect bald and golden eagles, as well as their nests and eggs. 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 body part, nest or egg without a valid permit to do so (BGEPA 1940). 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 2007a).

In 2009, the USFWS issued a final rule on new permit regulations that would allow some disturbance of eagles "in the course of conducting lawful activities" (74 FR 46836–46879). The USFWS's description of its 2009 rule suggests that recurring, incidental take of eagles will only be authorized if every avoidance measure has been exhausted. Generally, the removal of nests will be permitted only in cases where the nest poses a threat to human health or where the

removal would protect eagles. Take permits may be issued when "necessary for the protection of…other interests in any particular locality" (USFWS 2009). This discussion expands the definition of such public and private interests to include utility infrastructure development and maintenance. The Federal Register states that due to concerns about population declines, permits for take of golden eagles are likely to be restricted throughout the eagle's range (FR online: Volume 81, Number 242 [Friday, December 16, 2016]). Considerations for issuing take permits include the health of the local and regional eagle populations, availability of suitable nesting and foraging habitat for any displaced eagles, and whether the take and associated mitigation provides a net benefit to eagles (74 FR 46836–46879, USFWS 2009). In April 2013, the USFWS issued the *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy Version 2* to address these new regulatory matters (USFWS 2013).

On December 16, 2016, the USFWS issued a rule that includes final revisions to the regulations for eagle take permits and eagle nest take permits. The changes went into effect on January 17, 2017, and included changes to permit issuance criteria, duration (allowing a 30-year permit term), compensatory mitigation standards, and permit application requirements and codifies and further defines the USFWS-approved protocols for pre-construction eagle use surveys (referencing the ECPG) and post-permit fatality monitoring requirements.

1.3.4 Minnesota Threatened and Endangered Species Laws

The 2010 Minnesota Statutes, specifically the Protection of Threatened and Endangered Species (Minn. Stat. 84.0895), includes the language "Notwithstanding any other law, a person may not take, import, transport, or sell any portion of an endangered species of wild animal or plant, or sell or possess with intent to sell an article made with any part of the skin, hide, or parts of an endangered species of wild animal or plant, except as provided in subdivisions 2 and 7." The statute directs the Minnesota DNR Commissioner to develop lists of endangered species, threatened species, and species of concern. Minn. Rules, Part 6212.1800 allows for issuance of a taking permit for threatened and endangered species in situations that meet certain criteria.

1.3.5 South Dakota Threatened and Endangered Species Laws

The Game, Fish, and Parks Commission of South Dakota is responsible for identifying species determined to be threatened or endangered within the state. The Department of Game, Fish, and Parks and the Department of Agriculture are responsible for managing, protecting, and restoring endangered and threatened species in South Dakota. Chapter 34A-8-9 states "no person may take, possess, transport, import, export, process, sell, or offer for sale, buy or offer to buy, nor may a common or contract carrier transport or receive for shipment, any species of wildlife or plants appearing on the following lists:

1. The list of wildlife and plants indigenous to the state determined to be endangered or threatened within the state pursuant to §§ 34A-8-3 and 34A-8-4.
2. The United States list of endangered or threatened native wildlife effective on January 1, 1977.

3. The United States list of endangered or threatened foreign wildlife effective on January 1, 1977.
4. The United States list of endangered or threatened plants effective on January 1, 1977.

A violation of this section is a Class 2 misdemeanor."

2 PRE-CONSTRUCTION: TIER 1-3 SUMMARY

The WEG outlines a tiered approach to assessing suitability and risks to wildlife at potential wind resource areas. The tiered approach ensures that sufficient data are collected to enable project proponents to make informed decisions about the continued development of a proposed project (USFWS 2012). At each tier, potential issues associated with the development or operations of the project are identified and questions are formulated to guide decision making. This process starts with a broad scope and provides more site-specific detail at each tier as more data are gathered and the potential for avian and bat issues are better understood. The sections below briefly describe the efforts completed as part of Tiers 1-3 of the WEG.

2.1 Tiers 1 and 2 – Preliminary Site Evaluation and Site Characterization

Tiers 1 and 2 evaluate potential issues that may need to be addressed before further actions can be taken with the development or operations of the Project. The objective of the Tier 1 study is to assist the developer in further identifying a potential wind site. Tier 1 studies involve a preliminary screening of public data from federal, state, and tribal entities and offer early guidance about the sensitivity of flora and fauna near the site. Tier 2 studies determine potential effects of the proposed Project on any federal or state-listed sensitive species. Tier 2 studies typically include a more thorough review of existing information, including publicly available data on land use/land cover, wildlife habitats, and plant distribution. A reconnaissance-level site visit and initial contact with the appropriate agencies is also involved.

As part of the Tier 1-2 evaluation completed for the Project, detailed desktop reviews and preliminary on-site evaluations were conducted by a qualified biologist and Project team members. These assessments were completed to determine if sensitive environmental areas or other environmental issues would be detrimental to the Project (i.e., fatal flaws). This review included analysis of locations and habitat capable of supporting listed species, areas of significant biodiversity, forested and wetland areas, and area designated as important by federal or state agencies (e.g., Wildlife Management Areas) or other conservation organizations (e.g., Important Bird Areas designated by the National Audubon Society). Table 2 lists natural resources of concern near the Project area, provided by the Minnesota Natural Heritage Information System. The Tier 1-2 evaluation indicated that the general landscape is dominated by cultivated agricultural lands, pasture, and hayfields. However, the evaluation also noted the presence of valuable wildlife habitat in and near the Project area, including native prairie, lakes, wetlands (including calcareous fens), woodlands, and riparian corridors. These areas included a series of parcels identified during the Minnesota County Biological Survey as being of high or moderate biodiversity significance.

While the site included a series of habitats that should be carefully considered in the Project development process, the Tier 1-2 review did not identify any environmentally-based fatal flaws that would preclude operation of a wind energy facility in the area. However, a series of more detailed Tier 3 wildlife studies was necessary to more thoroughly evaluate potential development of the Project site.

Table 2. Natural resources of concern near the proposed Project area[1], provided by the Minnesota Natural Heritage Information System.

Species/Habitats	Scientific Name
Birds	
Short-eared owl	*Asio flammeus*
Upland sandpiper	*Bartramia longicauda*
American bittern	*Botaurus lentiginosus*
Acadian flycatcher	*Empidonax virescens*
Marbled godwit	*Limosa fedoa*
Mammals	
Richardson's ground squirrel	*Urocitellus richardsonii*
Prairie vole	*Microtus ochrogaster*
Invertebrates	
Dakota skipper	*Hesperia dacotae*
Pawnee skipper	*Hesperia leonardus*
Poweshiek skipperling	*Oarisma poweshiek*
Regal fritillary	*Speyeria idalia*
Iowa skipper	*Atrytone arogos iowa*
Vascular Plants	
Slender milk-vetch	*Astragalus flexuosus*
Missouri milk-vetch	*Astragalus missouriensis*
Yellow-fruited sedge	*Carex annectens*
Small white lady's-slipper	*Cypripedium candidum*
Western white prairie clover	*Dalea candida*
Hair-like beak rush	*Rhynchospora capillacea*
Yellow prairie violet	*Viola nuttallii*
Habitats	
Calcareous fen	
Dry hill prairie	
Wet prairie	

[1] Based on the area within one mile of the 2016 study area, which encompassed most of the currently proposed Project area as well as surrounding land in Deuel County, SD (Figure 2).

2.2 Tier 3 – Baseline Survey Results Review

Baseline (Tier 3) wildlife studies were conducted to further assess potential environmental impacts of Project development and operation. Tier 3 studies were designed using methods consistent with the WEG recommendations, as well as guidelines from the MNDNR and MNDOC. In general, the results of the Tier 3 studies indicated wildlife use similar to many other wind energy sites in the region, but suggested minimizing impacts to select areas (e.g., grasslands, riparian corridors) to protect habitat for sensitive species that have been documented or are likely to exist in the Project area. The study areas used during Tier 3 studies included areas outside the currently proposed Project boundary (Figure 2).

2.2.1 2008 Bitter Root Wildlife Surveys

Wildlife studies were conducted in and near the Project area between March 25 and October 8, 2008. The 2008 study area encompassed a large portion of the current Project area as well as adjacent land in Lincoln County, MN (Figure 5). Studies included fixed-point bird use surveys, breeding bird transect surveys, raptor nest surveys, acoustic bat surveys, and prairie grouse lek surveys.

As part of this study, 149 fixed-point surveys were conducted at ten points (Figure 5). Point count surveys were 20 minutes long. Sixty-eight species were observed throughout the entire study, with slightly higher numbers of species recorded during summer (47 species) than spring (44 species) or fall (33 species). The most common species observed were snow goose, red-winged blackbird, and Canada goose. Of the 14,656 individual birds counted, only 37 were raptors, representing five species. Overall bird use (birds/plot/survey) was considerably higher in the spring (233 birds) than in the summer (10 birds) or fall (21 birds). While passerines were the most abundant bird type in summer and fall, waterfowl was most abundant in spring, due to the large numbers of snow geese that used the area in spring, but not in other seasons. No raptor nests or prairie grouse leks were observed. Two state-protected species (American white pelican and loggerhead shrike) were observed along with 16 species considered in greater conservation need (Table 3).

Bat activity was monitored at three sampling locations from July 15 to September 23, 2008 (Figure 6). Across locations, an average of 37.9 bat passes per night was recorded, ranging from 5.4 to 66.8 pass per night. These activity rates are considerably higher than the rates observed in the 2016 study (see Section 2.2.5). The 2008 study also reported more passes per detector-night at ground stations (66.8) than elevated stations (5.4). Most bats recorded during this study were low-frequency bats (e.g. big brown bats, silver-haired bats, or hoary bats).

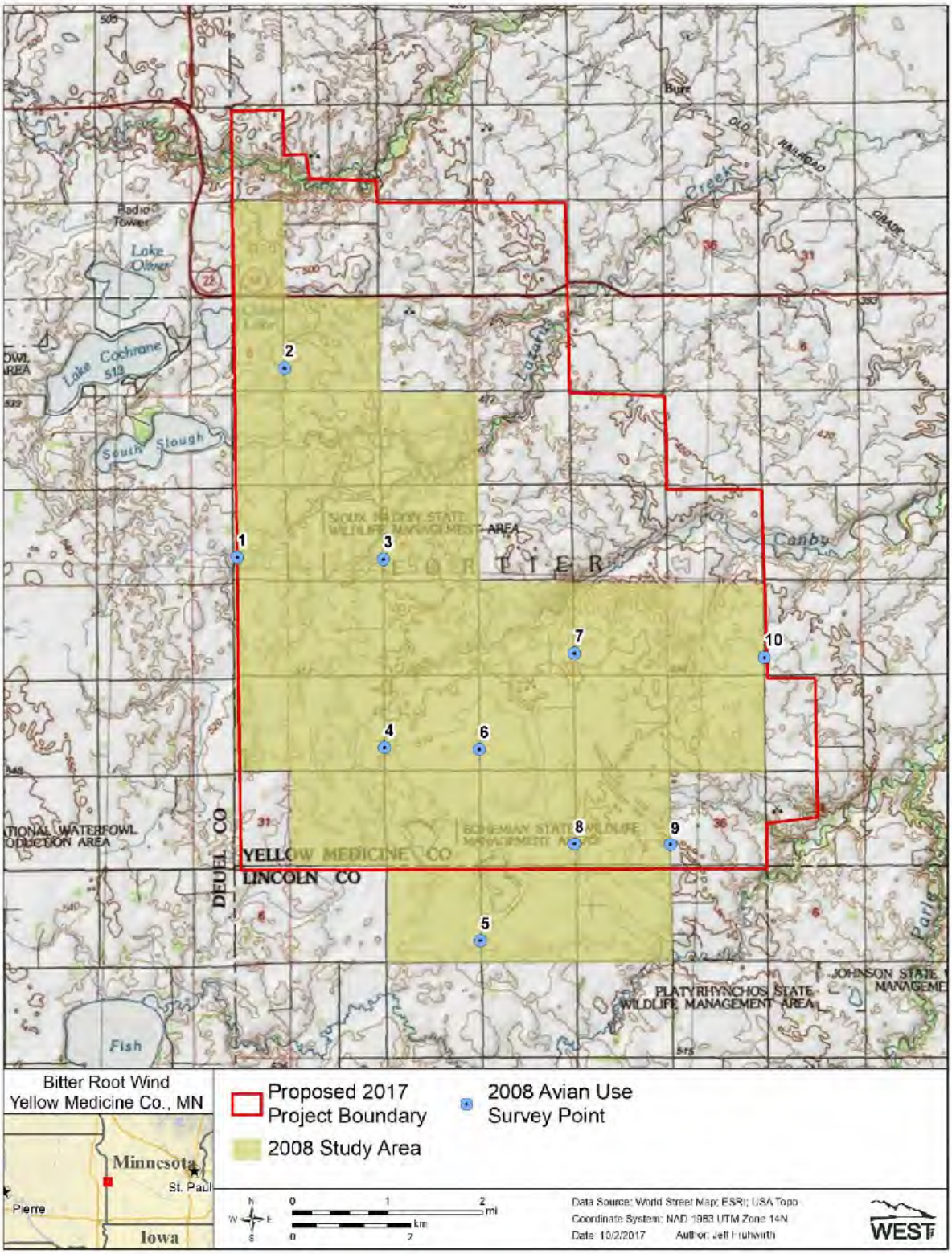

Figure 5. Fixed-point avian use survey locations used during the 2008 wildlife surveys conducted for the Bitter Root Project.

Table 3. Sensitive species observed during studies conducted in the study area from March 25 to October 8, 2008 with protection status as of 2017.

Species	Scientific Name	Observation Type	Status[a]
American white pelican	*Pelecanus erythrorhynchos*	fixed-point, transect, incidental	MN Special Concern
Loggerhead shrike	*Lanius ludovicianus*	fixed-point	MN-Endangered
Sharp-tailed grouse	*Tympanuchus phasianellus*	fixed-point	SGCN
Northern harrier	*Circus cyaneus*	fixed-point, transect, incidental	SGCN
Swainson's hawk	*Buteo swainsoni*	fixed-point, incidental	SGCN
Upland sandpiper	*Bartramia longicauda*	fixed-point	SGCN
Franklin's gull	*Leucophaeus pipixcan*	fixed-point	MN Special Concern
Common nighthawk	*Chordeiles minor*	fixed-point	SGCN
Northern rough-winged swallow	*Stelgidopteryx serripennis*	fixed-point, incidental	SGCN
Field sparrow	*Spizella pusilla*	fixed-point	SGCN
Grasshopper sparrow	*Ammodramus savannarum*	fixed-point, transect, incidental	SGCN
Dickcissel	*Spiza americana*	fixed-point, transect, incidental	SGCN
Bobolink	*Dolichonyx oryzivorus*	fixed-point, transect, incidental	SGCN
Northern pintail	*Anas acuta*	transect	SGCN
American bittern	*Botaurus lentiginosus*	transect, incidental	SGCN
Sedge wren	*Cistothorus platensis*	transect	SGCN
Lesser scaup	*Aythya affinis*	incidental	SGCN
Black-crowned night heron	*Nycticorax nycticorax*	incidental	SGCN

[a] MN DNR Special Concern, Species in Greatest Conservation Need (SGCN)

