Appendix I

Eagle Management Plan

Big Bend Wind, LLC
Docket No. IP7013/WS-19-619
November 2020

Eagle Management Plan

Big Bend Wind Project

Cottonwood and Watonwan Counties, Minnesota

Prepared by:

Big Bend Wind, LLC

310 4th Street NE, Suite 300,
Charlottesville, Virginia 22902

October 12, 2020

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

APLIC	Avian Power Line Interaction Committee
Big Bend Wind, LLC	Big Bend Wind
BMP	Best Management Practice
ECPG	*Eagle Conservation Plan Guidance: Module 1 – Land-Based Wind Energy, Version 2*
EMU	eagle management unit
FR	Federal Register
ft	Foot/feet
km	kilometer
LAP	local area populations
m	meter
mi	mile
min	minute
MW	megawatt
Project	Big Bend Wind Project
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
WEG	*Land-Based Wind Energy Guidelines*
WEST	Western EcoSystems Technology, Inc.
WIRS	Wildlife Incident Reporting System
WTGs	Wind Turbine Generators

1.0 INTRODUCTION

Big Bend Wind, LLC (Big Bend Wind) is developing the Big Bend Wind Project (Project) in Cottonwood and Watonwan counties, Minnesota (Figure 1). Big Bend Wind, in conjunction with Western EcoSystems Technology, Inc. (WEST), has prepared this Eagle Management Plan.

Federal law does not require wind project developers to obtain eagle take permits or to prepare an eagle conservation plan to develop and/or operate a wind project. However, to proactively address potential eagle impacts from the construction and operation of the Project on eagles, Big Bend Wind developed this Eagle Management Plan. The Eagle Management Plan, which relies on guidance articulated in the Final Eagle Rule and the US Fish and Wildlife Service (USFWS) *Land-Based Wind Energy Guidelines* (WEG, USFWS 2012) and *Eagle Conservation Plan Guidance: Module 1 − Land-Based Wind Energy, Version 2* (ECPG; USFWS 2013), will be voluntarily implemented at the Project to evaluate risk to eagles.

This Eagle Management Plan summarizes the environment surrounding the Project, describes the avian and eagle studies conducted at the Project, evaluates potential impacts to both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), identifies the enacted Final Eagle Rule and federal permitting process, and identifies avoidance and risk minimization actions that will be implemented during Project construction and operation.

The Project is a utility scale wind energy facility that will include up to 55 wind turbine generators (WTGs), ranging from 5.5 megawatts (MW) to 5.7 MW in capacity, for a Project nameplate capacity of up to 308 MW (Figure 1). The minimum convex polygon (MCP) encompasses the hazardous area around all turbines and totals approximately 31,465 acres (12,733 hectares; Figure 1; USFWS 2013) (Figure 1). Avian and eagle studies were initiated in 2017 and will be completed in February 2021, following methodology consistent with the ECPG as well as USFWS consultation.

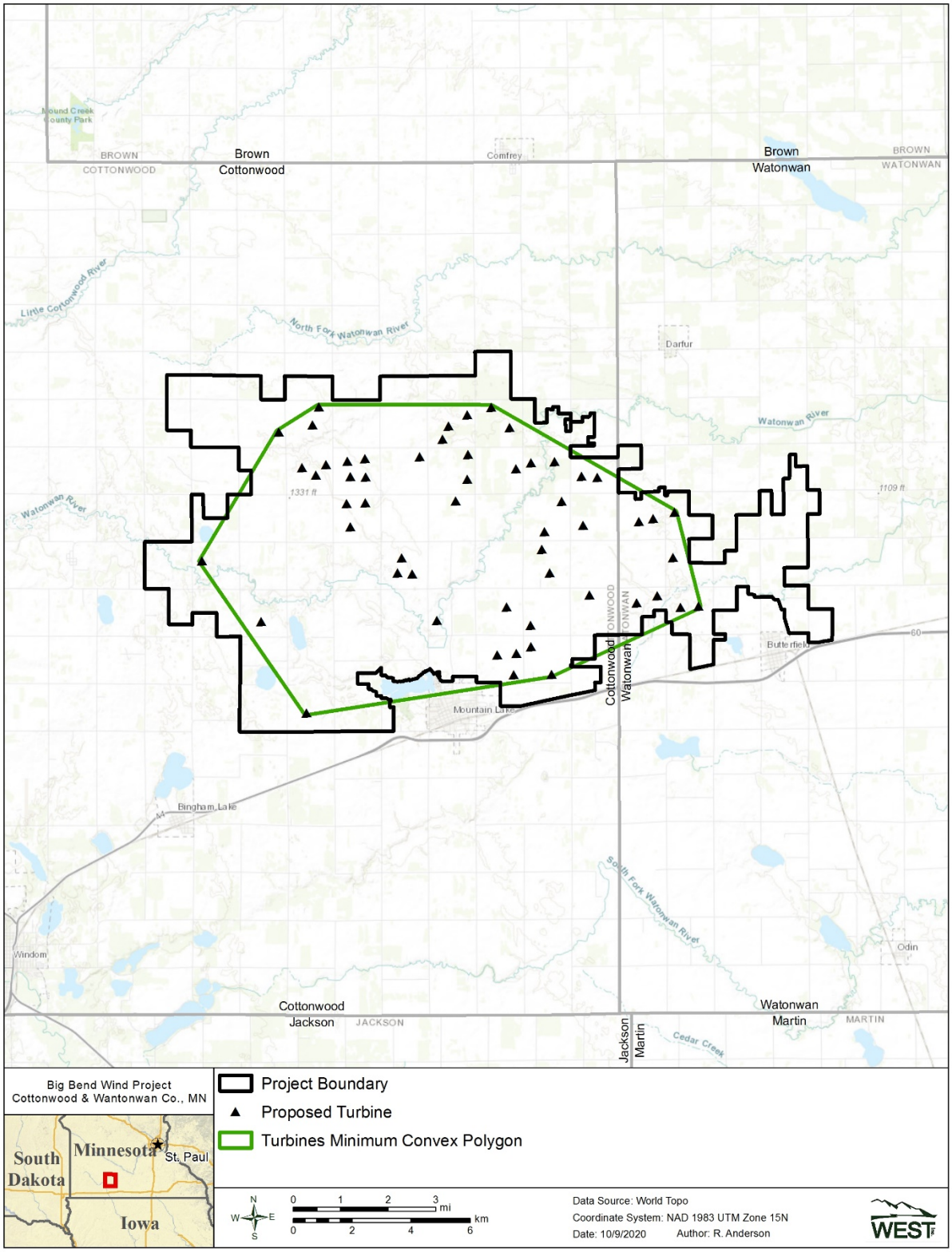

Figure 1. Location of the proposed Big Bend Wind Project in Cottonwood and Watonwan counties, Minnesota.

1.1 Environmental Setting

The Project is located within the Des Moines Lobe Level IV Ecoregion, within the Western Corn Belt Plains Level III Ecoregion (US Environmental Protection Agency [USEPA] 2017), which covers much of Iowa and portions of southern Minnesota and eastern Nebraska. This ecoregion is characterized by glaciated till plains and undulating loess plains. Tallgrass prairie, riparian forest, oak- (*Quercus* spp.) prairie savannas, and woody and herbaceous wetlands originally dominated the region. Today, most of the area has been cleared for farms producing corn (*Zea mays*), soybeans (*Glycine max*), and livestock (USEPA 2017). Land cover within the MCP is predominately cultivated crops (91.1%; Table 1, Figure 2). Land cover likely to attract eagles and other wildlife is sparse, including open water (1.3%), hay/pasture (1.3%), emergent wetlands (1.2%), herbaceous (0.6%), deciduous forest (0.3%), mixed forest (0.2%), woody wetlands (0.1%), and shrub/scrub (less than 0.1%; Table 1). Topography around the MCP is relatively flat, with elevations ranging from 317.1−454.8 meters (m; 1,040.4–1,492.1 feet [ft]; Figure 3).

Table 1. Land cover types present within the proposed Big Bend Wind Project in Cottonwood and Watonwan counties, Minnesota.

	Minimum Convex Polygon	
Cover Type	**Acres**	**Percent Composition**
Cultivated Crops	28,656	91.1
Developed	1,231	3.9
Open Water	403	1.3
Hay/Pasture	395	1.3
Emergent Wetlands	373	1.2
Herbaceous	199	0.6
Deciduous Forest	96	0.3
Mixed Forest	70	0.2
Barren Land	22	0.1
Woody Wetlands	19	0.1
Shrub/Scrub	2	<0.1
Total	**31,465**	**100**

Data source: National Land Cover Database 2016.

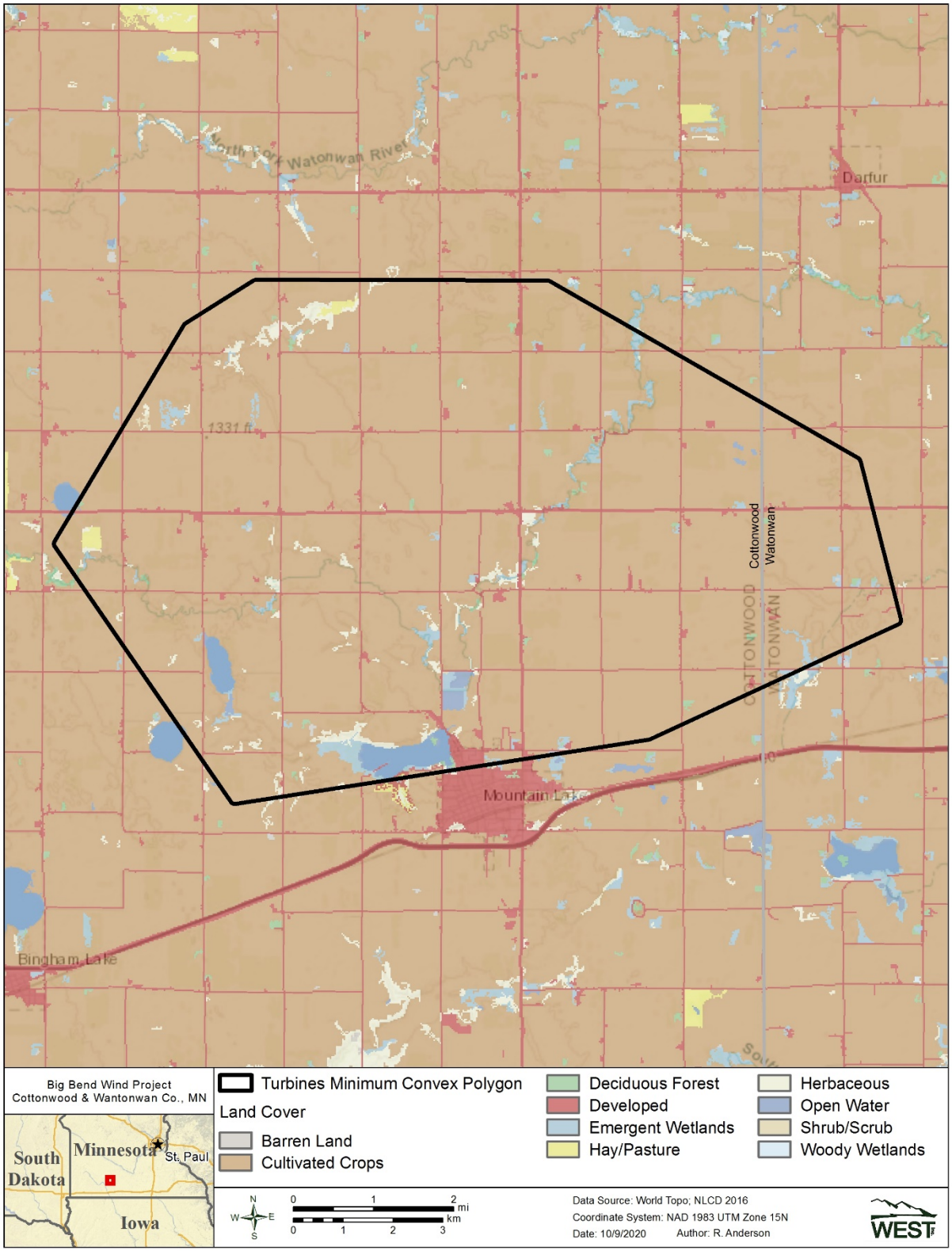

Figure 2. Land cover and land use within and near the MCP for the proposed Big Bend Wind Project in Cottonwood and Watonwan counties, Minnesota.