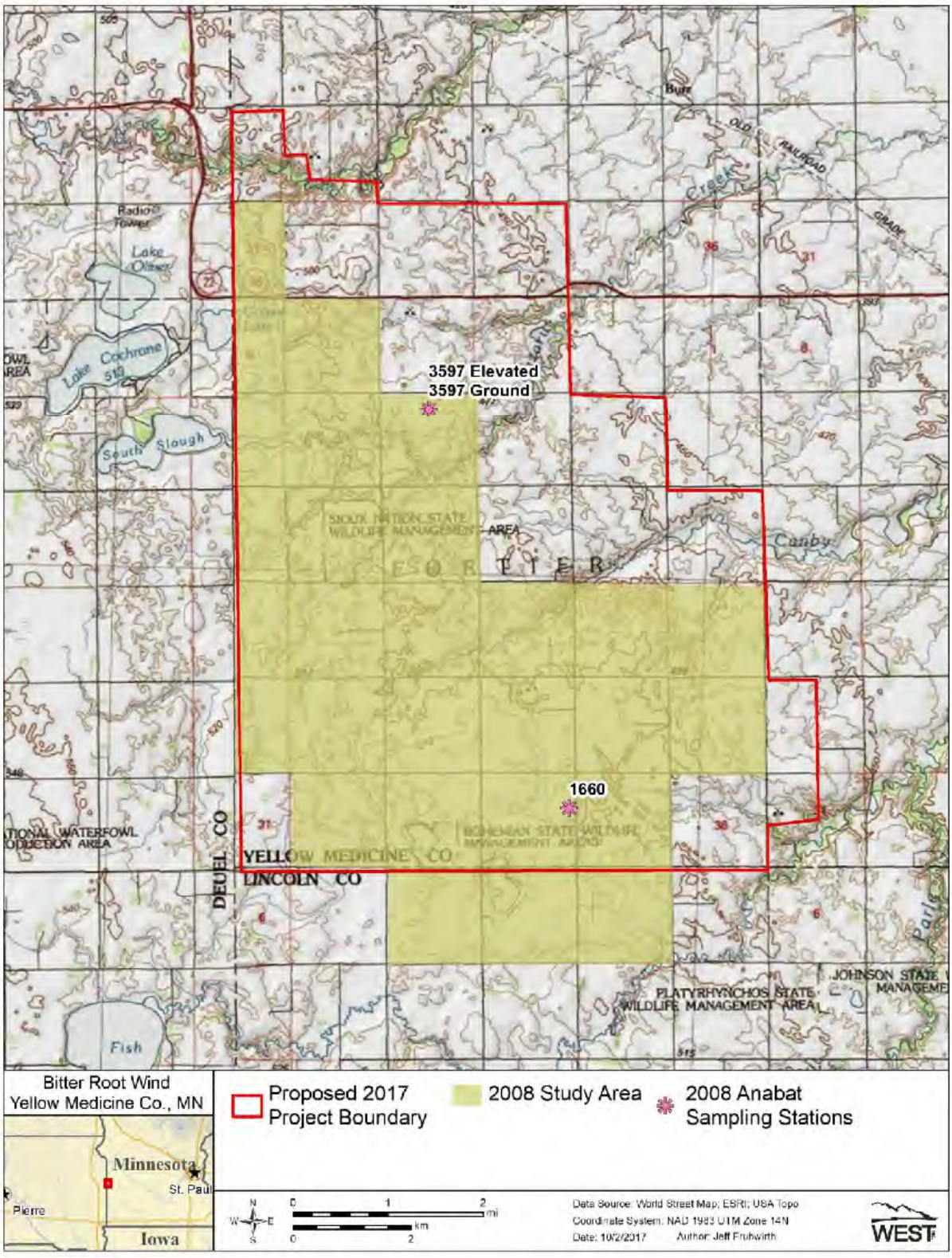

Figure 6. AnaBat sampling stations used in the 2008 wildlife study conducted for the Bitter Root Project.

2.2.2 2016-2017 Avian Use Study

Fixed-point avian use surveys were conducted once per month at 23 point count locations in and near the proposed Project area from March 3, 2016, to January 23, 2017 (Figure 7). These surveys, for small and large birds, followed previously described methods (Reynolds et al. 1980) and adhered to the ECPG (USFWS 2013). Additionally, a wetland bird use survey was also included near open water habitats within the Project area following protocols described in *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (MNDNR 2014, MNDOC 2014).

Large bird diversity was highest in spring, followed by fall, summer, and winter. Small bird diversity was highest in summer, followed by spring, fall, and then winter. Large bird use in spring was mostly waterfowl (86.1%). In summer, large bird use was made of both waterfowl (35.4%) and waterbirds (32.6%). In fall, gulls/terns made up the majority of large bird use (78.4%). In winter, large bird use was predominately waterfowl (66.8%), followed by doves/pigeons (18.9%) and upland game birds (6.8%). Small bird use was dominated by passerines in all seasons. Overall, 319 diurnal raptors were observed, with most observations in fall (133), followed by spring (88), summer (68), and winter (30). Red-tailed hawks were the most common diurnal raptor species observed during the study (115 observations), followed by northern harriers (27 observations) and bald eagles (26 observations).

Wetland bird use surveys included nine 60-minute surveys conducted during three visits between March 16 and May 15, 2016. Waterfowl were the most common bird type recorded during the surveys, representing 97.1% of all observations. The majority of waterfowl observations were of snow geese (3,585 observations) or unidentified ducks (4,654 observations). Only seven diurnal raptors were observed during the wetland bird use surveys, including five red-tailed hawks, one Swainson's hawk, and one bald eagle.

An additional avian point count study focused on large birds only was initiated in June 2017, adding points in the east (24-25) during a project expansion, and then infilling additional points (26-28) within the central portion of the survey area in August 2017 (Figure 5). While results are not yet available from this study, it will include monthly 60-minute surveys at 18 survey points covering the current project boundary through May 2018.

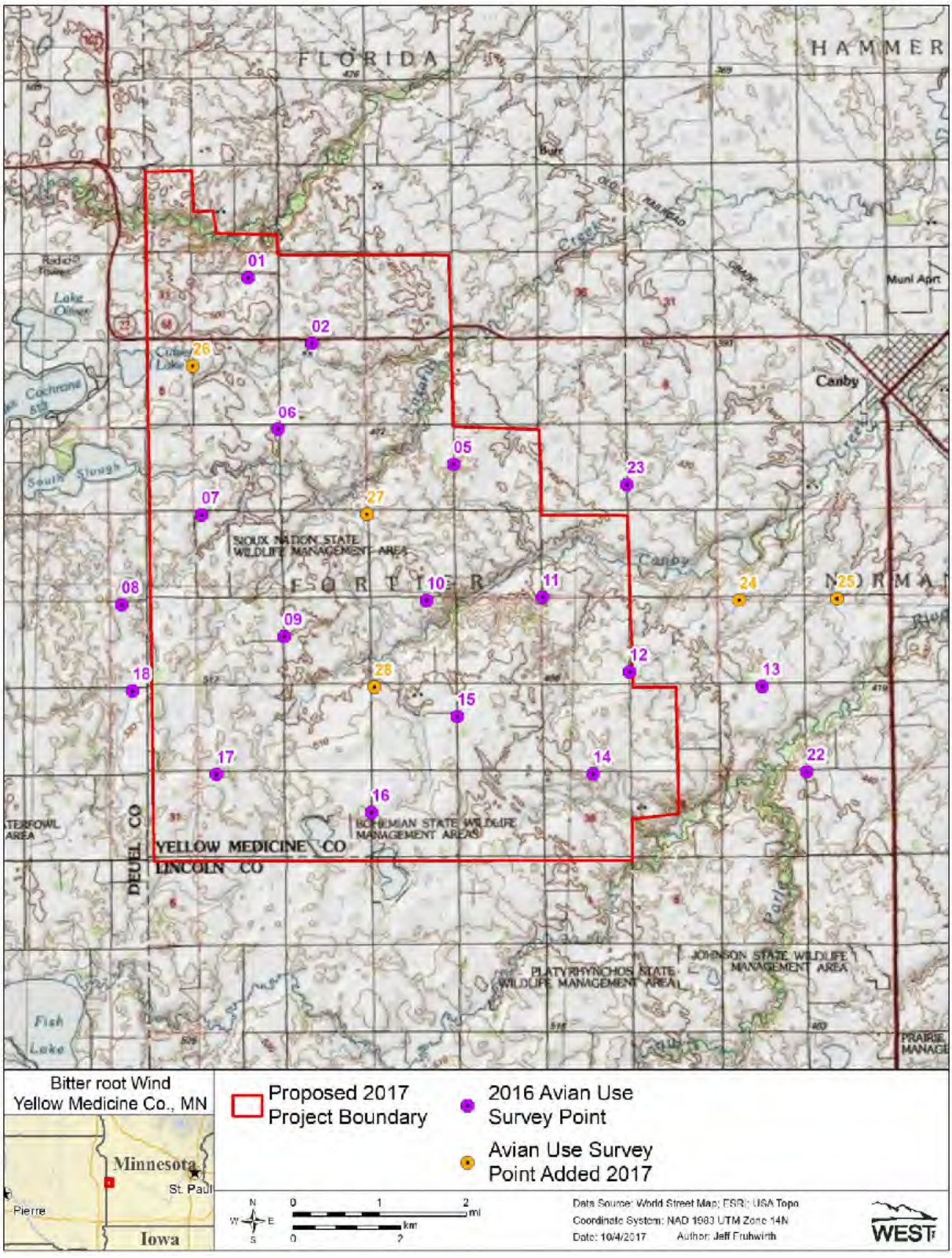

Figure 7. Fixed-point avian use survey points used in the 2016 surveys for the Bitter Root Project.

2.2.3 2016-2017 Raptor Nest Surveys

Raptor nest surveys were conducted from helicopter in spring of 2016 and 2017. Additional follow-up monitoring of eagle activity was completed from the ground after these aerial surveys. The objective was to locate and record raptor nests that may be subject to disturbance or displacement by wind energy facility construction and operation. Surveys were conducted in accordance with the ECPG (USFWS 2013) and the USFWS's *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (Pagel et al. 2010). The survey area included the 2016 study area and a 16-km (10 mi) buffer in 2016 and an 8-km (5 mi) buffer in 2017, including portions of Yellow Medicine and Lincoln counties, Minnesota, and Deuel County, South Dakota.

During 2016, thirty-three raptor nests were observed during the aerial nest surveys, including one active bald eagle nest within the study area boundary (this nest is outside of the currently proposed Project boundary) and six other active bald eagle nests outside the Project boundary (Figure 8). The Project area included five active raptor nests. In addition to the eagle nest, two nests were used by red-tailed hawk, one nest was used by an unidentified owl, and one was used by an unidentified raptor. Other species confirmed breeding within the survey area included red-tailed hawk and great-horned owl.

During 2017, seventeen raptors nests were observed during the aerial nest surveys, including one active bald eagle nest within the 2016 study area (this nest is outside of the currently proposed Project boundary) and four other active bald eagle nests outside the Project boundary (Figure 9). The Project area included three active raptor nests. In addition to the previously mentioned eagle nest, one nest was used by a great horned owl, and another by an unidentified raptor. Other species confirmed breeding within the survey area included red-tailed hawks.

The active bald eagle nest just outside the Project area was initially identified in 2016 (see Nest #16 in Figure 8). Ground monitoring was completed at this site in 2016 that included 24 hours of observations from three locations to determine flight patterns and habitat use. All eagles observed during this monitoring effort were recorded per the ECPG (USFWS 2013). Two adults and one nestling were documented at the nest in May 2016. Adult bald eagles were observed flying to and from the nest, most often flying northeast, northwest, or southeast, in the general direction of Lake Cochrane and the South Slough Complex in Deuel County. Bald eagle activity was lower during the first visit in June 2016, although similar flight patterns were observed and one juvenile was observed at the nest. No eagle activity was observed in the area during visits in July 2016, indicating likely nest failure and abandonment. During 2017, this nest was occupied by a great horned owl. However, a new nest was located and occupied by a bald eagle further to the southwest and may represent the same territorial pair (see Nest #1620 in Figure 9); eagle Nest #1620 is believed to have failed before June 2017.

Additional ground monitoring of the nest to the southeast of the Project boundary was completed in 2017 (see Nest #6 in Figure 8 or Nest #1616 in Figure 9). Based on about 16 hours of observations between May and mid-July 2017, a majority of eagle activity associated with this nest appeared to be concentrated along the Lac qui Parle River corridor.

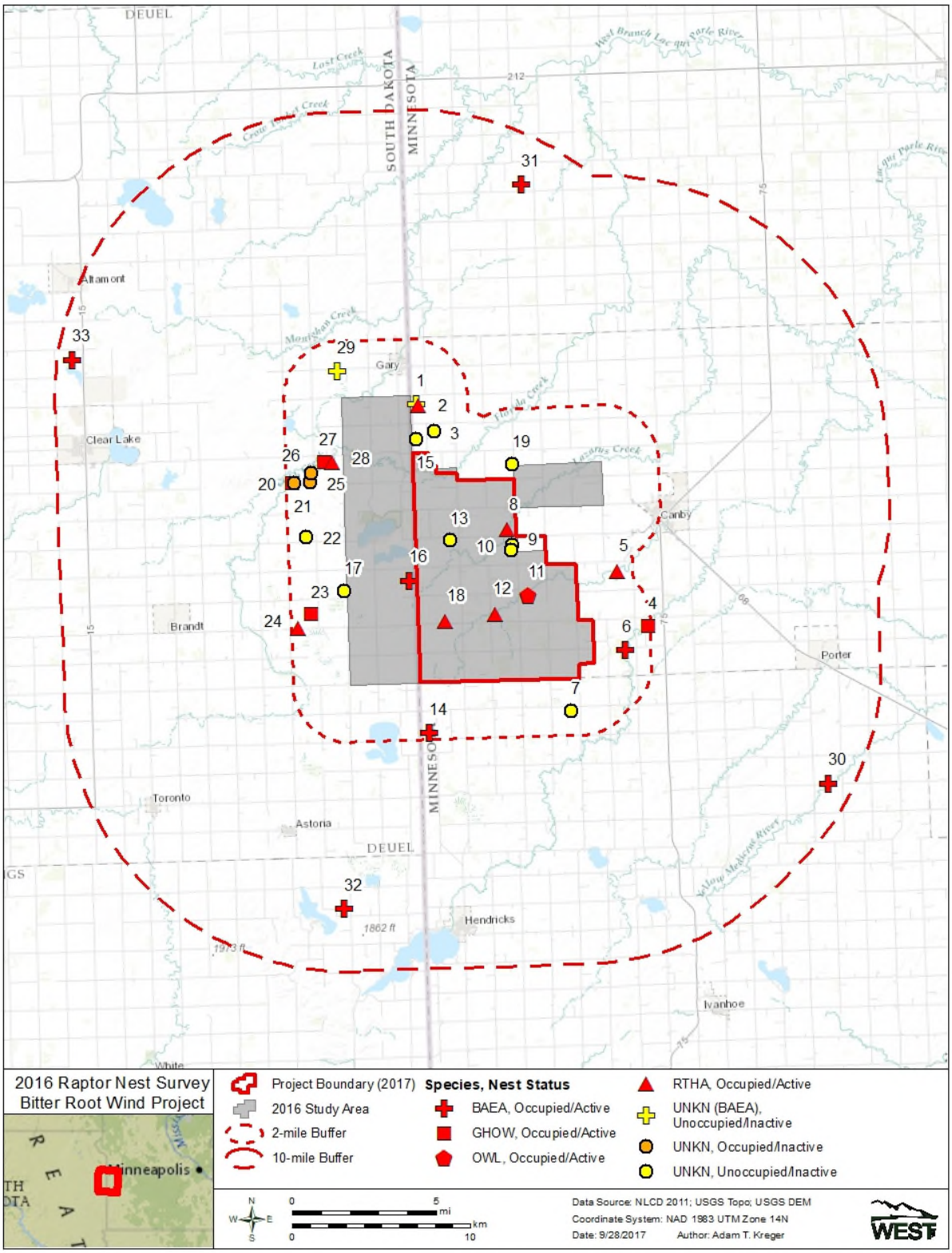

Figure 8. Raptor nests locations within a 10-mile buffer around the 2016 study area identified in 2016.