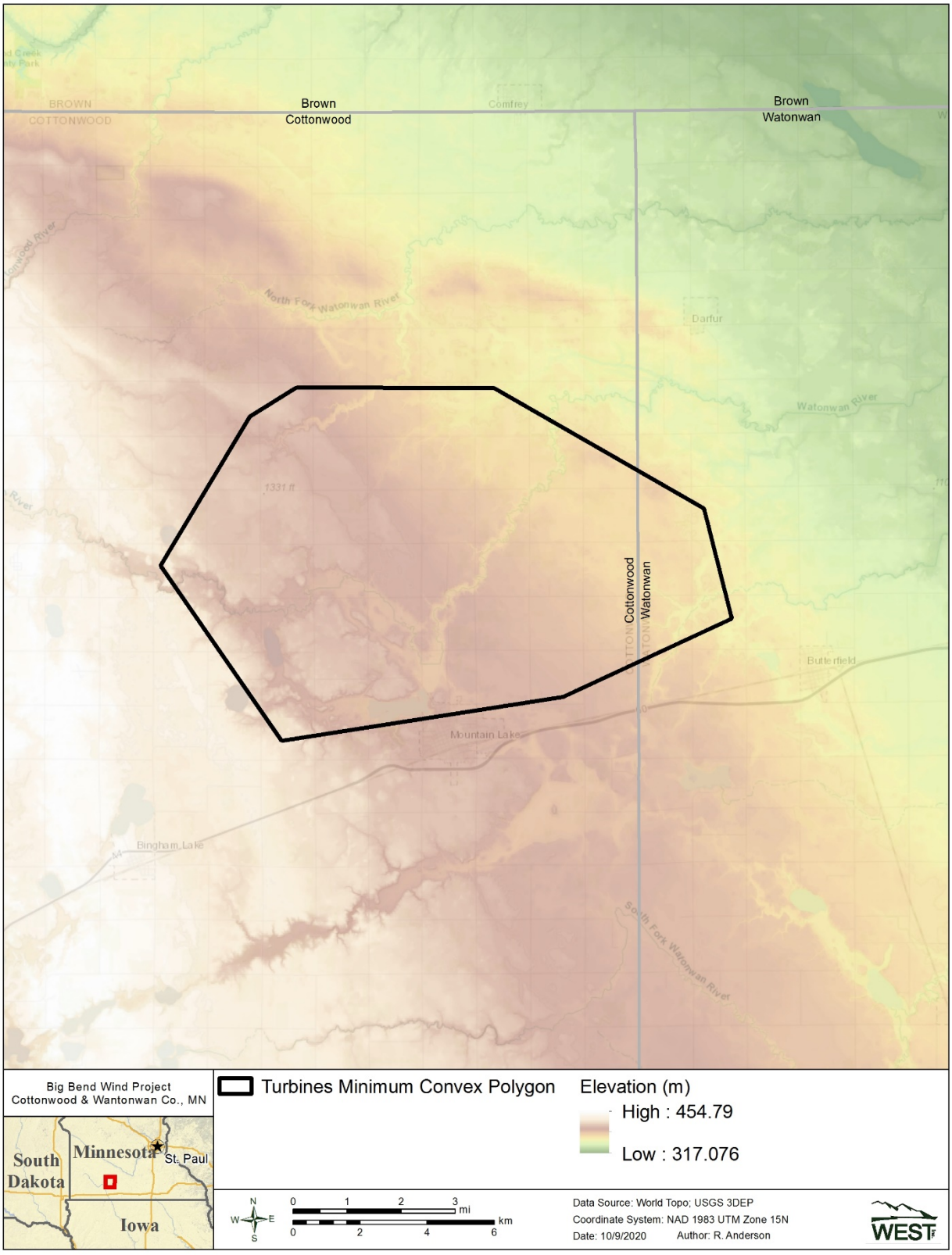

Figure 3 Topography within and near the MCP for the proposed Big Bend Wind Project, in Cottonwood and Watonwan counties, Minnesota.

1.2 Agency Coordination

Big Bend Wind has worked closely with state and federal agencies from 2017 to present to discuss potential environmental impacts related to the development and operations of the Project (Table 2). These agency consultations have included discussions about the potential for operational impacts to bald and golden eagles. As an outgrowth of this coordination, Big Bend Wind has voluntarily developed this Eagle Management Plan.

Table 2. Background and agency coordination milestones for the proposed Big Bend Wind Project in Cottonwood and Watonwan counties, Minnesota.

Date	Subject
November 2, 2017	Big Bend Wind requested data from USFWS regarding eagle nests known to occur within 10 miles (16 kilometers) of the Project.
December 19, 2017	Big Bend Wind met with the USFWS and MNDNR to discuss the wildlife study plan.
March 14, 2019	Big Bend Wind provided copies of Tier 3 wildlife studies to USFWS and MNDNR and requested to set up a meeting with both agencies.
April 19, 2019	Big Bend Wind and WEST met with MNDNR to evaluate the results of the completed wildlife studies.
April 24, 2019	Big Bend Wind and WEST communicated with USFWS via conference call to evaluate the results of the completed wildlife studies.
May 8, 2020	Big Bend Wind requests comment from MNDNR on the Project as part of the state permitting process.
July 7, 2020	MNDNR provides comments on the Big Bend Wind Project in advance of the Big Bend Wind submitting an application for a large wind energy conversion system permit.

2.0 PRELIMINARY SITE EVALUATION (STAGE 1)

A preliminary landscape-scale assessment was conducted as part of Tiers 1 and 2 of the WEG (USFWS 2012) and Stage 1 of the ECPG (USFWS 2013). The goal of the preliminary site evaluation was to characterize eagle use of the Project and the expected level of risk, following the classifications outlined in the ECPG.

2.1 Desktop Evaluation of Population Status and Site Activity

2.1.1 General Eagle Population Information

Since delisting from the threatened and endangered species list in 2007, the bald eagle population in the contiguous US has continued to increase. In the last estimate by the USFWS, the bald eagle population was approximated to be 143,000 eagles (USFWS 2016a). Based on a settlement with the Energy and Wildlife Action Coalition, the USFWS will publish an updated bald eagle population estimate by the end of 2020 (Energy and Wildlife Action Coalition v. U.S. Department of the Interior, No. 1:15-cv-01486-ABJ [D.D.C., filed October 16, 2019]).

In 2005, MNDNR (in association with USFWS and the US Geological Survey) conducted a statewide survey of bald eagle nests. A total of 1,312 active bald eagle nests were documented during surveys of historic nest locations and random plots within the four ecological provinces of Minnesota (MNDNR 2006). The Project, which is located in the Prairie Parkland Province, is an area dominated by agricultural activity and has minimal to less than suitable habitat for nesting eagles than the three other ecological provinces. During the 2005 survey, only 73 of the 1,312 active nests (5.6%) were located in the Prairie Parkland Province. WEST conducted additional raptor nest surveys in 2016-2019 for energy and infrastructure development projects and estimated 113 active eagle nests within the surveyed portion of the Prairie Parkland Province (Foo et al. 2020). While neither study conducted a systematic sample of the entire Prairie Parkland Province, results suggest the bald eagle population is increasing steadily within the province even though it contains less suitable habitat due to the high percentage of active annual agriculture activities.

There is no local population of golden eagles near the Project. Golden eagles may occur in the region during migration seasons or occasionally in winter; they do not breed in the area (Cornell 2019).

2.1.2 Examination of eBird Reports

Reports for bald eagle observations within the last 10 years in Cottonwood and Watonwan counties, Minnesota, suggested seasonal patterns of bald eagle use (eBird 2020). Bald eagle observations were reported throughout the year; however, observations appear to peak in winter and spring (eBird 2020). Only one golden eagle observation has been reported in Cottonwood County; it occurred on April 2, 2018 (eBird 2020).

2.1.3 Examination of Hawkwatch Data

Counts of raptors have been recorded during spring and fall migration (March − May and August − December, respectively) since 2009 at Bethany Hawkwatch (located at Bethany Lutheran College), approximately 55 miles (mi) to the east, in Mankato, Minnesota. These records provide seasonal indices of raptors migrating through the Minnesota River Valley. Bald eagles were reported throughout the migration seasons, but observations tended to peak in March and November. Most of the bald eagles migrating through this area are expected to continue north or south to breeding and wintering habitats, respectively; however, there is potential for some bald eagles to breed in and around the Project (MNDNR 2006).

Golden eagles have also been recorded at the Bethany Hawkwatch, but in far lower numbers (Hawk Migration Association of North America 2020). Golden eagles migrating through this area are likely to continue flying north or south since they do not breed in the area and are rare in winter (Cornell 2019).

2.1.4 Examination of Christmas Bird Count (CBC) Data

The National Audubon Society's annual CBC is a citizen science project that provides winter census data for avian species. The Mountain Lake-Windom CBC Circle was established in 1970 and is centered 1.5 mi west of the Project and includes the southwestern portion of the Project. These counts can provide estimates of the wintering populations of different species in an area. Since 2010, an average of 3.14 bald eagle observations each year (0.1457 bald eagle observations per party hour) were reported at the Mountain Lake-Windom CBC Circle (National Audubon Society [Audubon] 2020). No golden eagles have been observed during CBC at this location.

2.2 Assessment of Eagle Risk based on Stage 1 Assessment

Information on seasonal and spatial patterns of bald eagle abundance near the Project is limited. Based on relatively low abundance in eBird reports, spring and fall migration data from a Hawkwatch site located 55 mi away, and relatively low abundance in winter based on CBC data, the Project appears to be low to moderate expected risk as described in the ECPG. For golden eagles, the Project appears to be a low risk site as defined in the ECPG. However, the preliminary site evaluation is inconclusive and more detailed site-specific (Stage 2) information is needed to determine eagle risk at this site.

3.0 SITE-SPECIFIC SURVEYS (STAGE 2)

Baseline wildlife studies were designed to collect information about wildlife species and behavior within and near the Project to aid assessment of potential risks to species or habitats of concern, including bald and golden eagles in alignment with Stage 2 of the ECPG. Studies at the Project collected information about eagle use rates and breeding territories in and around the proposed Project area. Eagle use data has been collected at the Project since 2017 and raptor nest surveys were conducted for the Project in 2018, 2019, and 2020.

3.1 Eagle Use Surveys

As recommended in the ECPG, eagle use surveys were designed to collect information that can be used to estimate eagle exposure rates (i.e., eagle-minutes flying within the Project per hour per square km). The number of eagle use survey points varied over the years and fluctuated with changes in the Project boundaries; however, all points were established to achieve over 30% coverage of the various Project boundaries. These surveys followed methods described in Reynolds et al. (1980) and recommendations in the WEG (USFWS 2012), ECPG (USFWS 2013), and final eagle rule[1] (USFWS 2016b). Survey points were centered within 800-m (2,625-ft) radius circular plots that included a 200-m (656-ft) ceiling (risk cylinder); bald eagle minutes were recorded for bald eagle observations as minutes flying within the risk cylinder during a 60 minute (min) survey period. Surveys were completed once per month at each survey point.

3.1.1 Year 1 Avian Use Surveys (November 2017 − October 2018)

WEST completed surveys at 42 survey points established throughout the Project from November 2017 – October 2018 (Figure 4; Foo et al. 2019). In March 2018, the Project boundary expanded and fifteen points were added. These points were not surveyed during the winter season (November 2017 – February 2018); however, eagle use at those points is expected to be comparable to the points surveyed during the winter (Foo et al. 2019). The 2019 Project boundary change occurred prior to finalizing the Year 1 Avian Use Survey Report; the analysis of Year 1 data was updated to only present results within the 2019 Project boundary (Foo et al. 2019). The points surveyed in Year 1 provided coverage of 31.6% of the MCP.

During 433 survey hours, 32 eagles were recorded of which 13 were observed flying. Of the flying eagles observed, 69.2% were flying within the estimated rotor swept height (RSH; 25−200 m [82−656 ft]). Seasonal bald eagle use was highest during the fall (0.17 observation/survey), followed by spring (0.07), and winter and summer (0.02).

Bald risk eagle minutes were documented at 16 of the 42 survey points (Figure 5). Point 19 had the highest eagle risk minutes per survey hour (2.00), followed by Point 77 (1.25) and Point 38 (1.17; Figure 5). Bald eagle observations were documented throughout the Project and not concentrated within a single area; however, the majority of observations were recorded in close proximity to rivers and lakes. No golden eagles were observed during surveys or incidentally.

Bald eagle prey, such as waterfowl, were also recorded during the avian use surveys to identify any potential concentration areas within the Project. Canada goose (*Branta canadensis*) composed 61.6% of observations during the avian use surveys (Foo et al. 2019). Snow goose (*Anser caerulescens*, 9.7%) and mallard (*Anas platyrhynchos*, 7.3%) were the next most commonly observed waterfowl species. Based on the results of the avian use surveys, waterfowl may use stopover habitat within the Project during migration seasons, but waterfowl are not abundant throughout the year (Foo et al. 2019).

[1] The final eagle permit rule codified at 50 CFR § 22.26 as revised on December 16, 2016.

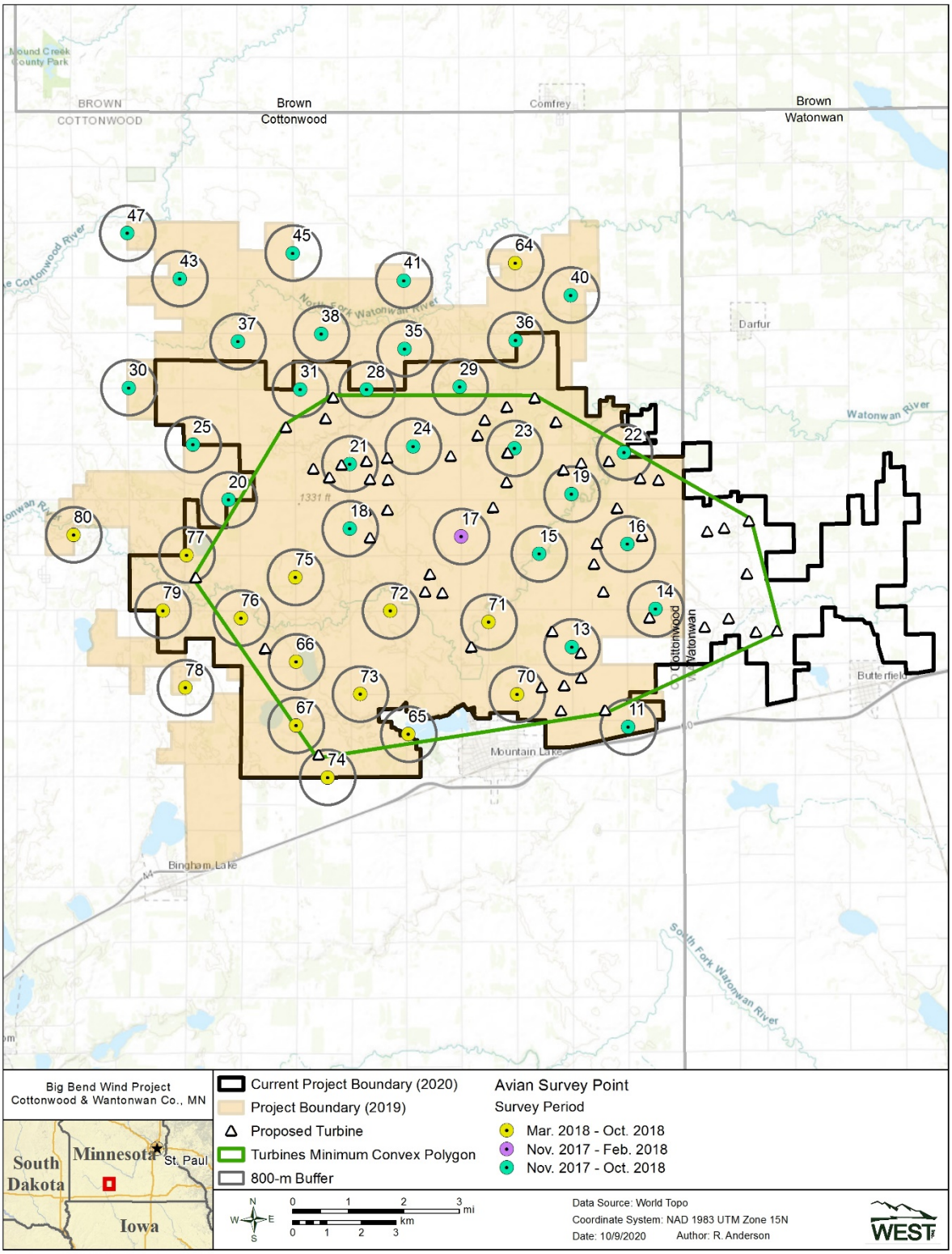

Figure 4. Year 1 avian use survey points within the proposed Big Bend Wind.

Notes: Point 17 was removed in February 2018 due to land access issues.

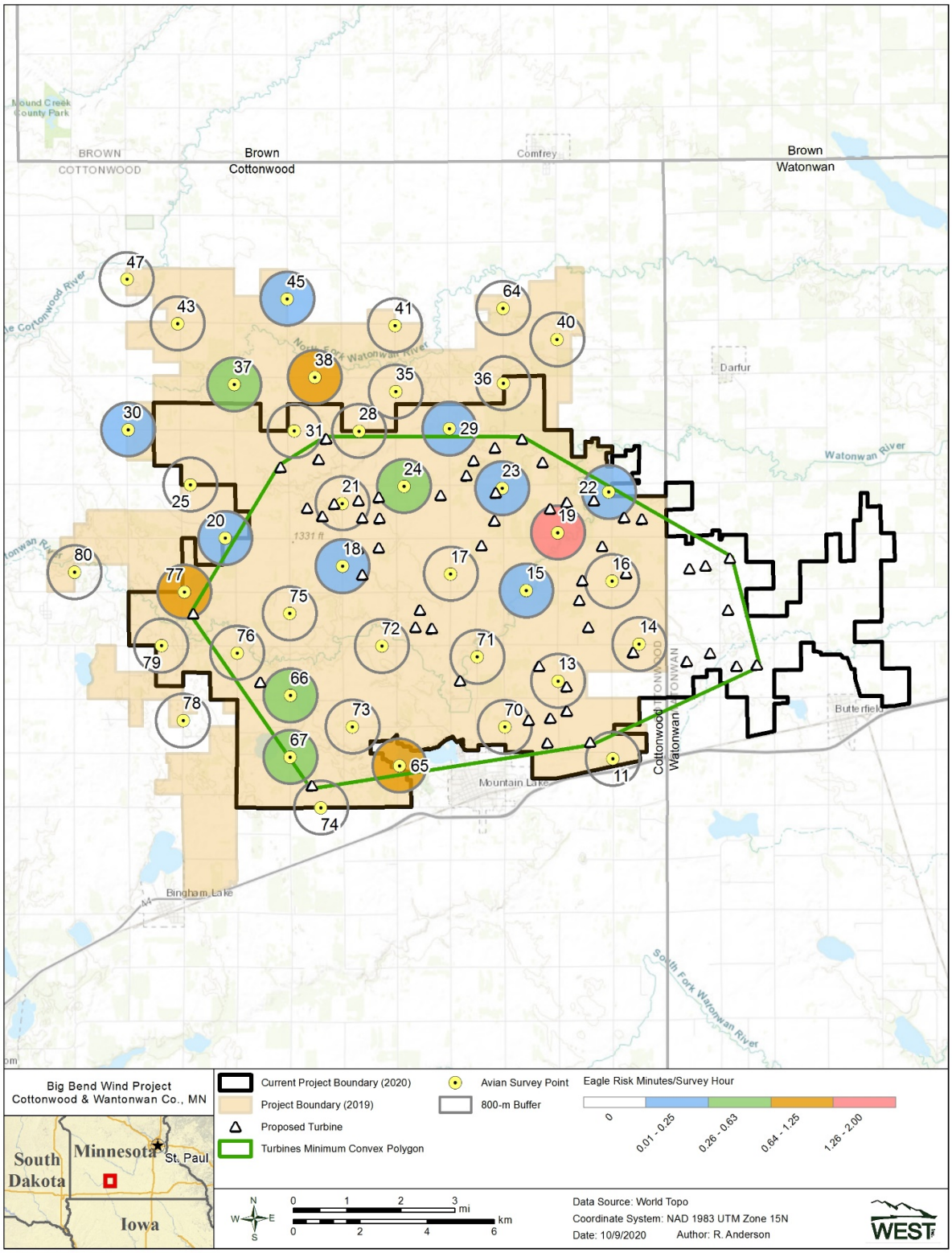

Figure 5. Eagle risk minutes per survey hour by observation point during Year 1 avian use surveys at the proposed Big Bend Wind Project.

Notes: Point 17 was removed in February 2018 due to land access issues.

3.1.2 Year 2 Avian Use Surveys (November 2018 − February 2020)

Following the same methods as in year 1, a second year of avian use surveys was conducted at the Project from November 2018 – February 2020 (Bailey et al. 2020). Surveys were completed from November 2018 – October 2019 at 26 survey points, from November 2018 – February 2020 at 15 points added to the study partway through Year 1, and from July 2019 – February 2020 at one survey point added to the study after a small portion of the boundary was expanded based on feedback from MNDNR and USFWS (Figure 6). The points surveyed in Year 2 provide coverage of 30.0% of the MCP.

During 554 survey hours, 28 bald eagles were recorded of which 27 were observed flying within the estimated RSH. Seasonal bald eagle use was highest during the winter (0.27 observation/survey), followed by fall (0.13), and spring (0.11) and no use was recorded during the summer (0.00). No golden eagles were observed during surveys or incidentally.