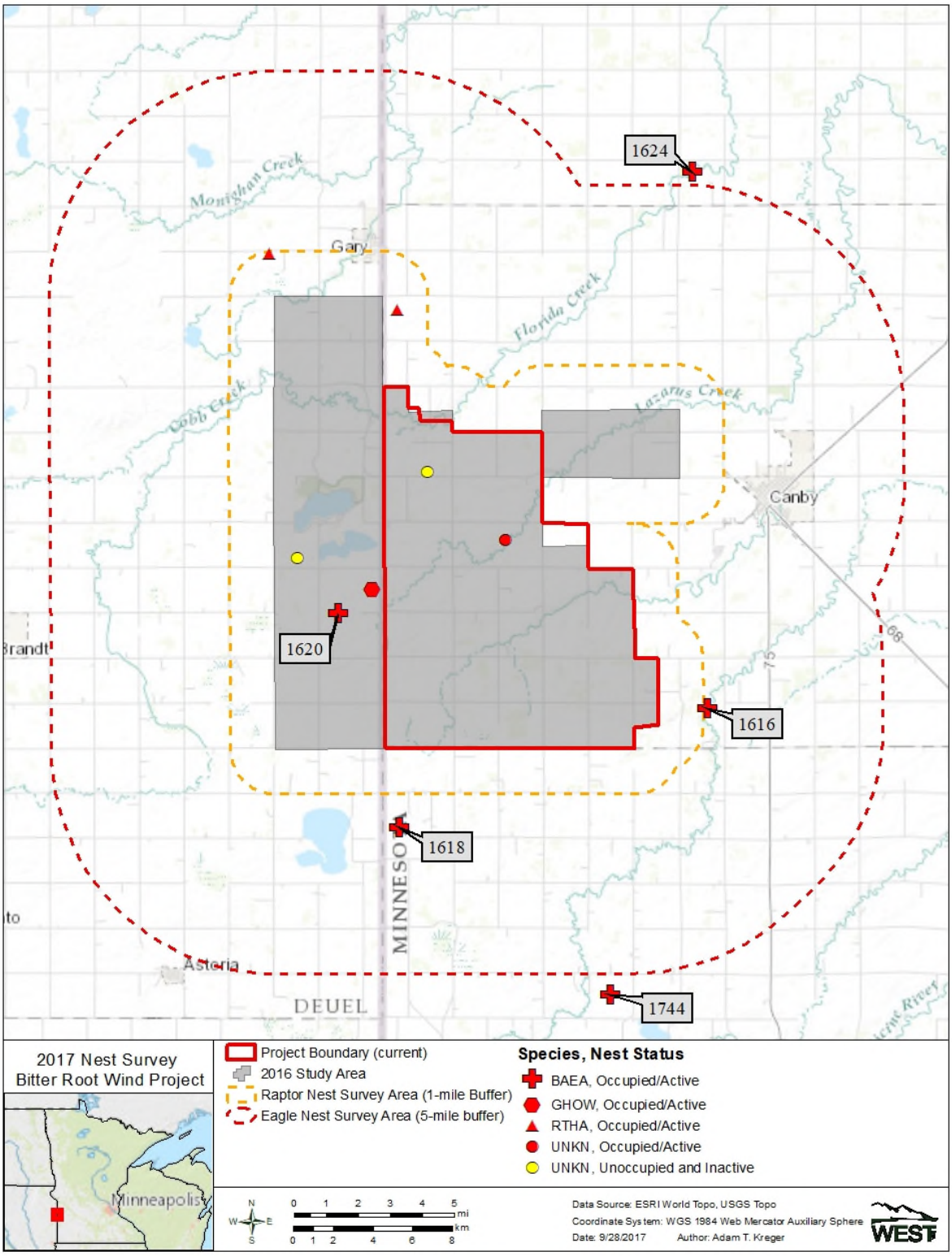

Figure 9. Raptor nests locations within a 5-mile buffer of the 2016 study area identified in 2017.

2.2.4 2016 Avian Grassland Survey

Western Yellow Medicine County includes a considerable amount of grassland habitat, which is important for several species of concern likely to exist in the Project area. As such, a grassland bird assessment was completed in areas within and near the Project area. This assessment was meant to document bird use in grassland habitats, particularly during the breeding season, in order to evaluate potential impacts on grassland bird diversity and breeding grassland bird species in the Project area.

Line-transect surveys were designed based on methods outlined in MNDNR and MNDOC wildlife study protocols (MNDNR and MNDOC 2014). Transects were placed in five grassland areas within the study area (Figure 10). Each grassland area included two 200-m (656-ft) transects, spaced at least 250 m (820 ft) apart and 150 m from the edge of the grassland habitat. Surveys were conducted during three separate morning visits between June 18 and July 6, 2016.

During the grassland bird surveys, 1,290 individual birds representing 52 unique species were recorded. The most common species observed included red-winged blackbird, bobolink, cliff swallow, grasshopper sparrow, and western meadowlark. Passerines accounted for 90% of birds observed during the assessment. Six red-tailed hawks were also recorded, but no eagles or other raptors were observed. No species protected by the ESA were observed, but 11 state-listed species were recorded (Table 4), including four loggerhead shrikes, which was the only state-listed endangered species observed. All other sensitive species observed during this study were state-listed as Species of Special Concern or Species of Greatest Conservation Need (Table 4). In general, the grassland bird study showed that intact grasslands within the study area host large densities of grassland-associated bird species and diverse bird communities.

Table 4. Summary of sensitive species observed near the Bitter Root Wind Energy Project during grassland bird use surveys from June 18 to July 6, 2016.

Species	Scientific Name	Status	# grps	# obs
American white pelican	*Pelecanus erythrorhynchos*	SC	4	20
Brown thrasher	*Toxostoma rufum*	SGCN	1	1
Common nighthawk	*Chordeiles minor*	SGCN	3	5
Dickcissel	*Spiza americana*	SGCN	11	13
Grasshopper sparrow	*Ammodramus savannarum*	SGCN	80	80
Loggerhead shrike	*Lanius ludovicianus*	SE	4	4
Sedge wren	*Cistothorus platensis*	SGCN	25	25
Upland sandpiper	*Bartramia longicauda*	SGCN	20	20
Western kingbird	*Tyrannus verticalis*	SGCN	3	3
Western meadowlark	*Sturnella neglecta*	SGCN	82	83
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SGCN	25	42
Total	**Species**		**258**	**296**

SE = state-listed endangered species; SC = state species of special concern; SGCN = state species of greatest conservation need (MNDNR 2016)

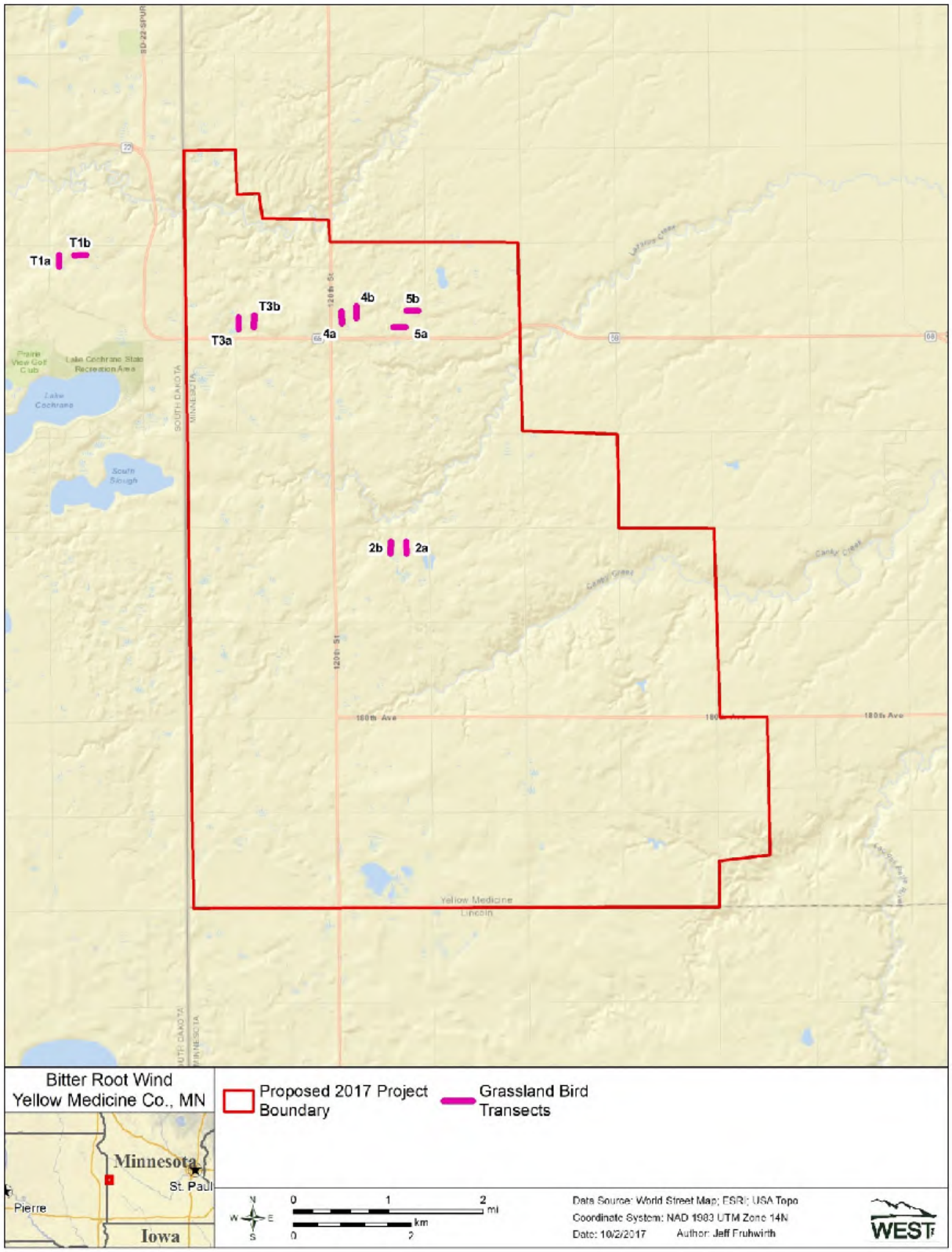

Figure 10. Grassland bird survey transects near the Bitter Root Wind Energy Project area.

2.2.5 2016 Bat Acoustic Study

An acoustic bat study was conducted to further assess bat activity patterns within the 2016 study area between April 2 and November 1, 2016. The specific objectives were to: (1) estimate levels of bat activity at met towers and ground locations within the Project area; (2) estimate activity levels for bats with high-frequency (HF) and low-frequency (LF) calls; and (3) analyze potential correlations between bat activity and weather variables (i.e., wind speed, temperature, and relative humidity).

Acoustic detectors at seven locations throughout the study area (Figure 11) recorded 9,744 bat passes over 1,077 detector-nights. The number of bat passes per detector-night appeared consistent between detectors, ranging from 6.05 to 9.21 passes per night, except for one detector (BR5g) that recorded notably higher activity (21.14 passes per night). While it is unknown why activity has higher at detector BR5g, a small wooded lot near the station may have provided attractive maternity habitat. The average rate of passes per detector-night (± SE) was highest in summer (14.53 ± 0.86), followed by fall (5.95 ± 0.85) and then spring (3.30 ± 0.61). While bat activity correlated with weather variables, no causal association was determined. Bat passes per detector-night and wind speed were negatively correlated (Pearson product-moment correlation coefficient = -0.18, $p = 0.010$). Peak bat activity occurred in summer, corresponding with higher average temperatures (Pearson product-moment correlation coefficient = 0.58, $p < 0.001$). Relative humidity and bat activity were also significantly correlated (Pearson's correlation coefficient = 0.29, $p < 0.001$). Approximately 91% of bats recorded were in the low-frequency category, representing either big brown bats, hoary bats, or silver-haired bats.

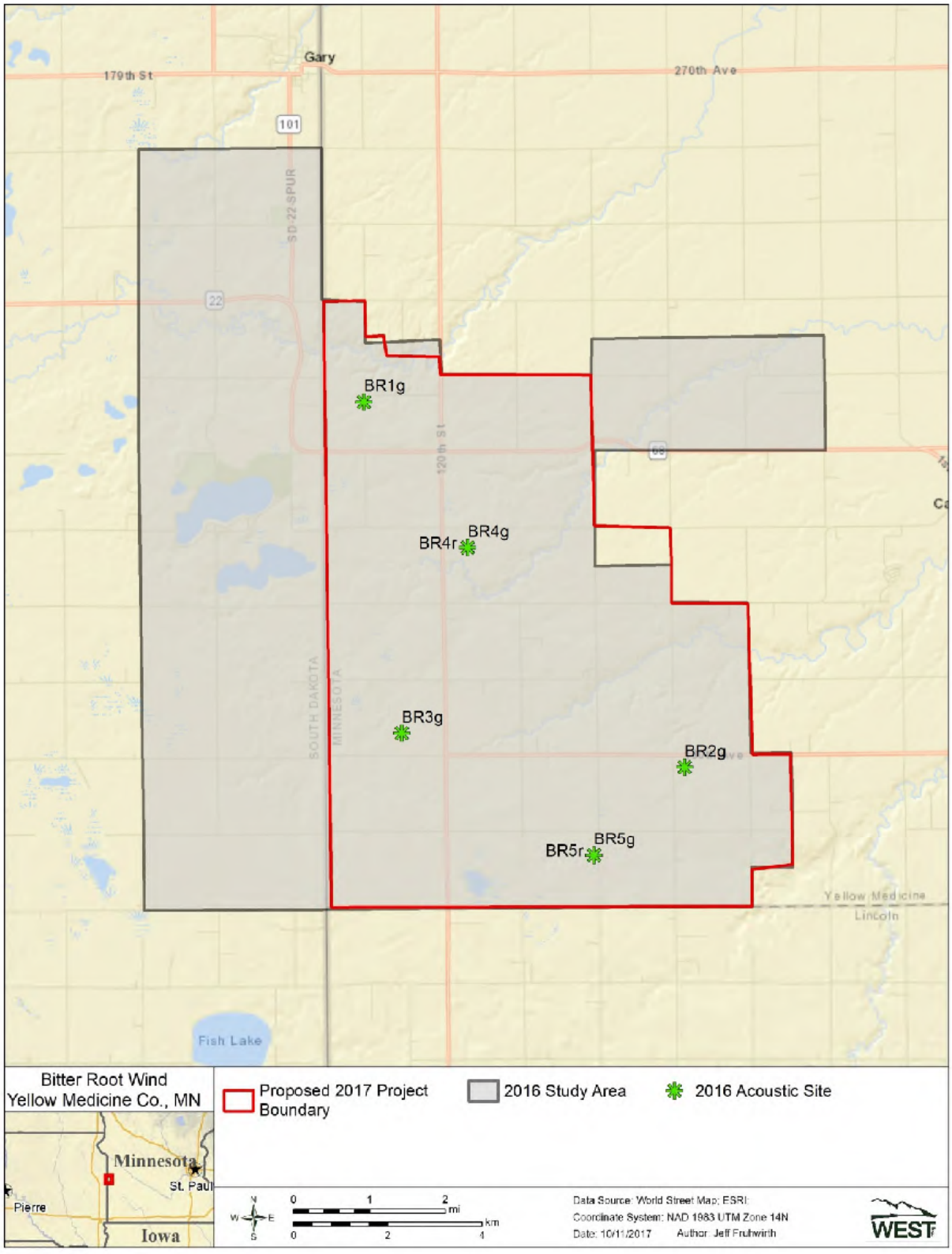

Figure 11. Locations of 2016 bat acoustic survey stations within the proposed Bitter Root Wind Energy Project area.

2.2.6 2016 Northern Long-eared Bat Presence/Absence Acoustic Surveys

In order to evaluate the potential presence of northern long-eared bats (NLEB) within the Project area, WEST conducted acoustic presence/absence surveys in the 2016 study area. These bat acoustic surveys followed the U.S. Fish and Wildlife Service's *2016 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2016), which are also applicable to NLEB, per the *Northern Long-Eared Bat Interim Conference and Planning Guidance* (USFWS 2014).

Acoustic surveys were conducted from July 26 to July 28, 2016 at two sites of suitable NLEB habitat, using two detector stations at each site (Figure 12). These sites were selected because they appeared to provide some of the best habitat in and near the Project area. Each station was surveyed for two nights for eight complete detector nights. Detectors were programmed to record from before sunset to sunrise each survey night. For each acoustic survey location, the date, start and end times, site description, site coordinates, and weather data were recorded. Representative photographs of each acoustic survey station were also taken. Bats were surveyed using full spectrum Song Meter SM3 acoustic recorders (Wildlife Acoustics, Inc.). Bat calls were quantitatively identified using an automated acoustic bat identification software program approved by the USFWS (Kaleidoscope Pro, version 3.1.7, Wildlife Acoustics, Inc.).

Kaleidoscope software recognized 1,972 bat call files and identified 1,926 (97.7%) of them to species. The average number of bat calls per detector night was 240.75. No potential NLEB calls were identified. This report concluded that NLEB were unlikely to occur within the habitat sampled. Additionally, maternity roost trees or hibernacula sites for NLEB have not historically been recorded in the area (MNDNR and USFWS 2016).