Bald eagle risk minutes were recorded at 17 of 42 points (Figure 7). The points with the highest eagle risk minutes per survey hour changed in the second year of surveys. Bald eagle risk minutes per survey hour were highest at points 15 (1.17 risk minutes/survey), 40 (1.00) and 74 (0.53; Figure 7). No eagle minutes were recorded at Point 19, where use was highest in Year 1; however, Point 15 is adjacent to Point 19 along the Watonwan River. Eagle use was not concentrated in a particular portion of the Project; however, higher use was typically associated in close proximity to rivers and lakes that may provide foraging habitat for eagles (e.g., Point 15). Canada goose was the most abundant waterfowl species observed in Year 2, similar to Year 1, but only made up 17.4% of large bird use (Bailey et al. 2020).

3.1.3 Year 3 Avian Use Surveys (March 2020 – February 2021)

In March 2020, the Project boundary expanded into Watonwan County. Eight additional eagle use survey points were added to the study in the previously unsurveyed area (Figure 8). Avian use points surveyed from November 2017 through February 2021 provide a total coverage of 33.4% of the MCP. Survey methods are consistent with Year 1 and Year 2 surveys. This section will be updated after one year of data has been collected at the eight points added in 2020.

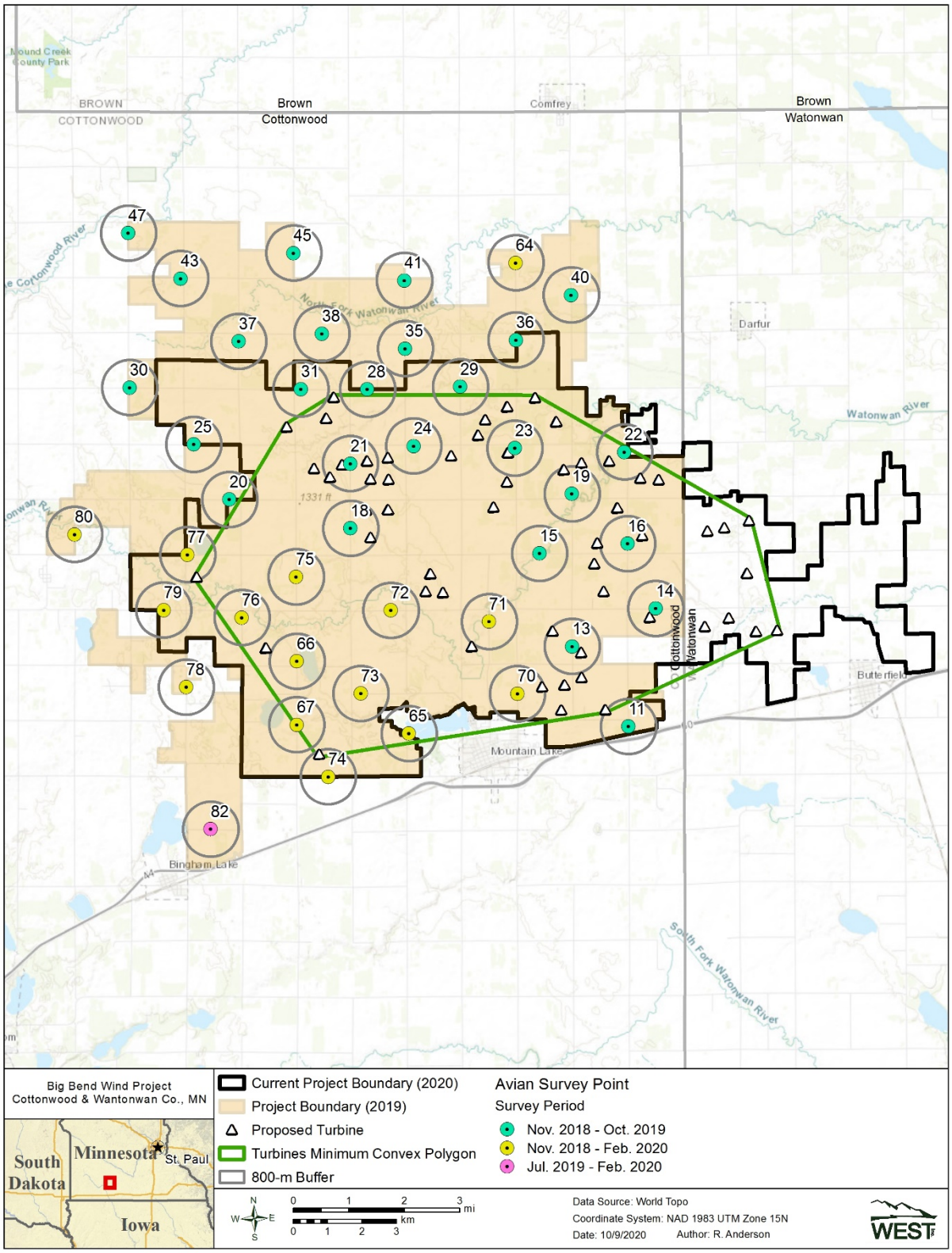

Figure 6. Year 2 avian use survey points within the proposed Big Bend Wind Project.

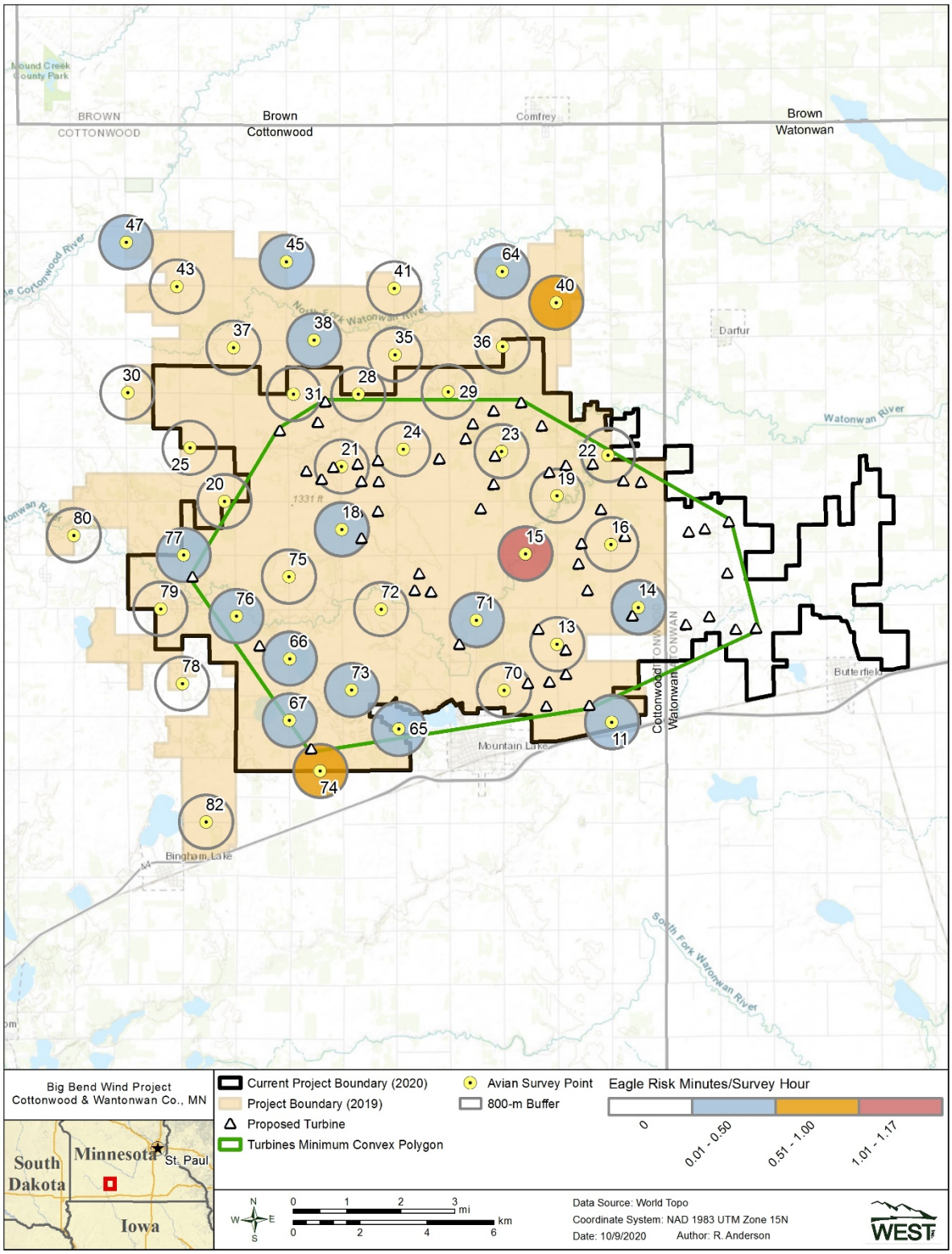

Figure 7. Eagle risk minutes per survey hour by observation point during Year 2 avian use surveys at the proposed Big Bend Wind Project.

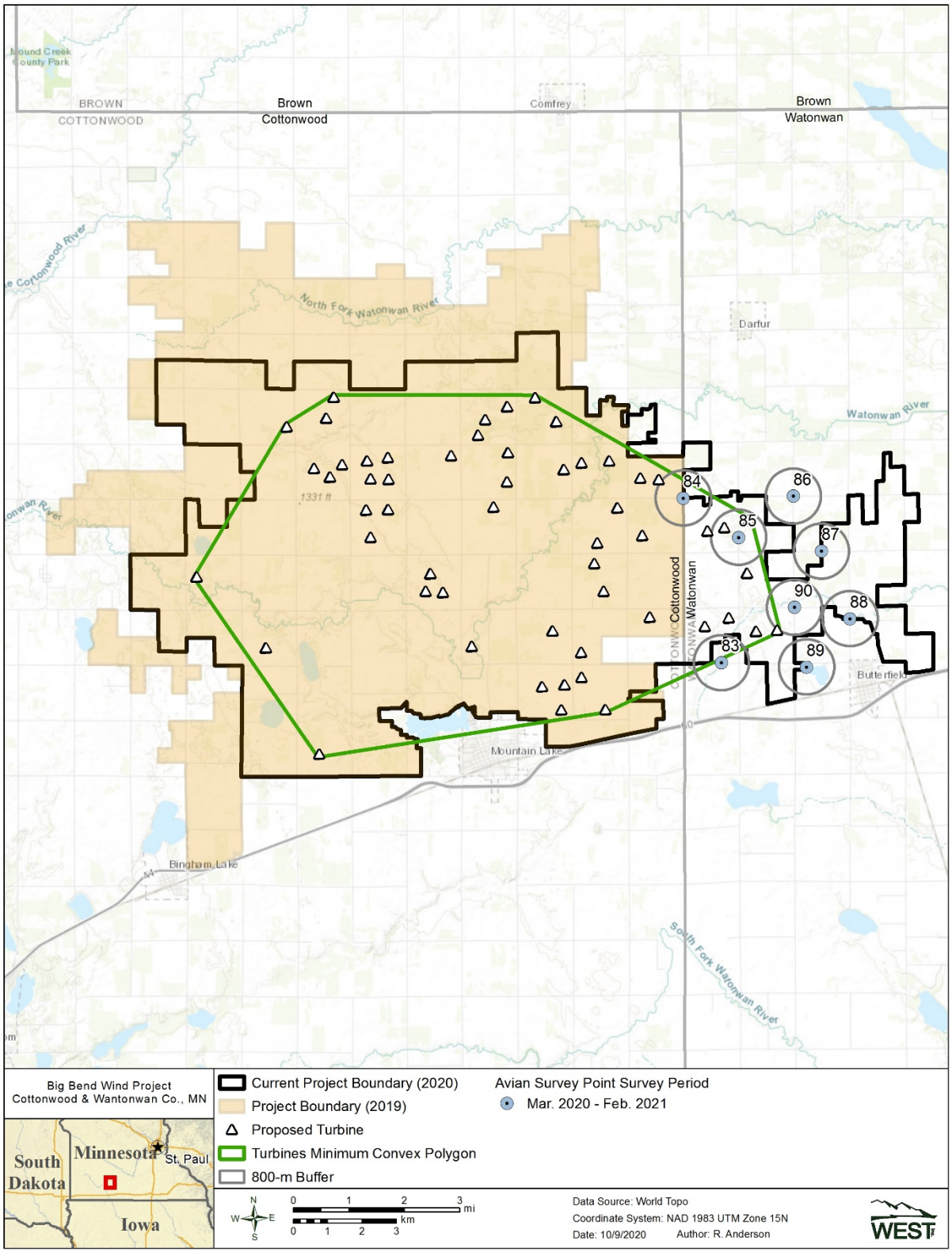

Figure 8. Year 3 avian use survey points within the proposed Big Bend Wind.