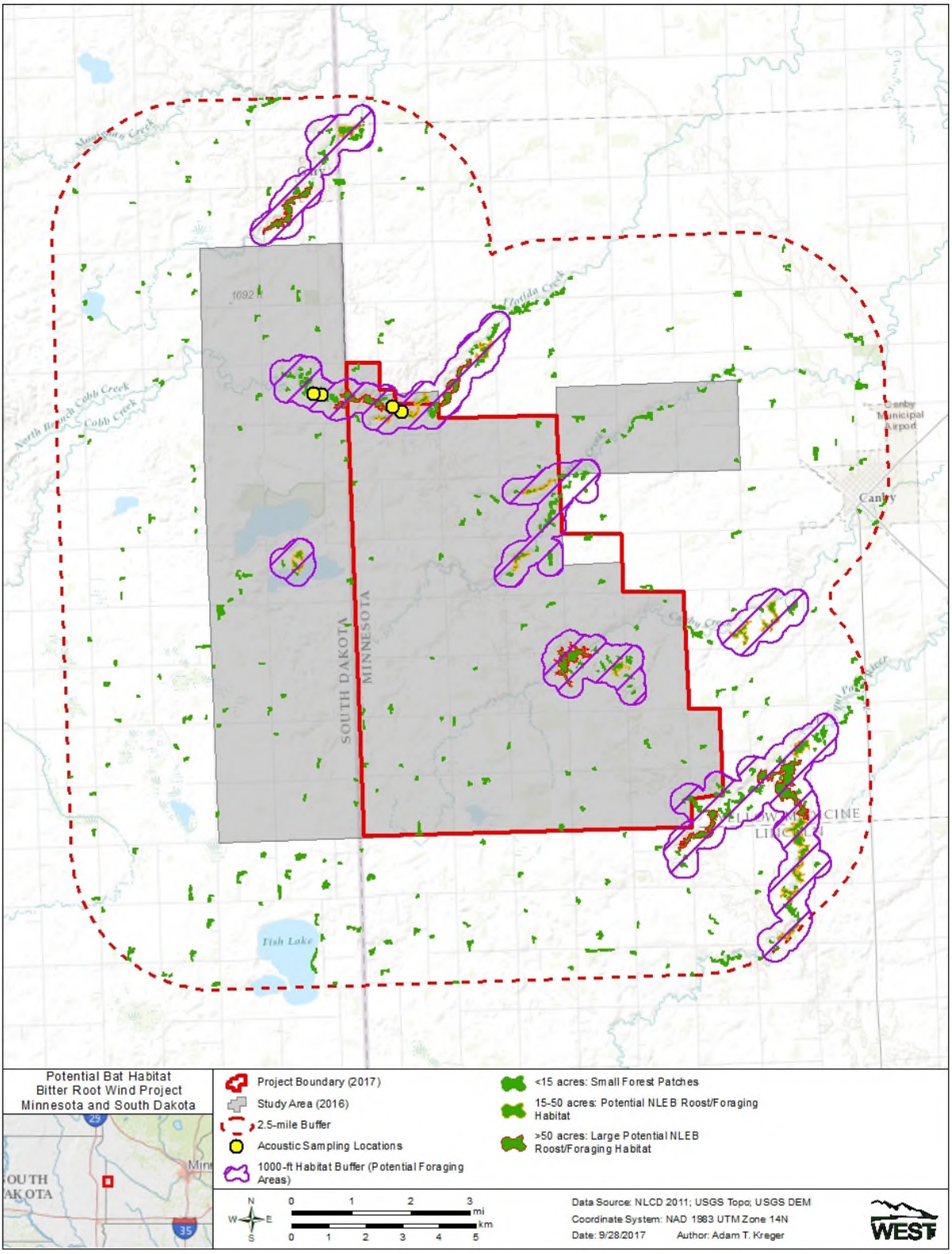

Figure 12. Acoustic sampling sites of potential northern long-eared bat habitat near the proposed Project boundary.

2.2.7 2016 Grassland Condition and Dakota Skipper/Poweshiek Skipperling Habitat Assessment

A field habitat assessment was conducted from August 15–17, 2016, to determine whether the area was suitable for the federally threatened Dakota skipper or the federally endangered Poweshiek skipperling. This habitat assessment included a GIS-based desktop analysis to identify areas of grassland that might be native prairie. The GIS-based desktop analysis considered NLCD cover types, public lands and conservation easements, MNDNR's Sites of Biodiversity Significance (Figure 13), MNDNR Native Prairies (Figure 14), potentially undisturbed land, and National Wetlands Inventory information.

To assess grassland condition, 25 grassland transects were established within the 2016 study area (Figure 15); survey areas were chosen specifically to assess areas expected to be developed at the time. Based on the field assessment, many of the grasslands assessed were native prairie with some invasive species. Most of the sampled transects included a large proportion of invasive species and only three survey transects (and the reference transects) included quadrats with less than 75% invasive species coverage. All transects on private lands appeared to have been used for grazing and haying. From the desktop analysis and observations in the field, the majority of the grassland transects appeared unbroken (i.e., have never been tilled), although cattle grazing was often extensive. None of the evaluated private land sites were of adequate quality to support the presence of Dakota skipper or Poweshiek skipperling.

Surveys following similar protocols were conducted again in 2017 at grassland sites not previously evaluated. The results of this survey will be presented in a subsequent study report, and this document will be updated accordingly.

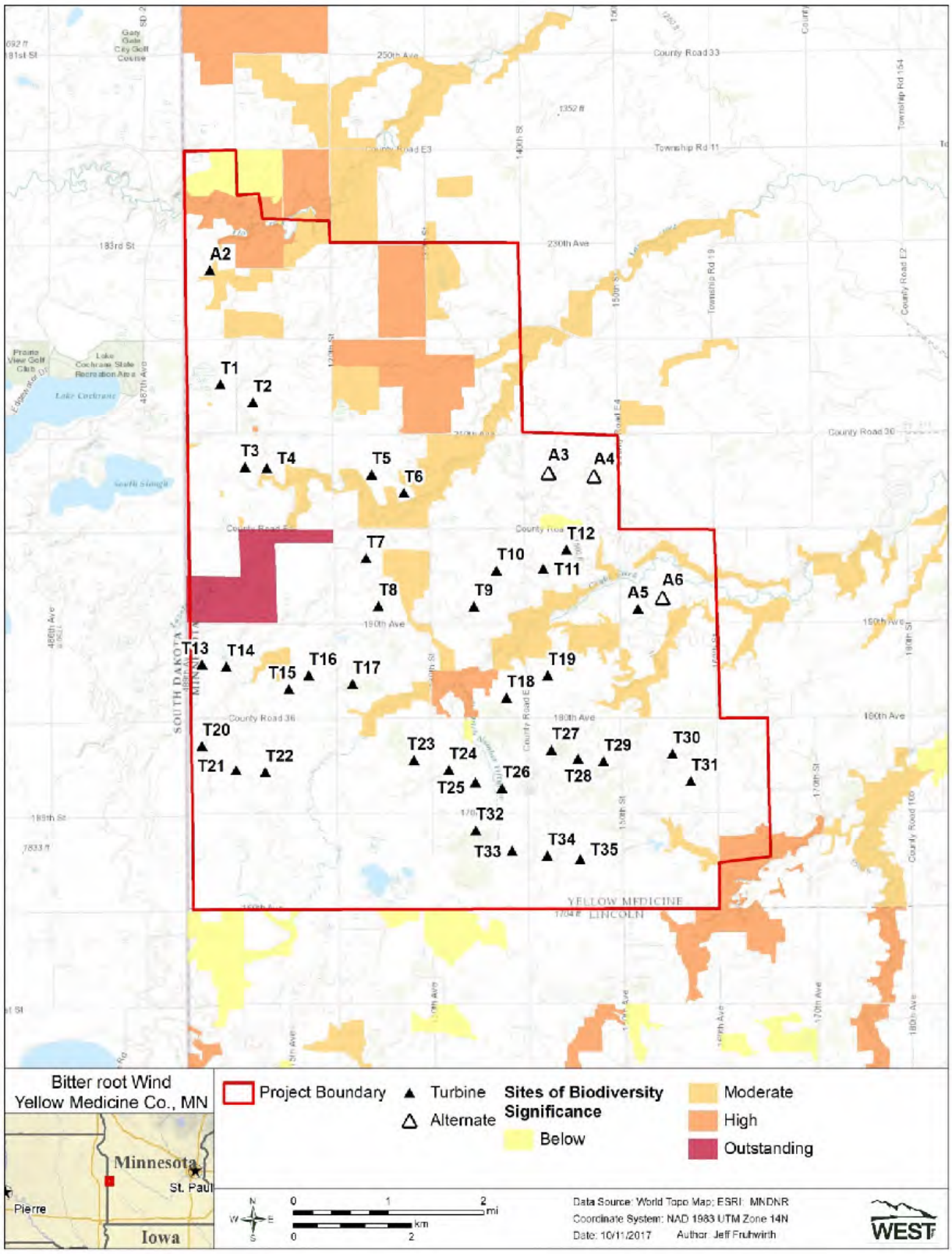

Figure 13. Sites of Biodiversity Significance, by significance level, within and near the Bitter Root Wind Energy Project area.

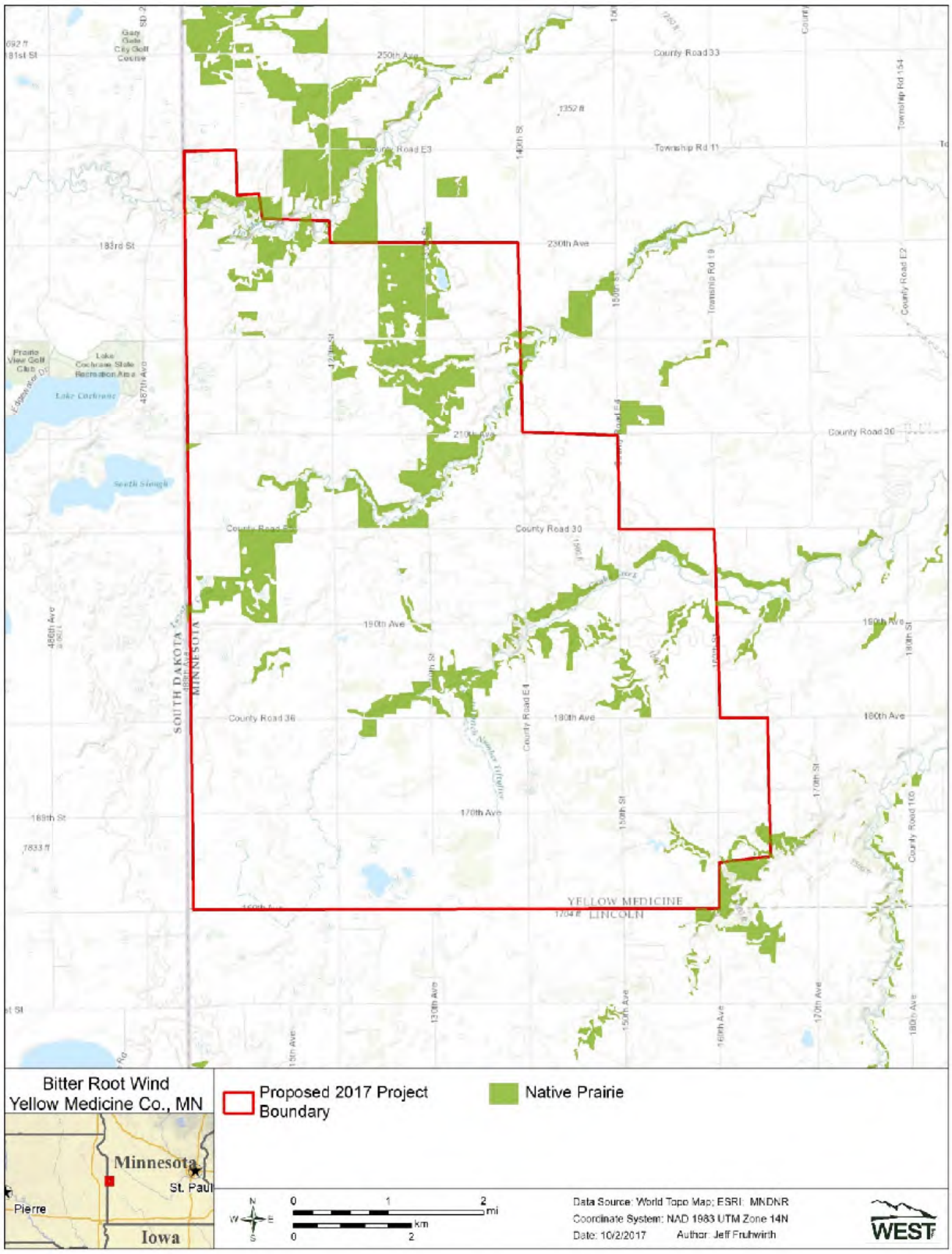

Figure 14. State delineated prairie lands within and near Bitter Root Wind Energy Project area.

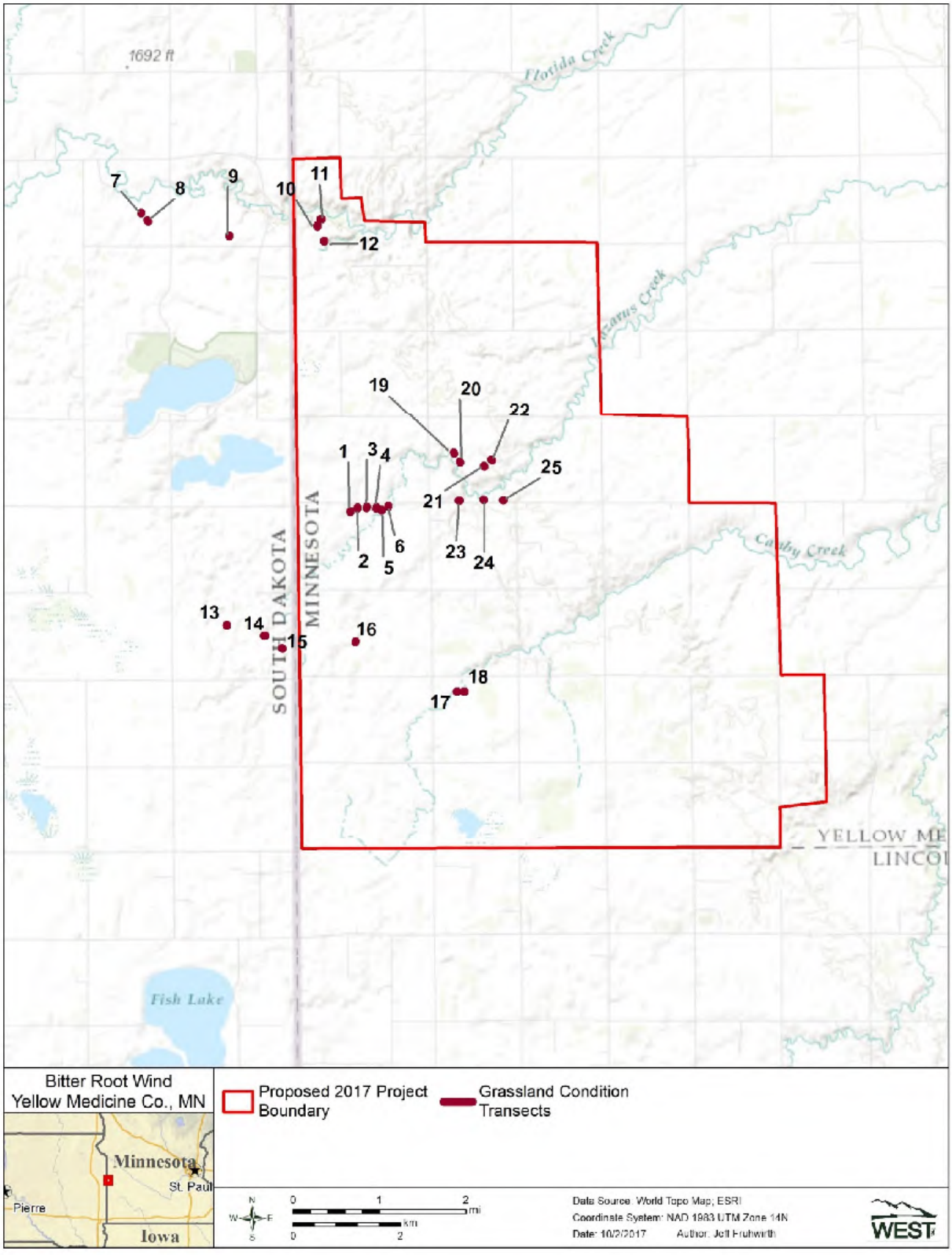

Figure 15. Locations of grassland transects evaluated within the Bitter Root Wind Energy Project area, August 2016.