3.2 Eagle Nest Surveys

Eagle nest surveys were conducted following recommendations in the ECPG (USFWS 2013). As stated in the ECPG, the primary objective of these surveys was to determine the number, location, and status of eagle nests and the approximate centers of occupied eagle nesting territories within or near the Project. Survey methods varied slightly each year (described below).

Nest status was categorized using definitions originally proposed by Postupalsky (1974) and largely followed today (USFWS 2013). Nests were classified as occupied if any of the following were observed at the nest structure: (1) an adult in an incubating position, (2) eggs, (3) nestlings or fledglings, (4) presence of an adult (sometimes sub-adults), (5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor had been observed earlier in the breeding season, or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. Occupied nests were further classified as active if (1) an adult was present on the nest in an incubating position, (2) an egg or eggs were present, or (3) nestlings were observed. Occupied nests were classified as inactive if adults were not observed in a brooding position and no eggs or chicks were present. Nests not meeting the above criteria for occupied were classified as inactive large stick nests.

3.2.1 2018 Raptor Nest Survey

The 2018 Raptor Nest Survey was conducted on March 27 and April 12, 2018 (LeBeau and Foo 2018a). The Project area and a 10 mi buffer of the 2018 Project boundary was surveyed for eagle nests. One biologist flew 0.5 mi transects of the survey area in an R-44 helicopter. No nests were located within the current Project boundary; Nest 3251 was located 2.2 mi from the closest proposed turbine (Figure 9). Sixteen occupied bald eagle nests were discovered within 10 mi of the 2018 Project boundary (Table 3). Three additional large stick nests consistent in size and structure with eagle nests were also recorded: one occupied great horned owl (*Bubo virginianus*) and two inactive unidentified raptor nests.

3.2.2 2019 Eagle Nest Survey

The 2019 Eagle Nest Survey was conducted on March 26 and 28, 2019 (Foo and LeBeau 2019). The purpose of this survey was to locate bald eagle nests within 2.0 mi of the Project, and to visit previously documented nests within the half mean inter-nest distance (5.6 mi) that was calculated based on the results of the aerial raptor nest surveys conducted at the Project in 2018 (LeBeau and Foo 2018a). Two biologists flew 1.0 mi transects of the survey area in a R-44 helicopter. No nests were located within the current Project boundary; Nest 3251 remained the closest nest to a proposed turbine (2.2 mi; Figure 9, Table 3). Four occupied bald eagle nests were discovered within the 5.6 mi buffer (Table 3). Three of these nests had been located in 2018 and one was discovered in 2019 (Nest 13396).

3.2.3 2020 Raptor Nest Survey

The 2020 Raptor Nest Survey was conducted February 19 − 21, 2020 (Janos 2020). The Project area and a 10-mi buffer of the current Project boundary was surveyed for eagle nests. Two biologists flew 1.0 mi transects of the survey area in a Cessna 172 fixed-wing aircraft. Fourteen

nests consistent in size and structure with eagle nests were recorded during surveys (Janos 2020). Of the fourteen nests, eleven were occupied bald eagle nests (five occupied active and six occupied inactive). One occupied nest was inside the Project boundary (BAEA5), one was 1.1 mi from the Project boundary, and nine were more than 2.0 mi from the Project boundary (Figure 9, Table 3). Three inactive large stick nests consistent in size and structure with eagle nests were recorded; one of these nests had been occupied by a bald eagle in 2019 (Nest 13396).

Table 3. Results of aerial nest surveys identified in proximity to the proposed Big Bend Wind Project in Cottonwood, Jackson, Martin, Watonwan, Brown and Redwood counties, Minnesota in 2018, 2019, and 2020.

Nest ID	Status[1] 2018[2]	2019[3]	2020[4]	Notes
BAEA5			OA	
3251	OA	OA	OI	Nest ID BAEA6 in 2020
3258	OA	OA	OA	Nest ID BAEA1 in 2020
BAEA3			OI	
BAEA12			OI	
13396		OA	I	Nest ID BAEA13 in 2020
BAEA2			OI	
2039	OA	OA	OA	Nest ID BAEA10 in 2020
BAEA11			OA	
3245	OA		OA	Nest ID BAEA4 in 2020
3235	OA			
BAEA14			OI	
BAEA7			OI	
3254	OA			
3234	OA			
812	OA			
3257	OI			
2023	OA			
3252	OA			
3256	OA			
852	OA			
2040	OA			
2028	OA			
813	OA			
Large Stick Nests Consistent in Size and Structure with Bald Eagle Nests				
BAEA9			I	
BAEA8			I	
2041	OA			Great-horned owl nest in 2018
3243	I			Unidentified raptor nest in 2018
3244	I			Unidentified raptor nest in 2018

[1]OA = occupied active, OI = occupied inactive, I = inactive, [2]LeBeau and Foo 2018a, [3]Foo and LeBeau 2019, [4]Janos 2020

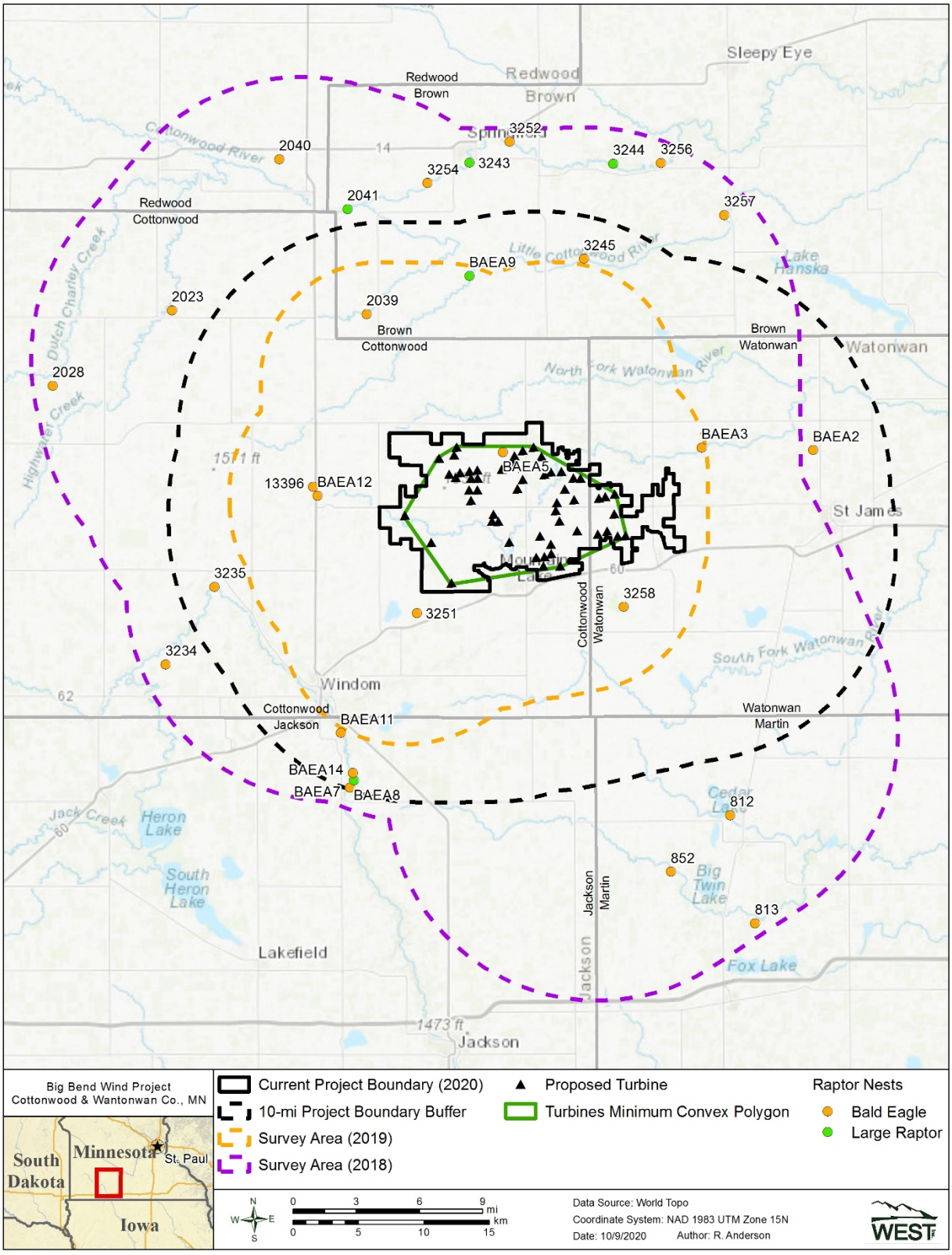

Figure 9. Bald Eagle and large raptor nests identified in proximity to the proposed Big Bend Wind Project during three years of eagle nest surveys in Cottonwood, Jackson, Martin, and Watonwan, Brown, and Redwood counties, Minnesota.

3.3 Eagle Nest Monitoring

Eagle nest monitoring was conducted each year based on the results of the eagle nest surveys. The objective of eagle nest monitoring was to characterize the distribution and intensity of use by nesting eagles around the nest location and surrounding area within and near the Project.

3.3.1 2018 Eagle Nest Monitoring

Nest 3258 was monitored for 88 hours between May 5 and July 11, 2018, with four-hour surveys conducted twice weekly. One eaglet was confirmed to have fledged from the nest. Flight paths were recorded, and the majority of the eagle activity was documented within 0.3 mi to the nest and around Sulem Lake (LeBeau and Foo 2018b). Both the nest and Sulem Lake were located within the 2018 Project boundary, but are located outside of the current Project boundary. Nest 3258 is located 3.4 mi from the closest proposed turbine (Figure 9).

3.3.2 2019 Eagle Nest Monitoring

Nest 3251 was monitored for 24 hours between May 23 and June 10, 2019, with four-hour surveys conducted twice weekly. No eagles were observed at the nest after May 31 and the nest was assumed to have failed after three, four-hour surveys with no eagle observations. The majority of the documented flight paths were north and west of the nest. Nest 3251 was located within the 2019 Project boundary, but is located outside the current Project boundary. Nest 3251 is located 2.2 mi from the closest proposed turbine (Figure 9).

3.3.3 2020 Eagle Nest Monitoring

Nest BAEA5 was monitored for 76 hours between March 26 and August 1, 2020, with one-hour surveys conducted at four points weekly (Foo and Bailey 2020). Bald eagle observations, behaviors, and flightpaths were recorded regardless of the distance from the observer. Nest BAEA5 is located 0.6-mi from the closest proposed turbine and within the current boundary (Figure 9). Of note, there are no turbines located to the southwest, northwest, north, or northeast of the nest or an approximate 260 degree arch.