2.2.8 Summary of Tier 3 Questions

Do field studies indicate that species of concern are present on or likely to use the proposed site?

Yes – field studies found that multiple state-listed species of concern occur within the Project area (Tables 3 and 4). Sensitive species observed included one state-listed endangered species (loggerhead shrike), one state-listed species of special concern (American white pelican), and fifteen species considered in Greatest Conservation Need (MNDNR 2016). No federally listed endangered or threatened species were found within the Project area. Bald eagles were observed and found to nest in the general vicinity of the Project.

Do field studies indicate potential for significant adverse impacts on the affected populations of species of habitat fragmentation concern?

Based on the bird and bat studies described above, potential for significant adverse impacts to species of habitat fragmentation concern is generally low. However, grassland studies indicated that the Project area contains intact grasslands that support healthy grassland bird communities. Fragmentation of grassland habitats would be a concern for these bird communities.

What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed project?

Sensitive species recorded during the grassland bird surveys and those listed in the 2008 wildlife studies are mainly found in grassland or wetland habitats. Of the species of concern observed during the 2016 grassland bird surveys, grasshopper sparrows and western meadowlarks were most abundant (Table 4). Other species of concern, including the northern NLEB and the bald eagle, prefer wooded areas near water. Preferred NLEB habitat is limited within the proposed Project boundary, but notable areas do occur along parts of Canby Creek, which runs through the southern portion of the Project area, and Florida Creek in the northern portion of the Project area (Figure 12). These areas may also provide suitable habitat for nesting bald eagles, whereas treeless areas of open water (see Figure 3) are more suitable for foraging eagles.

Many of the sensitive species recorded in the Project area are migratory and are likely to occur within or near the Project area only during certain times of the year. Species that occur within the Project area during a particular season (e.g. migration or summer breeding) are exposed to relatively higher risk during this time, but lower risk in other seasons.

What are the potential risks of adverse impacts of the proposed project to individuals and local populations of species of concern and their habitats?

Species of concern within or near the Project area are listed in Tables 3 and 4. The Project area includes a considerable amount of habitat important to local populations of species of concern, including native prairie and wetland habitats, although the majority of the Project area is used for cultivated crops (Table 1) which are of low habitat value for most wildlife species. Potential risks to individuals and local populations of species of concern and their habitats include collision with wind turbines and associated facilities situated within or near important wildlife habitats.

How can developers mitigate identified significant adverse impacts?

The USFWS and other wildlife agencies generally recommend that the siting of wind projects and placement of turbines is one of the best methods to minimize potential impacts to wildlife. While no significant adverse impacts to species of concern are expected, development of the site could avoid and minimize potential adverse impacts to wildlife by minimizing development in or near important wildlife habitats, such as native prairie, wetland, and forested areas. For example, although NLEB were not found to be present in the Project area during acoustic surveys during the summer months, turbines have been generally sited over 1,000 feet from potential NLEB summer habitat (only turbine T19 falls within 1,000 feet of potential NLEB habitat, located just over 800 feet from the nearest wooded area).

Are there studies that should be initiated at this stage that would be continued in either Tier 4 or Tier 5?

The Company plans to conduct Tier 4, post-construction monitoring studies for the Project as detailed in Section 4 of this BBCS.

2.2.9 Potential Impacts to Birds and Bats

Tier 3 of the WEG recommends that wind facility operators evaluate the potential direct and indirect impacts from a project on birds and bats. The analysis presented below addresses the impacts associated with project siting and turbine placement, construction, operations and maintenance, and decommission of wind energy facilities.

The Project is dominated by agriculture and the majority of turbines will be placed in cultivated fields, avoiding sites of biodiversity significance or prairie habitats.

Bird species diversity is typical of an intensive agricultural landscape with patches of grassland, woodlands, and wetlands. Impacts to migratory birds are anticipated to be similar to other projects in southern Minnesota and elsewhere in the Midwest. Displacement to nesting migratory birds is expected to be minimal.

Although waterfowl were one of the more common birds observed during avian use surveys, waterfowl are not particularly susceptible to turbine collisions. Although waterfowl fly at heights similar to the rotor swept height of proposed turbines, studies at wind projects in relatively high waterfowl-use areas show that waterfowl are not especially vulnerable to turbine collisions (Jain 2005, Grodsky and Drake 2011).

Bald eagles were observed in relatively low numbers within the Project area. Furthermore, the nest located to the west of the proposed Project site (see Nest #1620 in Figure 9) is about 1.25 miles from the nearest turbine. As a majority of eagle movements around this nest are expected to be towards Lake Cochrane and South Slough to the north, the Project turbines are not expected to pose significant risk to this nesting pair. Additionally, the nest located to the east of the proposed Project (see Nest #1616 in Figure 9) is nearly 2 miles from the nearest turbine. As a majority of eagle movements around this nest are expected to be concentrated along the La qui Parle River, the Project turbines are likewise not expected to pose a risk to this nesting pair. As such, the Project is not anticipated to adversely affect bald eagles.

Based on the Project's location in an agricultural area, the Company anticipates that any impact to bats will fall within the range of other wind energy projects in southern Minnesota and the Midwest region. However, it is unclear from the mixed survey data across the years what the actual level of bat mortality may be, as pre-construction bat use levels do not appear to be correlated to post-construction fatality levels. Overall, based on the location of the Project, general lack of habitat within the Project area, fatality data from facilities close to the Project and the moderate bat activity levels (when compared to facilities throughout the US) observed during Tier 3 surveys, moderate levels of bat mortality could occur from the Project but significant adverse impacts are not anticipated. The post-construction fatality monitoring surveys planned for the Project (see Section 4) are designed to provide empirical data on actual bat fatalities that can be compared to the pre-construction survey data from the Project area. The Company has also developed adaptive management measures that may be used if bat mortality is higher than expected, as detailed in Section 6.

2.3 Summary of Agency Consultations

The WEG states that consultation with state and federal wildlife agencies is paramount early in the development process as the developer gathers the information necessary for the tiered review process. The Company obtained input on the Project siting and development and received early comments during meetings with members of the MNDNR, MNDOC, USFWS, and WEST, as well as written reviews provided by the state. These communications highlighted the need to avoid sensitive habitats in the Project vicinity, including native grassland and calcareous fens. These meetings and communications covered earlier wildlife studies that had been completed and planned for the Project area. Correspondence with the MNDNR discussed sites of biodiversity significance and state-listed sensitive species near the Project area (Table 2). The MNDNR requested that the Company consult further with them as the Project moved forward into the LWECS Site Permit process. The Company has complied with this request throughout development of the Project, including correspondence with MNDNR before and after three rounds of fen surveys and a meeting with MNDNR and MNDOC to provide an update on

the Project layout and survey results in July 2017. The agency consultation letters are attached in Appendix A.

3 SITING AND CONSTRUCTION PHASE WILDLIFE MEASURES

3.1 Project Siting, Construction, and Best Management Practices

Information gathered during Tier 1, 2, and 3 studies will be used during the final turbine and infrastructure siting process to minimize potential impacts to birds, bats, and their habitats. Prior to designing the facility layout, the Company incorporated setback and constraint information from expert sources, literature reviews, environmental assessments, and siting feedback provided from the agencies during the LWECS site permit pre-application process.

3.1.1 Project Siting Measures Used to Reduce Impacts

- The Project will be sited in a heavily cultivated landscape to avoid impacts to wildlife and critical habitats, to the extent practicable, considering Minnesota state setbacks and landowner participation.
- Project turbines and other permanent aboveground facilities have been sited away from conservation and managed lands, as well as sensitive lands provided by the Minnesota Department of Natural Resources (MNDNR)[1].
- Project turbines have been sited at least 1.25 miles from eagle nests.
- Project turbines and associated facilities have been sited away from calcareous fens to avoid all impacts to these sensitive features.
- The Project will reduce the overall footprint, moving away from larger portions of potential habitat (such as that found along the Cobb Creek and Lac qui Parle River corridors; Figure 12), and minimize the number of turbines near wetlands, thereby lowering the potential impact to birds and bats.
- The Project layout will comply with Minnesota state and Yellow Medicine County setbacks for non-participating landowners, residences, sensitive environmental areas, noise, airports, etc[2].
- Existing roads and field accesses will be used or improved for access roads when practicable.

[1] Including USFWS Waterfowl Production Areas, USFWS easements, MN DNR Wildlife Management Areas, MN DNR Native Prairies, MN DNR Native Plan Communities, MN DNR Calcareous Fens, MN DNR Scientific and Natural Areas, and Minnesota County Biological Survey "Sites of Biodiversity Significance."

[2] The Company will comply with applicable Deuel County and South Dakota setbacks for the Project substation and overhead transmission line.

- The currently proposed Project boundary was greatly reduced from the initial Bitter Root Wind Resource Area and original Project boundary in order to avoid sensitive habitats and key features or lands that could attract and/or concentrate wildlife use. Lake Cochrane, South Slough, Bohemian State Wildlife Management Area, and the riparian zone of Florida/Cobb Creek were all avoided by reducing the overall size of the Project boundary (Figure 3, Figure 12).
- The Company consulted with the MNDNR and surveyed for calcareous fens within the Project boundary to avoid impacts to these habitats.

3.1.2 Project Design Used to Reduce Impacts

- Wind turbines were designed with tubular towers and no external ladders or platforms on the towers or nacelles will be used so bird perching and nesting platforms are minimized.
- Turbines and associated infrastructure were sited to minimize environmental impacts. The turbines have been sited primarily in cultivated fields to avoid impacts on the natural resource areas in the Project site.
- The Company has selected higher capacity turbines, reducing the number of turbines and associated infrastructure needed for the Project and thus reducing the overall environmental impact.
- Turbines and infrastructure have also been sited to avoid impacts on native prairies, calcareous fens, and sites of biodiversity significance designated as “high” or “moderate”. Impacts to wetlands will be minimized and avoided to the extent feasible, and any impacts will be permitted in accordance with Section 404 and Minnesota Clean Water Act requirements.
- The Project has been designed to avoid any new overhead transmission lines within the Project area[3], further reducing the potential impacts to avian species.
- Turbines will include Aircraft Detection Lighting Systems designed to activate obstruction lights only when needed by aircraft and reduce the impact of nighttime lighting on migratory birds, according to Federal Aviation Administration (FAA) requirements.
- FAA-approved lighting uses the shortest allowable flash duration and the minimum allowed flashes per minute. All lights will flash at the same time so that nocturnal migrating birds are not disoriented by lights.
- Lighting at the operations and maintenance (O&M) facility, Project substation, and other installations will be minimized and designed so that light is directed downward (toward the access or work area) and will be hooded to prevent light from shining into the sky and attracting or disorienting nocturnal migrants. Motion or heat-activated lighting will be used where practicable.
- The minimum number of permanent meteorological (met) towers required by grid operators will be installed and constructed without guy-wires to minimize collision risk for birds. Temporary guyed met towers will be removed within one year of operation.
- Electrical collection systems within the Project will be buried underground.

[3] Overhead transmission lines will run from the substation to the point of interconnection in South Dakota.

- Above-ground electrical transmission lines, transformers, and conductors will follow guidance from the Avian Power Line Interaction Committee (APLIC 1994, 2006, 2012) to avoid and minimize risk of potential avian collisions or electrocutions.

3.2 Construction Measures

Construction activities are planned to start in 2018. Measures that will be taken to minimize wildlife impacts during construction are described below.

3.2.1 Construction and Operational Procedures to Minimize Impacts

- Impacts to wetlands and water resources will be avoided or mitigated with input from the MN DNR and by following provisions of the Clean Water Act (CWA 1972) and the Wetland Conservation Act.
- Impacts to loggerhead shrikes will be avoided by either: 1) timing construction so that any clearing of isolated trees and shrubs or trees and shrubs within shelterbelts or field/road edges will be done outside of the shrike nesting season (mid-April to mid-July); or 2) contracting a qualified biologist to conduct a survey to confirm shrike nests are not active in trees or shrubs to be removed prior to clearing conducted during the nesting season.
- A Site Environmental Plan specific to construction activities will be developed and implemented by the Site Environmental Manager, including, but not limited to:
  - exhibits identifying sensitive resources and associated setbacks;
  - an employee orientation program to raise awareness of any wildlife issues on the site, as well as how to treat sensitive resource areas;
  - instructions for employees and contractors to drive at an appropriate speed on all public and private roads in the Project area, in consideration of potential wildlife that may be present and to promote general site safety;
  - federal and state measures for handling toxic substances to minimize contamination of water and wildlife resources; and
  - local policies for noxious weed control (e.g., cleaning vehicles and equipment arriving from areas with known invasive species, using locally-sourced topsoil, identification and annual removal of noxious weeds, etc.)[4];
- The Site Environmental Plan will be updated for the operational phase, and will also include:
  - instructions for employees to avoid harassing or disturbing wildlife, especially during the breeding seasons;
  - instructions to store parts and equipment that may be used as cover by prey away from the vicinity of wind turbines;

[4] Noxious weeds are defined as plants that are injurious to public health, the environment, public roads, crops, livestock, or other property under the Minnesota Noxious Weed Law (MN Statues 18.75-18.91). A list of noxious weeds that require eradication, control, or restriction can be found at www.mda.state.mn.us/weedcontrol.

  - procedures for handling carrion discovered on or near Project facilities that will minimize attracting predators/scavengers such as raptors and vultures;
  - a Wildlife Response and Reporting System to establish protocols for identifying and communicating bird and bat fatalities; and
  - procedures to train staff on the Wildlife Response and Reporting System.
- Turbine blades will be locked or feathered, up to the manufacturer's standard cut-in speed, from ½ hour before sunset to ½ hour after sunrise, from April 1 to October 31, of each year of operation throughout the life of the Project.
- All turbines at the Project will be equipped with operational software that is capable of allowing for adjustment of turbine cut-in speeds.

3.2.2 Avoidance of Native Plant Communities

The Project turbines will be located primarily on cultivated agricultural lands, minimizing or eliminating most construction-related wildlife impacts. Native plant communities (e.g., native prairies, calcareous fens) will be avoided during siting and construction of all permanent aboveground Project infrastructure. To the extent possible, the Project layout has been designed to use the existing public and private road network and to minimize the clearing of trees and the disturbance of other natural habitats (e.g., wetlands, grasslands) during Project construction. Further details on methods committed to by the Company to avoid impacts to native prairies will be addressed in a *Native Prairie Protection and Management Plan*. The Company will coordinate with the MNDNR and MNDOC on the *Native Prairie Protection and Management Plan*, which will be finalized prior to construction.

3.2.3 Construction Personnel Training

All construction personnel will be trained to identify potential wildlife conflict situations and proper responses. This training will include awareness of nesting birds and other wildlife that may be encountered. For example, if an unknown bird nest is encountered by construction personnel, they will be instructed to stop work in the area and contact the Environmental Manager. The Environmental Manager will assess the situation and work with construction personnel to implement a plan for continuing construction to avoid or minimize impact to the nest. If other protected wildlife resources are encountered, a similar course of action will be followed; construction will cease until the Environmental Manager can determine an appropriate plan to allow construction to continue without causing an adverse impact. Additionally, training will include education on the standard measures to be followed during construction to minimize wildlife impacts, including:

- Industry-standard best management practices will be implemented to protect topsoil and adjacent resources and to minimize soil erosion.
- All surface-disturbed areas will be restored to the approximate original contour and reclaimed in accordance with easement agreements.
- Removal or disturbance of vegetation will be minimized through site management (e.g., by utilizing previously disturbed areas, designating limited equipment/materials storage yards and staging areas, scalping) and reclaiming all disturbed areas not required for operations.