Of the 39 eagles observed flying during surveys, 94.7% were flying within the estimated rotor-swept height (RSH; 25 to 200[2] m above ground level). The remaining flights (5.3%) were below the estimated RSH; no eagles were observed flying above the estimated RSH. Relative to concentrations of flight paths observed within 1.0 mi of the nest, very high concentrations of eagle flights were observed within 100 m of the nest, with other areas of medium- and high-concentrations of flights along the tributary of the North Fork Watonwan River approximately 0.4-0.5 mi northwest of the nest (Figure 9). Flight paths were mapped near turbines to the southeast; however, in comparatively low numbers. One eaglet fledged from the nest in late June; therefore, the nest was successful in 2020.

[2] The ECPG uses 200 m as the upper bound of turbine tip height.

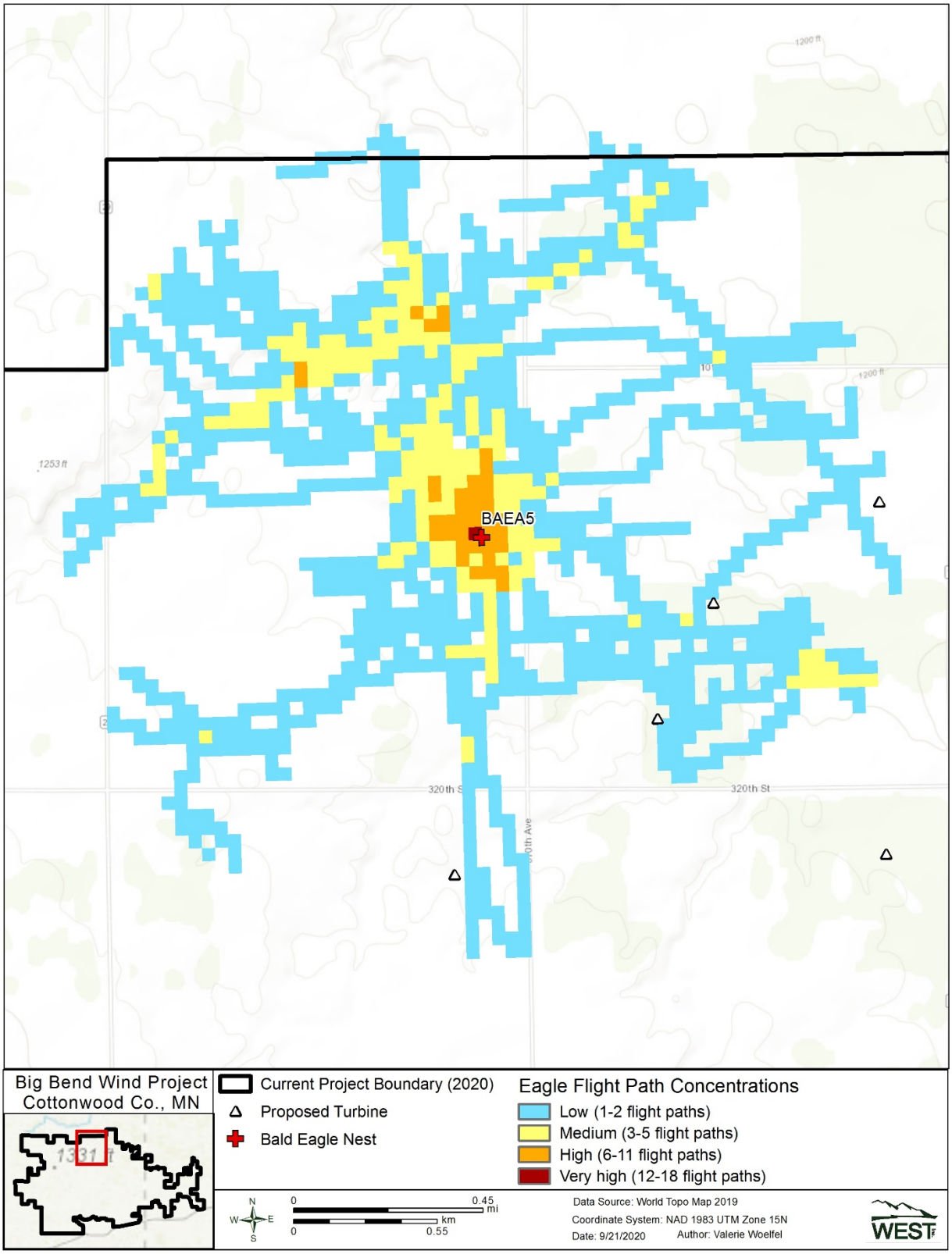

Figure 10. Flight path data collected from Nest BAEA5 from March 26 – August 1, 2020 at the proposed Big Bend Wind Project in Cottonwood County, Minnesota.

3.4 Assessment of Eagle Risk Based on Stage 2 Assessment

The preliminary site assessment indicated the Project would likely pose a low-moderate risk for bald eagles due to the altered landscape, scarcity in recorded observations, and minimal prey-based habitats. However, based on site-specific surveys, the Project appears to be moderate expected risk for bald eagles as described in the ECPG. The Stage 1 assessment suggested bald eagle observations peak during migration seasons; however, Stage 2 surveys showed that this species also overwinters and breeds within and near the Project and is likely to be observed at the Project throughout the year. During the first year of eagle use surveys bald eagles were observed in every season; however, only two eagle observations were recorded in each summer and winter. During the second year of eagle use surveys, more eagles were observed in winter (13 observations) than other seasons; no eagle observations were recorded in summer.

Recent nest survey guidance from USFWS indicates that most bald eagle movements should be expected to occur within two miles of occupied nests and any nests within this distance may potentially be impacted by a project (USFWS 2020). The nest within the current Project boundary is located 0.6 mi from the closest proposed turbine. Nest monitoring studies were conducted during spring and summer 2020 to further determine how and where the eagles moved around the nest. Data collected from late March until August shows eagle activity concentrated near the nest (Figure 10). Flight paths have been documented in the vicinity of four proposed turbines located southeast of the nest; however, upon review of aerial imagery, no prey resources appear to be located near these turbines. No other bald eagle nests are within two miles of proposed turbines.

No golden eagles were observed during site-specific surveys. Golden eagles may occur at the Project occasionally; however, the Project is expected to be low risk to golden eagles as described in the ECPG.

4.0 AVOIDANCE AND MINIMIZATION OF RISK USING CONSERVATION MEASURES AND COMPENSATORY MITIGATION

The following conservation measures will be or have been implemented by Big Bend Wind to avoid or minimize risk to eagles.

4.1 Project Layout and Design

Big Bend Wind adopted the following industry-standard best management practices (BMPs) to avoid, minimize, and reduce potential impacts to bald and golden eagles during the planning/design stage of the Project.

- The Project has been sited in disturbed agricultural lands away from major wildlife use areas that may attract eagles.
- The Project boundary was revised after the 2018 and 2019 aerial nest surveys in order to avoid nests 3251 and 3258 (Figure 9).

- The proposed turbine layout was revised after the 2020 aerial nest surveys in order to increase the distance between nest BAEA5 and the closest proposed turbine from 0.4 mi to 0.6 mi. In addition, four turbines that had been proposed to the north of the nest were removed from the layout (Figure 11).
- The number and length of roads, power lines, fences, and other infrastructure will be minimized to the extent practicable in an effort to reduce potential impacts to eagle habitat.
- Turbines will be sited as far away as practicable from any "natural" areas likely to have higher avian activity or diversity, as these areas may be attractive to eagles as well.
- Tubular towers will be used, which avoid providing perch locations for foraging eagles.
- Areas of disturbance have been minimized in an effort to reduce potential impacts to eagle habitat.
    - Infrastructure footprints associated with roads and other infrastructure have been minimized to the extent feasible.
    - Area disturbed by pre-construction monitoring and testing activities were minimized to the extent feasible.
    - The length and number of access roads were minimized and existing roads were used when feasible.
- The electrical collection system will be placed underground. This measure will eliminate collision risk and electrocution hazards for birds using the Project area and allows habitat to regenerate.
- The length of the 161kV aboveground transmission line necessary to connect the Project to the regional grid will be minimized to the extent practicable.
- The Project's above-ground transmission power lines from the Project substation to the interconnection substation shall be designed and constructed to minimize avian collision risks, referencing guidelines outlined in the APLIC's *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012), respectively.

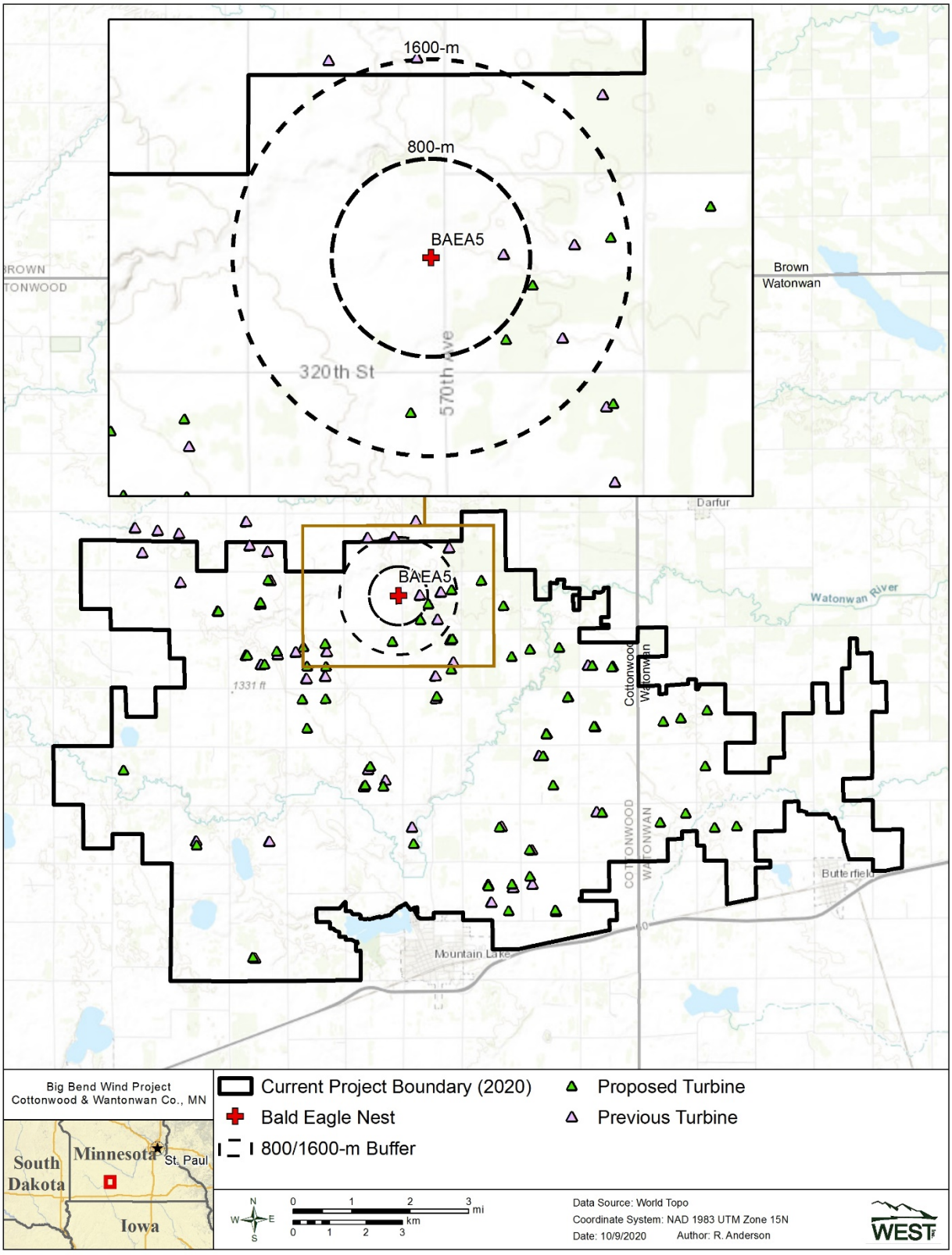

Figure 11. Previous and current proposed turbine layouts at the proposed Big Bend Wind Project in Cottonwood and Watonwan counties, Minnesota.

4.2 Construction

Big Bend Wind will employ industry-standard BMPs to reduce potential impacts to wildlife, including eagles, during the construction stage of the Project.

- All employees and contractors working on the site will receive worker awareness training for identifying and responding to encounters with sensitive biological resources, including bald and golden eagles. Training will include:
    - Reducing the potential for vehicle collision by adhering to posted speed limits, being alert for wildlife, and using additional caution in low visibility conditions to avoid collisions with wildlife that may create carrion along roads.
    - Avoiding harassing or disturbing eagles, particularly during reproductive seasons.
    - Keeping any dogs on site on leashes to avoid the potential for unleashed dogs to harass eagles within the Project.
    - Storing food-related trash and waste in containers and remove on a regular basis to reduce attractiveness of the Project to avian scavengers and their prey.
    - Reviewing the Wildlife Incident Reporting System (WIRS) so the construction team understands the procedures for recording eagle species found in the Project.

4.3 Operations

Big Bend Wind intends to adopt industry-standard BMPs to reduce potential impacts to eagles during the operational stage of the Project.

- Wildlife carrion and livestock carcasses in proximity to the turbines will be reported for removal, as practicable. In addition to attracting eagles to the Project, carrion can distract eagles while they fly, making them more susceptible to turbine collision. This measure reduces the risk to scavenging eagles.
- All employees and contractors working on the site will receive worker awareness training for identifying and responding to encounters with sensitive biological resources, including bald and golden eagles. Training will include:
    - Reducing the potential for impacts to eagles and their prey (e.g., adhering to posted speed limits, managing food-related trash and waste appropriately).
    - Identification of bald and golden eagles so this information can be relayed to the appropriate entity in a timely manner and operational adjustments implemented if appropriate.
    - Reviewing the WIRS so the operations team understands the procedures for recording eagle species found in the Project.

5.0 ASSESSING EAGLE RISK AND PREDICTING FATALITIES

5.1 Qualitative Risk Assessment

The bald eagle population has continued to increase since the species was removed from the threatened and endangered species list in 2007; however, bald eagles are still susceptible to a number of different anthropogenic factors. A study summarizing the cause of bald eagle fatalities between 1982 and 2013 found that the majority of fatalities were the result of poisoning (25.6%, primarily lead-poisoning) or trauma (22.9% of 2,980 fatalities, Russell and Franson 2014). Other causes of death were electrocution, shooting, emaciation, disease, trapping, drowning, and undetermined. In another study, 199 bald eagle fatalities were reported due to vehicle collision between 2006 and 2011 (Allison 2012). As of 2018, USFWS reported 55 confirmed bald eagle fatalities associated with wind turbines, three of which occurred in Minnesota (USFWS 2018).

According to the Environmental Review of Energy Projects data available for wind turbines on the Minnesota Department of Commerce electronic dockets website, eagle risk minutes per survey hour at the Project fall within the lower end of the range of several proposed and permitted wind energy projects in Minnesota (Minnesota Department of Commerce 2020). Over two years of eagle use surveys at the Project, 0.11 eagle risk minutes per survey hour were recorded. The proposed Walleye Wind Project, located in Rock County, reported 0.03 eagle risk minutes per survey hour in the first year of eagle use studies (Walleye Wind, LLC 2020). The proposed Plum Creek Wind Energy Project; located in Cottonwood, Redwood, and Murray counties to the northwest of the Project; reported 0.16 eagle risk minutes per survey hour during the first year of avian use studies (Plum Creek Wind Farm, LLC 2019). The proposed Buffalo Ridge Project, located in Lincoln and Pipestone counties, also documented 0.16 eagle risk minutes per survey hour during the first year of avian use surveys (Buffalo Ridge Wind, LLC 2019), and the proposed Three Waters Wind Farm in Jackson County reported an average of 0.16 eagle risk minutes per survey hour over two years of surveys (Three Waters Wind Farm, LLC 2020). The Blazing Star 2 Wind Project, located in Lincoln County, was permitted in 2019 and documented 0.38 eagle risk minutes per survey hour over two years of eagle use studies (Blazing Star II Wind Farm, LLC 2017).

Quantitative predictions of collision risk are based on the assumption that pre-construction use determines post-construction collision mortality (USFWS 2013, New et al. 2015). The Bayesian collision risk modeling framework presented by the USFWS to predict risk to eagles at wind projects uses a statistical model that incorporates prior information and site-specific survey data to predict the number of eagle fatalities resulting from collision with turbines. This model was developed using golden eagle use fatality data collected at four wind facilities in California and Wyoming. However, there is limited information supporting this assumption for bald eagles and other risk factors have been hypothesized to affect eagle risk (USFWS 2013). These factors include the interaction of topographic features, season, and wind currents to create favorable conditions for high-risk flight behavior near turbines (de Lucas et al. 2008) or behavior that distracts eagles from nearby turbines (e.g., active foraging or interactions with other birds). Additionally, the presence of turbines on the landscape may also alter eagle use, confounding the relationship between pre-construction eagle abundance and collision risk. Based on Stage 1 and

Stage 2 data, risk to golden eagles is expected to be low; therefore, this section focuses on bald eagles.

On June 21, 2018, USFWS provided *Updated Collision Risk Model Priors for Estimating Eagle Fatalities at Wind Energy Facilities* (83 FR 120: 28858-28860). The updated model incorporates species-specific priors for bald and golden eagles (New et al. 2018). Collision data for bald eagles was compiled from 13 wind energy facilities and the updated collision prior is higher than the ECPG model; exposure data for bald eagles was compiled from 59 wind energy facilities and the updated exposure prior is lower than the ECPG model. The higher collision risk in the bald eagle-specific model was explained by more variation between sites, and therefore, higher uncertainty. The USFWS noted that these priors, while species-specific, may not be representative of all locations. Since the updated model was released for public comment in 2018, the USFWS has not yet released any final updated collision risk priors for official use in the eagle permitting process.

5.1.1 Topography and Wind

The Project lacks ridgeline characteristics that might be used by eagles for consistent orographic (terrain-generated) lift (see Figure 3). Resident bald eagles may travel and hunt along the Watonwan River, which runs through the Project. In addition, eagles may hunt at several small lakes within the Project. During baseline surveys, the points with highest eagle use were located along the Watonwan River; however, eagle use was not documented at every point located along the river (Figures 7 and 8). These waterbodies are relatively small and are not expected to concentrate particularly high levels of bald eagle use within the Project but may serve as a travel corridor.

5.1.2 Active Foraging

Eagles actively hunting may be less vigilant to spinning turbine blades than eagles generally flying or soaring (Barrios and Rodriquez 2004). The Watonwan River runs through the middle of the Project and provides some foraging habitat for eagles. Based on the number of nests near the Project, it is likely additional foraging resources exist within the Project. These may include gamebirds, small mammals, and hog confinements.

5.1.3 Inter- and Intra-specific Interactions

Assuming inter- or intra-specific competition and territorial defense increase collision risk, there is some potential for these behaviors to occur among bald eagles or other species. Historically, bald eagles are known to occur in Minnesota during all seasons, but generally at higher numbers from late fall through early spring. Bald eagles also breed in the region. Data collected at the Project indicates the presence of adult bald eagles in the area throughout the year. In the three years of aerial nest surveys, new bald eagle nests were documented each year. In 2020, one bald eagle nest was documented within the Project boundary. The potential for increased territorial defense behaviors that could distract eagles near the nest, making them less vigilant of nearby turbines, exists at this Project. Nest defense behavior is most likely within two mi of an occupied nest (USFWS 2020).

5.1.4 Turbine-induced Changes to Eagle Use Patterns

Specific studies of bald eagle use, flight paths, and nesting before and after construction of wind facilities suggest bald eagles may detect and avoid operating wind turbines to a degree (Garvin et al. 2010, Ferrer et al. 2011), actively minimizing their use near operating wind energy facilities. At the Forward Wind Energy Center in Wisconsin, pre-construction bald eagle use observed during point counts was 0.004 bald eagle/plot/20-min survey. Bald eagle use declined in the first year after construction (0.001) and no bald eagles were observed during point counts two years following construction (Garvin and Drake 2011). At the Pillar Mountain project in Alaska, bald eagle use was similar between pre- and post-construction surveys; however, bald eagle flights did not occur over the ridge where three wind turbines were constructed, despite flights over the ridge commonly recorded prior to construction of the turbines (Sharp et al. 2011). Bald eagles were observed crossing the ridge two years after construction, but only flew between turbines when those turbines were not rotating (Sharp et al. 2011). No bald eagle mortalities were observed at either the Forward facility or the Pillar Mountain facility; however, it is unknown whether formal post-construction mortality monitoring occurred at Pillar Mountain (Grodsky and Drake 2011, Sharp et al. 2011). During construction of the Erie Shores facility in Ontario, Canada, a bald eagle pair that had historically nested within 400 m (1,312 ft) of a turbine location moved to a nest that was 900 m (2,953 ft) from the turbine (James 2008). One confirmed mortality has been documented at the Erie Shores facility; however, it is unknown if this mortality is associated with the known bald eagle nest (Van Fleet 2011). Although the available information is not conclusive, it suggests bald eagles may reduce their use and activities near operating wind turbines.

5.1.5 Nesting

During each year of pre-construction aerial raptor nest surveys, new bald eagle nests were documented within the surveyed areas. One nest detected during the 2020 survey is located 0.6 mi from a proposed turbine location. It is possible bald eagles will build additional nests within or near the Project in the future, despite the lack of major waterbodies that compose traditional nesting habitat. In southwestern Minnesota, bald eagle nest density has increased in the last decade (Foo et al. 2020). Typically thought to nest along fish-bearing waters, bald eagles are now frequently documented nesting in landscapes dominated by agriculture (Foo et al. 2020).

Based on studies included in the *Final Environmental Impact Statement on MidAmerican Energy Company's Habitat Conservation Plan for Midwestern Bat and Bird Species in Iowa*, operating turbines appear to have reduced eagle activity compared to reference areas without turbines (USFWS 2019). Four turbines are proposed within one mile of Nest BAEA5 (Figure 10). Nest monitoring surveys conducted to date indicate flight paths occur in low to medium concentrations near proposed turbine locations (Foo and Bailey 2020). Eagle activity is expected to further decrease in this area once the turbines are operational (USFWS 2019). Big Bend Wind's avoidance and minimization measures described in Section 4 will aid in minimizing risk to these nesting eagles, particularly by minimizing roadkill and carcasses that nesting eagles may scavenge.