- Speed limits on Project access roads (25 miles per hour [40 km per hour]) will be followed to minimize wildlife mortality due to vehicle collisions.
- Travel will be restricted to designated roads and corridors, except in emergencies.
- All areas that are identified as avoidance areas in the LWECS Site Permit (such as native prairie) or other regulations such as state and federal wetland regulations will be identified on maps, and no impacts will occur unless specifically allowed by the LWECS Site Permit or appropriate wetland permits. Any conditions that are required as part of permitted crossings will be followed, including minimization of the disturbance footprint, reseeding using approved seed mixtures, etc.
- Construction activities will be performed using standard construction best management practices so as to minimize the potential for accidental spills of solid material, contaminants, debris, and other pollutants. Excavated material or other construction materials will not be stockpiled or deposited near or on stream banks.
- No burning or burying of waste materials will occur at the Project site. All contaminated soil and construction debris will be removed and disposed of in approved landfills in accordance with appropriate environmental regulations.
- All employees and contractors will follow federal and state measures for handling toxic substances to minimize contamination of water and wildlife resources.
- Parts and equipment that may be used as cover by prey will not be stored for longer than 30 days in the vicinity of wind turbines.
- Carrion will be monitored for and quickly removed to the extent practicable (e.g., big game, domestic cattle, road kill) from the wind energy facility to avoid attracting predators/scavengers such as raptors and vultures.

The training and communications protocol, as well as other environmental and permitting requirements for the Project during construction, will be outlined in a Construction Environmental Management Plan that the Company will develop prior to any onsite activities.

4 POST-CONSTRUCTION: TIER 4

According to the WEG, “during post-construction tiers (including Tier 4), developers are assessing whether actions taken in earlier tiers to avoid and minimize impacts are successfully achieving the goals and, when necessary, taking additional steps to compensate for impacts” (USFWS 2012). The specific questions to be investigated in Tier 4 are:

1. What are the bird and bat fatality rates for the project?
2. What are the fatality rates of species of concern?
3. How do the estimated fatality rates compare to the predicted fatality rates?
4. Do bird and bat fatalities vary within the project site in relation to site characteristics?
5. How do the fatality rates compare to the fatality rates from existing projects in similar landscapes with similar species composition and use?
6. What is the composition of fatalities in relation to migrating and resident birds and bats at the site?

7. Do fatality data suggest the need for measures to reduce impacts?

After the field surveys and analysis are completed in accordance with the protocol described below, the Company will review the efforts and make a determination pursuant to the WEG "Decision Framework for Tier 4a Fatality Monitoring" (USFWS 2012) to determine the need for further monitoring or if any measures are needed to reduce impacts.

4.1 Formal Avian and Bat Fatality Monitoring

Impacts to avian and bat species are anticipated to be within the overall range of other Minnesota and Midwestern facilities. To confirm this, the Company proposes to implement a formal avian and bat fatality monitoring study. Fatality monitoring will provide information on the impact of the Project on birds and bats and give an indication if any specific turbines or Project facilities are responsible for a significant proportion of fatalities. The objective of the monitoring will be to determine if the avian and bat fatality rates are lower, similar to, or higher than other Minnesota, regional and national studies.

Fatality monitoring will begin after all the turbines have been commissioned and are fully operational, and will be conducted by a third-party biologist. The duration and intensity of carcass searches, the number of selected turbines, and the levels of searcher efficiency and carcass removal trials are consistent with general wind industry standard practices and the recommendations from with the MNDOC, MNDNR, and USFWS, and will follow the protocols for a moderate risk site as described in the *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* (MNDNR and MNDOC 2014). A detailed discussion of each of the major fatality monitoring components is in the following sections.

4.1.1 Survey Period

Formal carcass searches will be conducted for a minimum of one year. The search frequency will be two days per week for cleared plot search areas from March 15 through November 15. The following dates will be used for defining seasons in the study during monitoring:

- Spring: March 15 – May 14
- Summer: May 15 – July 31
- Fall: August 1 - November 15

At this time, no winter fatality monitoring is proposed. The Company proposes to complete one year of formal fatality monitoring (including the Spring, Summer, and Fall seasons). If high fatalities are found during the first year, the Company will consider a second year of monitoring.

4.1.2 Turbine Selection Method

The MNDNR's recommended post-construction protocol for moderate risk sites states that twenty percent of turbines should be searched (with a minimum of 10 and a maximum of 25 depending on the number of turbines). The avian and bat fatality monitoring will include a search of a subset of turbines selected to provide representative coverage throughout the

Project. For this Project, the Company proposes that 10 cleared plots centered at a turbine will be searched. The turbines selected for cleared plots will be selected by the third-party biologist. The cleared plot turbines will be selected to maximize the spatial extent within the Project layout, and may also take into account turbines that may be located relatively near to habitat features such as riparian areas or other resources, in order to have the ability to detect potential issues raised in comments by the MNDNR.

4.1.3 Search Methods

The objective of the standardized carcasses searches is to systematically search plots centered on turbines for bat and bird casualties that are attributable to collision with project facilities.

The cleared search plots will consist of an area of 393 x 393 ft (120 x 120 m) centered on the turbine. A searcher will walk at a casual walking rate of approximately 148 to 197 ft (45 to 60 m) per minute through the search area. For the cleared plots, the searcher will scan the area on both sides of each search transect, which will be spaced 20 ft (6 m) apart. At each search plot, the following data will be recorded: date; start time; end time; observer; and the turbine number. When a bat or bird carcass is found during a search, the searcher will place a metal pin flag or similar marker at the carcass and finish searching the plot. After the plot has been completely searched, the searcher will return to each carcass and record information on a fatality data sheet, including date, species, sex and age (when possible), observer name, turbine number, distance from turbine (meters), azimuth from turbine, Universal Transverse Mercator [UTM] coordinates, habitat surrounding carcass, visibility class, condition of carcass (intact, partial, scavenged), and estimated time of death (e.g., <1 day, 2 days). Digital photographs will be taken of all carcasses, any injuries, and surrounding habitat. Gloves will be used to handle all carcasses to minimize disease transmission and reduce potential of leaving human scent on carcasses which can bias future carcass detection and removal trials.

4.1.4 Injured Wildlife Handling and Reporting Protocol

All injured raptors or federally or state-listed bird species, and federally-listed bats will be promptly delivered to an appropriate rehabilitation center or other approved facility as specified in state and federal permits; or as directed by necessary law enforcement personnel. All other injured bird and bat species will be left in place or moved to an appropriate on-site location for possible recovery.

Appropriate wildlife salvage/collection permits will be sought from the MNDNR and USFWS, as required. Dissemination of data (e.g., to the USFWS Special Agent and other agency representatives) will be done in accordance with permit requirements.

4.1.5 Incidental Finds Outside of Formal Searches

Casualties found outside the formal search area by carcass searchers will be documented in accordance with the standard survey protocol as closely as possible. Casualties found in non-search areas (e.g., near a turbine not included in the search area for that day) will be coded as

incidental discoveries and will be documented in a similar manner as those found during standard searches, but not included in the analysis.

4.1.6 Weather Monitoring

Weather conditions will be documented during each survey period, including cloud cover, temperature, and wind direction and speed at the time of survey.

4.1.7 Carcass Information

The condition of each carcass found will be recorded using the following categories:

- Intact – a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger;
- Scavenged – an entire carcass, which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location (e.g., wings, skeletal remains, legs, pieces of skin, etc.); or
- Feather Spot - 10 or more feathers at one location indicating predation or scavenging.

In addition to carcasses, all injured birds or bats observed in search plots or elsewhere in the Project area (e.g., near a turbine not included in the search area) will be recorded and treated as a fatality for analysis purposes (if found in search plots) or as an incidental find if found outside the search plot. The injured birds and bats will be handled in accordance with the procedures specified in Section 4.1.4.

4.1.8 Searcher Efficiency Trials

The objective of the searcher efficiency trials is to estimate the percentage of casualties which are found by searchers. Trials will be conducted during each season. Estimates of searcher efficiency will be used to adjust the total number of carcasses found for those missed by searchers and correcting for detection bias.

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. A minimum of 75 carcasses distributed approximately evenly among size classes, will be used for searcher efficiency trials each season. Searcher efficiency carcasses will include: commercially available species, such as dark hopper-sized house mice (approximately two to three week old weaned mice) as bat surrogates; house sparrows and two week old northern bobwhite quail for small birds; rock pigeons, ring-necked pheasants for large birds; and possibly turkey decoys with a harness of real feathers for eagle surrogates. As bat carcasses can be difficult to obtain, small bird searcher efficiency or mice may be used as surrogates. As the study progresses, if bat carcasses are found they will be incorporated into the searcher efficiency trials for later seasons.

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.

4.1.9 Carcass Persistence Trials

The objective of carcass persistence 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. Carcass persistence studies will be conducted during each season (i.e., spring, summer, and fall) to adequately cover seasons and vegetation conditions. Estimates of carcass persistence will be used to adjust the total number of carcasses found for those removed from the study area, correcting for removal bias.

Carcass persistence trials will begin when carcass search studies begin. A minimum of 50 carcasses per season and size class will be used for carcass persistence trials. Surrogate large bird carcasses will consist of raptors, if available and the appropriate permits are acquired, black domestic turkeys, hen ring-necked pheasants, rock doves, and/or hen mallards; surrogate small birds will include house sparrows or two week old quail; and surrogate bats will include mice or bats found and collected previously during the plot searches.

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 four 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 persistence 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, measures to address this will be developed so that additional uncertainty is not added into the analysis unnecessarily. These measures may include increasing search frequency or, if avian scavengers are suspected of removing carcasses, placing carcasses at night (i.e., some avian predators that are active during the day may cue in on and remove carcasses immediately after placement). The frequency of the standardized searches may be increased if carcass persistence 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.

4.1.10 Estimation of Fatality

Fatality estimation is a complex task due to a number of variables present in every study. Fatalities occur at an unknown rate, persist for variable amounts of time, and can be detected with varying levels of success based on carcass characteristics and ground cover. To account for these variables, fatality rate estimation methods have been developed.

Estimates of facility-related fatalities are based on:

- Observed number of carcasses found during standardized searches throughout the monitoring year for which the cause of death is either unknown or is probably facility-related;
- Persistence rates expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during persistence trials;
- Searcher efficiency expressed as the proportion of planted carcasses found by searchers during searcher efficiency trials; and
- Search area adjustment based on the area searched and carcass density.

Annual and, if necessary, seasonal fatality estimates will be provided for the following groups: all birds; small birds; large birds; raptors; eagles; and bats, if appropriate. The total number of fatalities in each of these groups will be estimated by adjusting for carcass persistence, searcher efficiency rates, and density-weighted search area using a fatality estimator model. A minimum of two modern estimators will be used in order to compare fatality results.

4.2 Incidental Monitoring

4.2.1 Training of On-Site Staff

Operations personnel will be trained to identify potential wildlife conflicts and the proper response. This training will include an awareness of potential avian and wildlife fatalities caused by operation of the facility. An incidental reporting process will be developed for operations personnel ensuring they can document bird or bat casualties during routine maintenance work and at other times they are within the Project area. Incidentally found wildlife will be reported according to LWECS Site Permit requirements for the life of the Project.

4.2.2 Injured Wildlife Handling and Reporting Protocol

Any injured wildlife observed during operations of the Project will be left in place until the Company's primary biological/ecological representative has been contacted. The Company will then decide the most appropriate course of action depending on the condition and species of injured animal discovered.

4.2.3 Primary Biologist/Ecologist Contact

The contact information for the Company's primary biological/ecological representative is included in Section 7.4.

4.3 Post-Construction Results and Recommendations Reporting Protocol

The Company will prepare an annual report summarizing the results of the monitoring and assessment completed as described in Sections 4.1 and 4.2. This report will be submitted to the MNDOC, MNDNR, and USFWS by December 31 of each year.

Specific to the formal avian and bat fatality monitoring, the report will include turbine-specific information on found carcasses along with estimated fatality rates for birds and bats. Fatality estimates will be calculated for bats, all birds, and raptors, at a minimum. Seasonal estimates for both birds and bats will also be reported. Estimated fatality rates will be calculated using the total number of carcasses found along with data from searcher efficiency and carcass removal trials. The annual report will include the estimated bat fatalities per MW, as well as a facility-wide bat fatality estimate on an annual and operational lifespan scale for the Project. The report will include an analysis that provides a comparison of fatality estimates, searcher efficiency, and scavenger removal rates between the cleared plots and road and pad searches. Additionally, the report will include information on the results from incidental monitoring.

In addition to the summary report that will be completed after the post-construction monitoring, The Company will provide the necessary quarterly and annual incident reports to the MNDOC, MNDNR, and USFWS, identifying recommendations for next steps. Data from these Tier 4 studies will be one component in implementing the adaptive management portion of this ABPP (see Section 6.0).

4.4 Post-construction Agency Coordination

Within three months of completing the Tier 4 study fieldwork, the Company will communicate the results of the Tier 4 studies to the MNDOC, MNDNR, and USFWS discuss potentially significant issues, and notify these agencies of any adaptive management strategies it plans to implement as a result of these studies.

5 RESEARCH: TIER 5

In addition to Tiers 1 through 4 described above, the WEG contains a Tier 5 *Other Post-Construction Studies*. In general, the studies identified in Tier 5 are research-related and "will not be necessary for most wind energy projects." Results from the Tier 4 studies will be reviewed to determine the necessity for Tier 5 studies, which is not currently anticipated for this Project.

6 ADAPTIVE MANAGEMENT AND OPERATIONS MEASURES

Within the WEG, the USFWS 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 if they are sited in accordance with the tiered approach. Nevertheless, the Company recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, the Company has incorporated an adaptive approach for the conservation of wildlife potentially impacted by the Project.

Section 2.0 of this BBCS describes the tiered approach used to study wildlife conditions and predict Project impacts. Based on Project siting decisions made in response to pre-construction monitoring actions (e.g., turbines sited away from bald eagle nests and sensitive habitats), and results to date of overall biological monitoring, 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 the region (Tables 5 and 6). Publicly available studies from Minnesota suggest the range of estimated fatality rates is 0.27 to 5.93 birds/MW/year and 0 to 0.47 raptors/MW/year. Based on publicly available studies in Minnesota, the anticipated fatality rate for bats ranges from 0.74 to 15.85 bats/MW/year, with a mean of 3.65 bats/MW/year (Table 7). To confirm the anticipated impacts, post-construction fatality surveys will be conducted after the facility is fully functioning using a third-party biologist according to the methods set forth in Section 4.

Table 5. Wind energy facilities in Minnesota with fatality data for all bird species.

Wind Energy Facility	Fatality Estimate[A]	No. of Turbines	Total MW
Buffalo Ridge, MN (Phase III; 1999)	5.93	138	103.5
Moraine II, MN	5.59	33	49.5
Buffalo Ridge, MN (Phase I; 1996)	4.14	73	25.0
Elm Creek II, MN	3.64	62	148.8
Buffalo Ridge, MN (Phase I; 1999)	1.43	73	25.0
Buffalo Ridge, MN (Phase II; 1999)	3.57	143	107.25
Buffalo Ridge, MN (Phase I; 1998)	3.14	73	25.0
Buffalo Ridge, MN (Phase I; 1997)	2.51	73	25.0
Buffalo Ridge, MN (Phase II; 1998)	2.47	143	107.25
Elm Creek, MN	1.55	67	100.0

A=number of bird fatalities/MW/year
Data from the following sources:

Facility	Fatality Estimate	Facility	Fatality Estimate
Buffalo Ridge, MN (Ph. III; 99)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. I; 98)	Johnson et al. 2000
Moraine II, MN	Derby et al. 2010b	Buffalo Ridge, MN (Ph. I; 97)	Johnson et al. 2000
Buffalo Ridge, MN (Ph. I; 96)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. II; 98)	Johnson et al. 2000
Elm Creek II, MN	Derby et al. 2012	Elm Creek, MN	Derby et al. 2010a
Buffalo Ridge, MN (Ph. II; 99)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. I; 99)	Johnson et al. 2000

Table 6. Wind energy facilities in Minnesota with fatality data for raptors.

Wind Energy Facility	Raptor Fatality Estimate[A]	No. of Turbines	Total MW
Buffalo Ridge, MN (Phase I; 1996)	0.47	73	25.0
Moraine II, MN	0.37	33	49.5
Buffalo Ridge, MN (Phase I; 1997)	0	73	25.0
Buffalo Ridge, MN (Phase I; 1998)	0	73	25.0
Buffalo Ridge, MN (Phase I; 1999)	0	73	25.0
Elm Creek, MN	0	67	100.0
Buffalo Ridge, MN (Phase III; 1999)	0	138	103.5
Buffalo Ridge, MN (Phase II; 1998)	0	143	107.25
Buffalo Ridge, MN (Phase II; 1999)	0	143	107.25
Elm Creek II, MN	0	62	148.8

A = number of fatalities/MW/year
Data from the following sources:

Facility	Fatality Estimate	Facility	Fatality Estimate
Buffalo Ridge, MN (Ph. I; 96)	Johnson et al. 2000	Elm Creek, MN	Derby et al. 2010a
Moraine II, MN	Derby et al. 2010b	Buffalo Ridge, MN (Ph. III; 99)	Johnson et al. 2000
Buffalo Ridge, MN (Ph. I; 97)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. II; 98)	Johnson et al. 2000
Buffalo Ridge, MN (Ph. I; 98)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. II; 99)	Johnson et al. 2000
Buffalo Ridge, MN (Ph. I; 99)	Johnson et al. 2000	Elm Creek II, MN	Derby et al. 2012

Table 7. Wind energy facilities in Minnesota with fatality data for bats.

Wind Energy Facility	Fatality Estimate[A]	No. of Turbines	Total MW
Lakefield, MN (2012)	15.85	137	205.5
Big Blue, MN (2013)	6.33	18	36.0
Buffalo Ridge, MN (Phase II; 2001/Lake Benton I)	4.35	143	107.25
Buffalo Ridge, MN (Phase III; 2001/Lake Benton II)	3.71	138	103.5
Grand Meadows, MN (2013)	3.11	67	100.5
Oak Glen, MN (2013)	3.09	24	44.0
Elm Creek II, MN (2011-2012)	2.81	62	148.8
Buffalo Ridge, MN (Phase III; 1999)	2.72	138	103.5
Buffalo Ridge, MN (Phase II; 1999)	2.59	143	107.25
Moraine II, MN (2009)	2.42	33	49.5
Buffalo Ridge, MN (Phase II; 1998)	2.16	143	107.25
Buffalo Ridge, MN (Phase III; 2002/Lake Benton II)	1.81	138	103.5
Buffalo Ridge, MN (Phase II; 2002/Lake Benton I)	1.64	143	107.25
Elm Creek, MN (2009-2010)	1.49	67	100.0
Buffalo Ridge, MN (Phase I; 1999)	0.74	73	25.0

A = Number of fatalities per megawatt per year
Data from the following sources:

Facility	Fatality Estimate	Facility	Fatality Estimate
Buffalo Ridge, MN (Ph. II; 01/Lake Benton I)	Johnson et al. 2004	Buffalo Ridge, MN (Ph. II; 98)	Johnson et al. 2000a
Buffalo Ridge, MN (Ph. III; 01/Lake Benton II)	Johnson et al. 2004	Buffalo Ridge, MN (Ph. III; 02/Lake Benton II)	Johnson et al. 2004
Elm Creek II, MN	Derby et al. 2012	Buffalo Ridge, MN (Ph. II; 02/Lake Benton I)	Johnson et al. 2004
Buffalo Ridge, MN (Ph. III; 99)	Johnson et al. 2000	Elm Creek, MN	Derby et al. 2010c
Buffalo Ridge, MN (Ph. II; 99)	Johnson et al. 2000	Buffalo Ridge, MN (Ph. I; 99)	Johnson et al. 2000
Moraine II, MN	Derby et al. 2010b		

6.1 Unexpected Avian, Bat, and/or Habitat Impacts

Based on the results of the Tier 4 monitoring program described in Sections 4.1 through 4.3, adaptive management measures could be considered to further avoid, minimize, or compensate for unanticipated and significant Project impacts to wildlife. Thresholds for considering an adaptive response will include:

- mortality of an eagle or mortality of a species listed as endangered/threatened under the federal Endangered Species Act or Minnesota's Endangered Species Statute. Note that the final 4(d) ruling for the northern long-eared bat currently exempts wind energy projects from incidental take of this species during operation. Any documented northern long-eared bat mortality will be reported to the USFWS and MNDOC, but no adaptive management measures are proposed given the current 4(d) rule. If the status of the northern long-eared bat is downgraded, or the 4(d) rule is changed, the Company will update this BBCS and adaptive management measures as appropriate; or

- significant levels of mortality of unlisted species of birds or bats. Significance will be determined by qualified biologists and will be based on the latest information available, including the most recent data on species' population sizes and trends. For example, even relatively high levels of mortality of the most common species may not be significant. Conversely, lower levels of mortalities of less common species may be of more concern, particularly if these species appear to be at risk (e.g., USFWS Birds of Conservation Concern).

As addressed above, bat mortality at the Project is expected to be within the range reported for other wind projects in Minnesota. In particular, the Company's commitment to operation measures, including feathering turbine blades up to the manufacturer set cut-in speed at night from April 1 through October 31, is expected to minimize impacts to bats.

Because the Project is not expected to result in significantly higher bat mortality than has been observed in Minnesota to date as well as the fact that there is a general lack of data on unlisted bat populations to determine a specific threshold that would indicate potential for significant impacts, specific adaptive management thresholds regarding general bat fatality rates are not proposed. However, during the post-construction monitoring period, the Company will notify the MNDOC and MNDNR of bat fatality rates at the time of annual monitoring report submittal. Per the MNDNR's recommendations, the annual report will include the estimated bat fatalities per MW, as well as a facility-wide bat fatality estimate on an annual and operational lifespan scale for the Project. Additionally, if five or more dead or injured bats are found in a five-day period, the MNDOC will be notified within 24 hours.

The Company will coordinate with the MNDNR and MNDOC regarding annual bat fatality rates as well as if five or more dead or injured bats are found in one five day period. The Company will investigate, based on the available data, the circumstances under which the fatalities occurred, the species affected, and whether population-level impacts may be occurring. The Company will coordinate with the MNDNR and MNDOC regarding the conclusions of the investigation and discuss whether the implementation of potential minimization measures (e.g., operational changes) and/or mitigation measures (e.g., reduce non-Project sources of mortality for the affected species) may be appropriate.

Following the implementation of remedial actions, if necessary, the Company will calculate estimates of non-listed bat fatality rates from the monitoring data collected at the Project for at least one subsequent year to evaluate the effectiveness of the adaptive management measures.

After the intensive post-construction monitoring period, incidental monitoring will be used to continue to monitor impacts to bats over the life of the Project. Bat carcasses will be reported regularly to the Company's environmental staff and/or site manager. Quarterly reports will be submitted to the MNDOC for the life of the Project, identifying any dead or injured bat species found, as well as location and date. If at any point over the life of the Project, five or more dead or injured bats are detected within a five-day period, the Company will notify the MNDOC within 24 hours; if federally listed species are affected, the USFWS will also be notified. As described above, the Company will then investigate, based on the available data, the circumstances under which the event occurred, the species affected, and whether population-level impacts may be occurring. The Company will coordinate with the MNDOC and MNDNR regarding the conclusions of the investigation and discuss the implementation of potential minimization measures (e.g., operational changes) and/or mitigation measures (e.g., reduce non-Project sources of mortality for the affected species).

6.2 Additional Mitigation Needs

As described in Section 4, if the impacts observed in the first year of monitoring represent a significant impact to wildlife, the second year of post-construction fatality monitoring could be modified to provide further information to be used in implementing adaptive management measures. This second year would likely focus on the significant impacts identified for species of concern. For example, if it is found that the bat fatalities at the Project are significant based on analysis of the post-construction fatality data, a second year of fatality monitoring could be done that focuses on the time period when bats were found as fatalities in year one (e.g., July-October). The same protocol as stated above would be used for searches but with a focus on a concentrated search period and reduced plot sizes to narrow the search to the area where bat carcasses are most likely to be found (e.g., closer to the turbines).

Some of the adaptive management measures options that could be considered depending on the results of the post-construction mortality monitoring and taking into account economic feasibility[5] include:

- regular removal of livestock or big game carcasses from Project area;
- prey-base habitat management (e.g., removal of rock/brush piles found in proximity to turbines);
- installation or modifications of anti-perching, anti-nesting devices, or electrocution protection devices on "problem" Project facilities; or

[5] Once a project is operational there is a fixed amount of capital expenditure and the only available source of funding is from operational budgets, which must be within the economic parameters of the Project.

- operational minimization (e.g., feathering, modified operations from sundown to sunrise, alteration of cut-in speeds).

6.3 Action Plan Should New Risks Arise

In addition to adaptive management triggered based on the results of the post-construction mortality studies, additional adaptive measures will be considered as a result of other studies or incidental wildlife observations during Project operations. Operations staff will also be trained to implement an incidental wildlife reporting protocol (Section 4.2). The Company will communicate the results of this monitoring and discuss any further decisions regarding the scope of additional survey efforts (if needed) or adaptive management with the agencies.

There may be other scenarios where new risks require additional measures: finding an eagle roost or nest location, for example, that dictate a need for individual turbines to be monitored more closely for use and fatalities. The intent of monitoring is to document changes in use (e.g., higher use) in a timely manner such that management changes (e.g., removal of prey sources) or operations changes can be implemented and potential wildlife impacts can be minimized.

Finally, the Company will consider implementing adaptive management measures if the status of any species potentially impacted by the Project changes, such as if any species become listed under federal or state protected species regulations, or the status of a species is changed.

6.3.1 Agency Correspondence

Prior to implementing any new action plan or major modification to this BBCS, the Company will consult with the MNDOC, MNDNR, and USFWS.

7 IMPLEMENTATION OF THE BBCS

7.1 Document Availability

This BBCS will be maintained by the Company's environmental representative and a copy BBCS will be kept on-site throughout operations of the Project.

7.2 Annual Audits

The Company will, by March 15 following each complete or partial calendar year of operation, file with the PUC an annual report detailing findings of its annual audit of BBCS practices. The annual report will include summarized and raw data of bird and bat fatalities and injuries and will include bird and bat fatality estimates for the Project using agreed-upon estimators from the prior calendar year. The annual report will also identify any deficiencies or recommended changes in the operation of the Project or in the BBCS to reduce avian and bat fatalities and will provide a schedule for implementing the corrective or modified actions. The Company will provide a copy of the report to the MNDNR and the USFWS at the time of filing with the PUC.

7.3 Reporting

In accordance with the LWECS Site Permit, the Company will provide quarterly wildlife incident reports to the PUC, MNDNR, and USFWS for the life of the Site Permit.

Furthermore, the Project owner and the PUC, MNDNR, and the USFWS will be notified within twenty-four (24) hours of the discovery of any of the following:

- five or more dead or injured non-listed or migratory avian or bat species within a five-day period; or
- one or more dead or injured state threatened, endangered, or species of special concern; or
- one or more dead or injured federally listed species, including species proposed for listings; or
- one or more dead or injured bald or golden eagles.

7.4 Primary Contact

Key resource personnel associated with this BBCS include the following:

- The Company's Primary Environmental Representative: Sean Flannery, Renewable Energy Systems Americas, Inc.
  - Office: (612) 455-8449
  - Cell: (651) 338-5986
  - Email: sean.flannery@res-americas.com

- U.S. Fish and Wildlife Service: Margaret Rheude
  - Office: (612) 725-3548 ext. 2202
  - Email: Margaret_Rheude@fws.gov

- U.S. Fish and Wildlife Service Law Enforcement:
  - Office: USFWS Law Enforcement – St. Paul Station
  - Contact: (651) 778-8360

- Minnesota Department of Natural Resources: Kevin Mixon
  - Office: (507)359-6000
  - Email: kevin.mixon@state.mn.us

- Minnesota Department of Commerce: Suzanne Steinhauer
  - Office: (651) 539-1843
  - Email: suzanne.steinhauer@state.mn.us

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Appendix A: Agency Communication Records

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
Division of Ecological and Water Resources
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MNDNR

May 3, 2016

Sean Flannery
Renewable Energy Systems Americas Inc.
330 2nd Avenue South, Suite 820
Minneapolis, MN 55401

Subject: Bitter Root Large Wind Energy Conversion System (LWECS)
DNR Preliminary Review
Yellow Medicine County, MN

Dear Mr. Flannery:

The Minnesota Department of Natural Resources (MNDNR) appreciates the opportunity to review and comment on the proposed Bitter Root Large Wind Energy Conversion System. When compared to most other wind projects in southern Minnesota this project area contains a significant amount of habitat within and adjacent to the project area. Native prairie, lakes, wetlands (including calcareous fens), streams, grassland, and pasture are prevalent throughout the project area. In addition, bat roosting potential exists along the forested portions of streams as well as the groves of trees found around home sites. Some of the trees are old enough for lose bark, have died, or are damaged and they have the loose bark conditions or fissures that bats use for summer roosting. As such, the MNDNR believes this site poses a high risk to wildlife, especially bats.

The MNDNR recommends the following four strategies be considered in order to minimize the potential impacts:

1) Consider developing a LWECS at a more appropriate location that does not contain as much habitat for birds and bats.
2) Consider expanding the project boundary into areas that are lower risk than some of the area that has been proposed.
3) Consider developing a smaller size project that is lower in MW that will result in a reduction of turbines that can be sited more appropriately.
4) Use higher MW rated turbines in order to reduce the number of turbines. Fewer turbines results in less access roads, transmission lines, collector lines, and crane paths. The use of fewer turbines ultimately results in a reduction in impacts to natural resources.

Please review the "DNR Guidance for Commercial Wind Energy Projects" and "Avian and Bat Survey Protocols For Wind Energy Projects" for our standard commercial wind project recommendations. Both of the guidance documents can be located at the following web link: (http://www.dnr.state.mn.us/eco/ereview/additional_resources.html). The MNDNR Guidance For Commercial Wind Energy Projects should be reviewed and considered throughout project development. The following specific sections are known to pertain to this project area: Rare Species and Native Plant Communities, Native Prairies, Public Conservation and Recreation

Lands, Properties in Government Programs or With Conservation Easements, and Lakes, Wetlands, Streams, and Rivers.

The MNDNR recommends that scientifically rigorous fatality monitoring be conducted for this project. Please review the Avian and Bat Survey Protocols on the MNDNR website (http://www.dnr.state.mn.us/eco/ereview/additional_resources.html) in order to develop a specific fatality monitoring plan. The fatality monitoring plan should be included in the PUC required Avian and Bat Protection Plan (ABPP) as it will be a key component to assess project impacts. As a high risk site, the DNR recommends a minimum of 2 years of fatality monitoring using scientifically valid protocols.

The MNDNR will be recommending that the PUC Site Permit include a requirement for feathering turbine blades when operating below the cut-in speed for the life span of the project. Arnet et al. (2013) describes one project that discovered feathering turbine blades at or below the manufacturer's cut-in speed resulted in up to 72% fewer bats killed when turbines produced no electricity into the power grid (link attached). The American Wind Energy Association (AWEA) and other states, i.e. Nebraska, have already recommended feathering of turbine blades to reduce bat fatalities. AWEA expects feathering of the blades to reduce impacts to bats from operating wind turbines by as much as 30 percent. Feathering turbine blades below the cut-in speed is likely to reduce bat fatalities/bat fatality estimates and decrease the need for additional operational mitigation.

If bat fatalities are high, despite feathering of the blades, then operational mitigation such as raising the cut-in-speed will need to be discussed as a mechanism to reduce fatalities. Raising the cut-in-speed has been shown to significantly reduce bat fatalities at numerous commercial wind facilities. Arnet et al. (2013) provided a synthesis of operational mitigation studies to reduce bat fatalities at 10 different wind projects. Most of the studies found that at least a 50% reduction in bat fatalities occurs when turbine cut-in speed was increased by 1.5 m/s above the manufacturer's cut-in speed. They also concluded that changing the cut-in speed offers an ecologically sound and economically feasible strategy for reducing bat fatalities at wind energy facilities. The MNDNR is indicating a potential need for operational mitigation early in the process so the project proponent can make decisions on turbine placement that may minimize bat fatalities and to factor in the possibility of future operational mitigation if high bat fatalities occur.

The Adaptive Management section of the PUC Site Permit should also include information on other factors that may influence the need for operational changes. Factors including but not limited to bat species killed, turbine specific fatalities, and a facility wide bat fatality estimate. The ABPP should include a specific list of options that can be deployed to reduce bat fatalities, if necessary. Monitoring for effectiveness of the operational changes would also be needed to determine their ability to reduce bat fatalities.

Calcareous fens are known to occur within the project boundary and they may occur at other unidentified locations. Calcareous fens must not be impacted or otherwise altered or degraded, wholly or partially, by any action, unless the commissioner, under an approved management plan, decides some alteration is necessary (Wetland Conservation Act Rules 8420.0935). Calcareous fens will need to be identified so they can be avoided. Avoidance would apply to all

infrastructure associated with the project including but not limited to: turbines, access roads, collector lines, transmission lines, crane paths, and temporary construction areas. Please be advised that avoidance is not only related to direct impacts, but also to any type of construction that could alter their hydrology or degrade water quality.

The MNDNR will need to be provided with the wetland delineation report and infrastructure layout map as soon as they are available. Wetland surveys need to be conducted by consultants experienced in the identification of calcareous fens and the rare plants associated with them. The consultants should be on the DNR List of Surveyors (see attached documents). The MNDNR calcareous fen identification criteria must be used and the surveyor must be able to identify rare plants associated with the scoring criteria. Surveys must occur in June and August in order to positively identify the rare plants as they are difficult to locate outside of their flowering period.

The Sioux Nation, Bohemian, Saum Memorial, Penthole, Minn-kota, Tatley, and Archerville Wildlife Management Areas (WMA) are within or adjacent to the project boundary with several of them containing multiple parcels. The MNDNR recommends that no direct impacts occur to these public recreational lands from turbine construction, transmission lines, substations, or road networks associated with the project. It is the MNDNR's responsibility to seek avoidance, minimization, and mitigation for potential impacts to Minnesota Recreation System Units (Minnesota Statutes, chapter 86A) from turbine construction, transmission lines, substations, or road networks associated with a wind project. The wind resource of State lands is protected from encroachment through the wind access buffer of 5 rotor diameters (prevailing wind direction) and 3 rotor diameters (non-prevailing wind direction) that has been established by the Public Utilities Commission (PUC) to protect non-participating landowners wind rights.

Also within the project boundary is a Waterfowl Production Area (WPA) that is managed by the United States Fish & Wildlife Service (USFWS). Further coordination should occur with the USFWS concerning potential impacts to the WPA. Rare butterflies are also known to occur within the project boundary and discussions should occur with the USFWS concerning this resource.

Issues concerning rare features should be identified and resolved prior to submitting the Site Permit Application to the PUC. To receive information regarding rare features and species in the vicinity of the proposed project, the wind developer or their consultants should submit a completed Natural Heritage Information System (NHIS) Data Request Form (http://files.dnr.state.mn.us/eco/nhnrp/nhis_data_request.pdf) to the MNDNR Endangered Species Review Coordinator. The Natural Heritage Review will identify known occurrences of rare plants, animals, and native plant communities in the vicinity of the project boundary. Please note that some NHIS data is available as GIS shapefiles and can be downloaded at no cost from the Minnesota Geospatial Commons at http://gisdata.mn.gov. These include the following shapefiles: MNDNR Native Plant Communities, Calcareous Fens, and MBS Sites of Biodiversity Significance. The MNDNR recommends avoidance of these significant natural areas and encourages the use of this data to identify areas within a project boundary that would not be appropriate for development. Please contact the Endangered Species Review Coordinator at 651-259-5109 for more information on the Natural Heritage Review process.

During development of the turbine layout it is recommended that 5-6 alternate turbine locations be included. The alternate turbine locations provide an opportunity to avoid or minimize potential impacts to natural resources and to work around other issues that arise during project development.

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

Sincerely,

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

ec: Lisa Joyal, Endangered Species Review Coordinator
Jamie Schrenzel, Environmental Review
Jim Sehl, EWR Assistant Supervisor
Ryan Bjerke, Area Hydrologist
Skip Wright, North District EWR Supervisor
Wendy Krueger, Area Wildlife Manager
Jeremy Losinski, Parks and Trails
Chris Domeier, Fisheries
DNR R4 REAT
Margaret Rheude, USFWS
Richard Davis, Department of Commerce-EERA
ERDB#20080705

Links:

A Synthesis Of Operational Mitigation Studies To Reduce Bat Fatalities At Wind Energy Facilities In North America (Arnet et al. 2013):

http://www.batsandwind.org/pdf/Operational%20Mitigation%20Synthesis%20FINAL%20REPORT%20UPDATED.pdf

Bat Assessment Guidance for Wind Energy Facilities in Nebraska:

http://snr.unl.edu/renewableenergy/download/Bat%20Assessment%20Guidance%20for%20Wind%20Energy%20Facilities%20in%20Nebraska_August%202015.

Endangered and Threatened Species Surveyors

Minnesota Department of Natural Resources, Division of Ecological and Water Resources

March 3, 2016

The Minnesota Department of Natural Resources' Division of Ecological and Water Resources (DNR) relies upon the results of endangered and threatened species surveys to conserve these species through its conservation, management, project review, and permitting responsibilities. In order to ensure that survey results are reliable, the DNR maintains a list of individuals who are considered qualified to conduct these surveys within the state of Minnesota. Please note that the DNR evaluates individuals, not firms.

The individuals on the DNR List of Surveyors have met criteria (described below) to demonstrate that they have the skills necessary to perform high quality surveys for these species in Minnesota. High quality survey data ensures the DNR's ability to uphold the Minnesota Endangered Species Statute (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134), and to avoid any potential delays due to misidentified or overlooked endangered or threatened species.

Endangered or threatened species surveys may require a permit before the survey can be initiated. Choosing an individual from the List of Surveyors ensures that the individual is able to obtain a permit from the DNR.

The DNR List of Surveyors is also used by the Minnesota Department of Transportation (DOT) **as part of** their process to pre-qualify vendors for rare, endangered & threatened species identification. However, the DOT pre-qualification is a separate process and being on the DNR List of Surveyors does not constitute approval by the DOT. The DOT may have additional requirements. Pre-qualification expedites the DOT hiring process, as bidding is not required for pre-qualified vendors. Please contact DOT directly (Christopher Smith, DOT Natural Resource Program Coordinator, at 651-366-3605 or christopher.e.smith@state.mn.us) to learn more about becoming a pre-qualified vendor.

Failure to fulfill DNR contract requirements may be grounds for removal from the List. Performance ratings are also maintained by DOT and are available to the DNR. Poor DOT performance ratings may also be grounds for removal from the List.

The DNR List of Surveyors is not intended as an endorsement of any one individual over another. There may be other individuals who are qualified to do rare species surveys. Individuals who would like to be placed on the List should contact Lisa Joyal, DNR Endangered Species Environmental Review Coordinator, at 651-259-5109.

In order to be placed on the DNR List of Surveyors, an individual must meet the following criteria:

1) Receipt of a four-year university or college degree in a natural science
2) Demonstrated ability to complete rare species surveys and resulting technical reports
3) Previous experience with Minnesota's endangered and threatened species

To document that s/he meets these criteria, we ask that the individual submit the following supporting documents to Lisa Joyal, DNR Division of Ecological and Water Resources, 500 Lafayette Road, Box 25, St. Paul, MN 55155 or lisa.joyal@state.mn.us :

1) A resume
2) Two letters of recommendation from agency or academic staff pertaining directly to the taxa (see below) for which the individual wishes to be considered
3) A technical report that contains an example of the individual's previous survey work
4) A list of the taxa (see below) for which the individual wishes to be considered

Taxa: mammals, birds, reptiles & amphibians, fish, topeka shiner, mussels*, insects, Dakota skipper, plants, dwarf trout lily, western prairie fringed orchid, prairie bush clover, *Botrychium* spp.

*To be included on the Mussel Surveyors List, interested individuals will also need to pass a mussel identification exam. After you submit the above materials we will notify you of the next exam date.

DNR List of Surveyors
Endangered and Threatened Plants

MNDNR

See endnote*

Surveyor	Phone Number	Email Address	Plants - General	*Botrychium spp.*	Dwarf Trout Lily	Prairie Bush Clover	Western Prairie Fringed Orchid	Bryophytes
Barb Delaney 1038 200th Street Dresser, WI 54009								
Barb Delaney	#715-294-3635	bdelaney1@centurytel.net	☑	☐	☐	☐	☑	☐
Barr Engineering Company 4700 West 77th Street, Suite 200 Minneapolis, MN 55435-4803								
Daniel DeJoode	#952-832-2919	ddejoode@barr.com	☑	☐	☐	☐	☐	☐
Daniel Jones	#952-832-2875	djones@barr.com	☑	☑	☐	☐	☐	☐
Daniel Tix	#952-540-7848	dtix@barr.com	☑	☑	☐	☑	☑	☐
8300 Norman Center Drive Minneapolis, MN 55437								
Fred Rozumalski	#612-832-2600	.	☑	☐	☐	☐	☐	☐
Chris Cole 911 West 4th Street Morris, MN 56267								
Chris Cole	#320-589-6319	.	☑	☐	☐	☐	☐	☐
Critical Connections Ecological Services, Inc. 21150 Ozark Avenue North, PO Box 184 Scandia, MN 55073								
Jason Husveth	#651-433-4410	jhusveth@ccesinc.com	☑	☑	☑	☐	☑	☐
Deb Pomroy 8143 Pequaywan Lake Road Duluth, MN 55803								
Deb Pomroy	#218-525-7502	.	☑	☐	☐	☐	☐	☐
Deborah Shubat 2155 Johnson Road Duluth, MN 55804								
Deborah Shubat	#218-525-3063	.	☑	☐	☐	☐	☐	☐
Ecological Strategies, Inc. PO Box 3 Maiden Rock, WI 54750								
Cynthia Lane	#715-448-4331	clane@cannon.net	☑	☐	☐	☐	☐	☐
ecosystems, llc PO Box 481 Rice Lake, WI 54868								
Tim King	#715-205-4624	tim@ecosystemscorp.com	☑	☐	☐	☐	☐	☐
Emmons & Olivier Resources, Inc. 651 Hale Avenue North Oakdale, MN 55128								
Beth Nixon	#651-770-8448	bnixon@eorinc.com	☑	☑	☑	☐	☐	☐

DNR List of Surveyors
Endangered and Threatened Plants

MNDNR

See endnote*

Surveyor	Phone Number	Email Address	Plants - General	*Botrychium spp.*	Dwarf Trout Lily	Prairie Bush Clover	Western Prairie Fringed Orchid	Bryophytes
Environmental Resources Management, Inc. 1701 Golf Road, Suite 1-1000 Rolling Meadows, IL 60008								
Nick Owens	#847-258-8926	nick.owens@erm.com	☑	☐	☐	☐	☐	☐
Gary Walton 4408 Miller Road Barnum, MN 55707								
Gary Walton	#218-389-3261	togbw@earthlink.net	☑	☐	☐	☐	☐	☐
George-Ann Maxson 4235 Carver Road NE Bemidji, MN 56601								
George-Ann Maxson	#218-586-3414	gamaxson@paulbunyan.net	☑	☐	☐	☐	☑	☐
Gustavus Adolphus College 800 W College Avenue St. Peter, MN 56082								
Cindy Johnson-Groh	#507-933-7043	.	☐	☑	☐	☐	☐	☐
HDR Engineering, Inc. 701 Xenia Avenue South, Suite 600 Minneapolis, MN 55416								
Scott Krych	#763-591-5420	scott.krych@hdrinc.com	☑	☑	☐	☐	☐	☐
Tony Randazzo	#763-591-5400	anthony.randazzo@hdrinc.com	☑	☐	☐	☐	☐	☐
John Moriarty 3261 Victoria Street Shoreview, MN 55126								
John Moriarty	#651-482-8109	frogs@umn.edu	☑	☐	☐	☐	☐	☐
Malcolm MacFarlane 888 East Third Street St. Paul, MN 55106								
Malcolm MacFarlane	#651-771-5609	MalcolmMacFarlan@aol.com	☑	☑	☑	☐	☑	☐
Marcia Richards 1118 Lori Lane Mankato, MN 56001								
Marcia Richards	#507-388-1401	.	☐	☐	☐	☑	☑	☐
Midwest Natural Resources (main contact: Scott Milburn) 744 James Avenue St. Paul, MN 55102								
Kevin Clay	#651-788-1074	kevin.clay@mnrinc.us	☑	☐	☐	☐	☑	☐
Otto Gockman	#651-788-0641	otto.gockman@mnrinc.us	☑	☑	☑	☑	☑	☑
Rhett Johnson	#320-815-8782	rhett.johnson@mnrinc.us	☑	☐	☐	☐	☑	☐
Dylan Lueth	#218-343-1290	dylan.lueth@mnrinc.us	☑	☑	☐	☐	☐	☐
Scott Milburn	#612-310-6260	scott.milburn@mnrinc.us	☑	☑	☑	☑	☑	☐
Andres Morantes	#612-483-8450	andres.morantes@mnrinc.us	☑	☐	☐	☐	☐	☑

Thursday, February 11, 2016

DNR List of Surveyors
Endangered and Threatened Plants

MNDNR

Surveyor	Phone Number	Email Address	Plants - General	*Botrychium spp.*	Dwarf Trout Lily	Prairie Bush Clover	Western Prairie Fringed Orchid	Bryophytes
			See endnote*					
MN Department of Transportation 395 John Ireland Blvd St. Paul, MN 55155 Ken Graeve	#651-366-3613	kenneth.graeve@state.mn.us	☑	☐	☐	☐	☐	☐
Moorhead State University, Department of Biology Building KH, Room 206 Moorhead, MN 56560 Richard Pemble	#218-477-5003	pemblerh@mnstate.edu	☑	☐	☐	☐	☑	☐
Short Elliott Hendrickson, Inc. 418 West Superior Street, Suite 200 Duluth, MN 55802-1512 Allyz Kramer	#218-279-3011	akramer@sehinc.com	☑	☑	☐	☐	☐	☐
St. Olaf College, Department of Biology 306 St. Olaf Avenue, Apt. 0 Northfield, MN 55057 Charles Umbanhower	#.	.	☑	☐	☐	☐	☐	☐
Stantec Consulting Services Inc. 2335 West Highway 36 St. Paul, MN 55113 Paul Bockenstedt	#651-604-4812	paul.bockenstedt@stantec.com	☑	☑	☑	☑	☑	☐
The Kestrel Design Group 7101 Ohms Lane Minneapolis, MN 55439-2142 Peter MacDonagh	#952-928-9600	pmacdonagh@tkdg.net	☑	☐	☐	☐	☐	☐
University of Minnesota Herbarium 220 Biological Science Center, 1445 Gortner Avenue St. Paul, MN 55108 Anita Cholewa	#651-625-0215	.	☑	☐	☐	☐	☐	☐
University of Minnesota, Crookston Owen Hall 204 Crookston, MN 56716 Daniel Svedarsky	#218-281-8129	dsvedars@mail.erk.umn.edu	☐	☐	☐	☐	☑	☐
Vande Water Natural Resource Services 429 Ogden Avenue Escanaba, MI 49829 Glenn Vande Water	#906-786-2141	.	☑	☐	☐	☐	☐	☐
Wenck Associates, Inc. 301 1st Street NE, Suite 202 Mandan, ND 58554 Sara Simmers	#701-751-6128	ssimmers@wenck.com	☑	☐	☐	☐	☐	☐
Wildlands Ecological Services 2009 Maryknoll Avenue North Maplewood, MN 55109-3645 Scott Zager	#651-261-2398	scott.zager@wildlands.biz	☑	☑	☑	☑	☑	☐

DNR List of Surveyors
Endangered and Threatened Plants

MNDNR

Surveyor	Phone Number	Email Address	See endnote* Plants - General	*Botrychium spp.*	Dwarf Trout Lily	Prairie Bush Clover	Western Prairie Fringed Orchid	Bryophytes
WSB & Associates, Inc. 701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 Andi Moffatt	#763-287-7196	amoffatt@wsbeng.com	☑	☐	☐	☐	☐	☐

*The identification of these species can be difficult; only the individuals with check marks in the corresponding boxes are considered qualified by the DNR. For Botrychium spp. and for Bryophytes, collection specimens are required; surveyor will need to obtain a collection permit from Rich Baker, at 651-259-5073 or Richard.Baker@state.mn.us, prior to any survey work.

The above is a list of individuals who are considered qualified by the Minnesota Department of Natural Resources (DNR) to conduct surveys for endangered and threatened plants within the state of Minnesota. Please note that the DNR qualifies individuals, not firms. The DNR maintains this list to ensure reliable survey results, which ensures the DNR's ability to uphold the Minnesota Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134), and avoids any potential delays due to misidentified or overlooked threatened or endangered species.

This list is not intended as an endorsement of any one individual over another. There may be other individuals who are qualified to do rare species surveys. Individuals who would like to be placed on the list should contact Lisa Joyal, DNR Endangered Species Review Coordinator, at 651-259-5109.