5.2 Post-Construction Monitoring

Big Bend Wind will conduct post-construction bird and bat monitoring as described in the Bird and Bat Conservation Strategy and/or as issued through permit conditions through the Large Wind Energy Conversion Systems (LWECS) permit process. It is anticipated that the post-construction monitoring design requirements will be similar or Big Bend Wind will continue to consult with the USFWS to incorporate avoidance and minimization measures and post-construction monitoring measures that will effectively address potential risk to eagles.

Regardless of the implemented post-construction monitoring survey protocols, the following responses will be implemented if a wounded or dead eagle is found within the Project boundary:

- Notification of the USFWS no later than 48 hours, or as soon as possible thereafter in the event of unique circumstances that would prevent such immediate contact.
- An initial onsite investigation and/or photo documentation of the circumstances under which the event occurred;
- Coordination with the USFWS to document the details collected at the time of discovery; and
- Consultation on any additional avoidance measures that may be recommended for implementation which may include applying for an eagle incidental programmatic take permit or nest removal permit (if and where appropriate).

6.0 BALD AND GOLDEN EAGLE PROTECTION ACT (BGEPA) PERMITTING

BGEPA prohibits the unauthorized “take” of bald and golden eagles unless authorized by federal regulation. BGEPA authorizes the Secretary of the Interior to permit the take of bald or golden eagles for several defined purposes, including when “necessary to permit the taking of such eagles for the protection of wildlife or of agricultural or other interests in any particular locality.” The USFWS administers BGEPA.

6.1 Eagle Permit Rule Evolution

The USFWS published a final rule (Eagle Permit Rule) on September 11, 2009, under BGEPA authorizing issuance of an eagle incidental take permit (EITP) to take bald and golden eagles. An EITP can authorize the take of bald and golden eagles where the take is: (1) compatible with the preservation of the bald eagle and the golden eagle; (2) necessary to protect an interest in a particular locality; (3) associated with but not the purpose of the activity; and (4) for individual incidences of take, the take cannot be practicably avoided, and for programmatic take, the take is unavoidable even though advanced conservation practices are being implemented.

On December 9, 2013, the USFWS revised the Eagle Permit Rule and modified the legal standards for obtaining and operating under an EITP. The revised regulations referred to as the “Tenure Rule” extended the allowable duration of Eagle Take Permits from five years to up to 30 years. In addition the Tenure Rule established or refined requirements for review of each permit every five years, transparency and reporting, mitigation and advance conservation practices,

post-construction monitoring requirements, a new EITP application/administration fee schedule, different standards for "low risk projects," and expanded EITP transfer rules.

The Eagle Permit Rule was revised again on December 16, 2016. Revisions included changes to EITP issuance criteria and duration, definitions, compensatory mitigation standards, criteria for eagle nest removal permits, permit application requirements, and fees.

6.2 USFWS Eagle Take Guidance

The USFWS published the ECPG in 2013, which explains the agency's approach to issuing eagle take permits under the Eagle Permit Rule and provides guidance to permit applicants. The ECPG supplements the WEGs (2012 Guidelines). While the 2012 Guidelines provide a broad overview of wildlife considerations at wind energy facilities, the ECPG provides guidance specifically related to bald and golden eagles. Of note, two years of baseline eagle surveys have been completed at the Project consistent with the ECPG.

6.3 Permits Available Under BGEPA

Federal law does not require wind project owners or operators to pursue either EITPs (under 50 C.F.R. § 22.26) or eagle nest take permits (under 50 C.F.R. § 22.27). Rather, both types of permits are potentially available for the owner / operator of a wind farm to pursue and obtain voluntarily. As of August 2020, short-term permits (5 years or fewer) have a $2,500 application processing fee for commercial entities. For long-term permits (over 5 years), the application processing fee is $36,000. Long-term permittees are also charged an administration fee of $8,000 for each five-year period the permit is in effect. There is a $1,000 fee to transfer a permit to a new project owner.

7.0 REFERENCES

7.1 Literature Cited

Allison, T. D. 2012. Eagles and Wind Energy: Identifying Research Priorities. American Wind Wildlife Institute, Washington, D.C. May 2012.

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Public Interest Energy Research Program (PIER) Final Project Report CEC-500-2006-022. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D. C. and Sacramento, California. Available online: https://www.nrc.gov/docs/ML1224/ML12243A391.pdf

Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC, Washington, D. C.

Bailey, K., C. Foo, and C. LeBeau. 2020. Draft Year 2 Avian Use Study for the Proposed Big Bend Wind Project, Cottonwood County, Minnesota. Draft Report: November 6, 2018 – February 19, 2020. Prepared for Big Bend Wind, LLC, Charlottesville, Virginia. Prepared by Western EcoSystems Technology, Inc. (WEST), Laramie, Wyoming. April 17, 2020.

Barrios, L. and A. Rodríguez. 2004. Behavioural and Environmental Correlates of Soaring-Bird Mortality at on-Shore Wind Turbines. Journal of Applied Ecology 41: 72-81.

Blazing Star II Wind Farm, LLC. 2017. Blazing Star II Wind Farm: Avian and Bat Protection Plan. Blazing Star II Wind Farm Site Permit Application, Appendix G. Available online: https://mn.gov/eera/web/project-file?legacyPath=/opt/documents/34757/Appendix%20G%20Avian%20and%20Bat%20Protection%20Plan.pdf

Buffalo Ridge Wind, LLC. 2019. Wildlife Conservation Strategy Buffalo Ridge Wind Energy Project. Buffalo Ridge Wind Project Site Permit Application, Appendix H. Available online: https://mn.gov/eera/web/project-file/11184/

Cornell University. 2019. All About Birds: Golden Eagle. Accessed August 27, 2020. Available online: https://www.allaboutbirds.org/guide/Golden_Eagle

de Lucas, M., G. F. E. Janss, D. P. Whitfield, and M. Ferrer. 2008. Collision Fatality of Raptors in Wind Farms Does Not Depend on Raptor Abundance. Journal of Applied Ecology 45: 1695-1703. doi: 10.1111/j.1365-2664.2008.01549.x.

eBird. 2020. eBird: An Online Database of Bird Distribution and Abundance. eBird, Cornell Lab of Ornithology, Ithaca, New York. Accessed May 25, 2020. Information online: http://ebird.org/content/ebird/

Energy and Wildlife Action Coalition, Plaintiff, v. U.S. Department of the Interior; David Bernhardt, U.S. Secretary of the Interior; U.S. Fish and Wildlife Service; and Margaret E. Everson, Principal Deputy Director Exercising the Authority of the Director of the U.S. Fish and Wildlife Service Defendants. 2019. US District Court for the District of Columbia. Case 1:15-cv-01486-ABJ, Document 40. Filed October 16, 2019.

Esri. 2019, 2020. World Imagery and Aerial Photos. (World Topo). ArcGIS Resource Center. Environmental Systems Research Institute (Esri), producers of ArcGIS software. Redlands, California. Information online: https://www.arcgis.com/home/item.html?id=10df2279f9684e4a9f6a7f08febac2a9

Ferrer, M., M. de Lucas, G. F. E. Janss, E. Casado, A. R. Munoz, M. J. Bechard, and C. P. Calabuig. 2011. Weak Relationship between Risk Assessment Studies and Recorded Mortality in Wind Farms. Journal of Applied Ecology: doi: 10.1111/j.1365-2664.2011.02054.x.

Foo, C. and C. LeBeau. 2019. Eagle Nest Surveys for the Big Bend Wind Project Cottonwood County, Minnesota. Prepared by Western EcoSystems Technology, Inc. (WEST), Laramie, Wyoming. November 5, 2019.

Foo, C., L. Bishop-Boros, and C. Lebeau. 2019. Avian Use Surveys for the Proposed Big Bend Wind Project, Cottonwood County, Minnesota. Final Report. November 2017 - October 2018. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. June 7, 2019.

Foo, C., J. Stucker, and L. TeWinkel. 2020. Recovery Continues: Changes in Minnesota Bald Eagle Nesting Distribution and Density Since 2005. Presented at the Wildlife Society, Minnesota Chapter: Annual Meeting. February 20, 2020, Willmar, Minnesota.

Foo, C., and K. Bailey. 2020. Bald Eagle Nest Monitoring Surveys for the Proposed Big Bend Wind Project, Cottonwood and Watonwan Counties, Minnesota. Draft Report. Prepared for Big Bend Wind, LLC. Prepared by Western EcoSystems Technology, Inc. (WEST), Golden Valley, Minnesota. September 17, 2020. 9 pp. + appendix.

Garvin, J. C., C. S. Jannelle, D. Drake, and S. M. Grodsky. 2010. Response of Raptors to a Windfarm. Journal of Applied Ecology 48(1): 199-209 pp. doi: 10.1111/j.1365-2664.2010.01912.x. Available online: https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2664.2010.01912.x

Garvin, J. C. and D. Drake. 2011. Assessing Post-Construction Avian Use at the Forward Energy Center. Final Report. Public Service Commission (PSC) of Wisconsin. PSC REF#:152050. Prepared for Forward Energy LLC. Prepared by Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, Madison, Wisconsin. August 2011.

Grodsky, S. M. and D. Drake. 2011. Assessing Bird and Bat Mortality at the Forward Energy Center. Final Report. Public Service Commission (PSC) of Wisconsin. PSC REF#:152052. Prepared for Forward Energy LLC. Prepared by Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, Madison, Wisconsin. August 2011.

Hawk Migration Association of North America (HMANA). 2020. Bethany Hawkwatch. HawkWatch Site Profiles and Hawk Count Summaries for Mankato, Minnesota. Accessed May 25, 2020. Information online: http://www.hawkcount.org/siteinfo.php?tab=inv_t&rsite=704&dyearsel=2019

James, R. D. 2008. Wind Turbines and Birds - the Erie Shores Wind Farm Experience: Nesting Birds. Ontario Birds 26(2): 119-126.

Janos, G. 2020. 2020 Raptor Nest Survey Report for the Proposed Big Bend Wind Project, Cottonwood and Watonwan Counties, Minnesota. Prepared by Copperhead Environmental Consulting, Inc., Paint Lick, Kentucky. May 12, 2020.

LeBeau, C. and C. Foo. 2018a. Raptor Nest Surveys for the Big Bend Wind Project, Cottonwood, Watonwan, and Martin Counties, Minnesota. Prepared for Big Bend, LLC, Prepared by Western EcoSystems Technology, Inc. (WEST). August 14, 2018. Laramie, Wyoming.

LeBeau, C. and C. Foo. 2018b. Eagle Nest Monitoring Surveys for the Big Bend Wind Project in Cottonwood, Watonwan, and Martin Counties, Minnesota. Final Report. Prepared for Big Bend Wind Project. Prepared by Western EcoSystems Technology, Inc. (WEST), Laramie, Wyoming. October 25, 2018.

Minnesota Department of Commerce. 2020. Environmental Review of Energy Projects – Wind Turbines. Accessed on July 15, 2020. Available online: https://mn.gov/commerce/energyfacilities/

Minnesota Department of Natural Resources (MNDNR). 2006. 2005 Minnesota Bald Eagle Surveys. Available online: https://files.dnr.state.mn.us/eco/nongame/projects/eagle_report_2005.pdf

National Audubon Society. 2020. Audubon Christmas Bird Count. Accessed 6/11/2020. Available online: https://netapp.audubon.org/CBCObservation/

National Land Cover Database (NLCD). 2016. *As cited* includes:

Yang, L., S. Jin, P. Danielson, C. Homer, L. Gass, S. M. Bender, A. Case, C. Costello, J. Dewitz, J. Fry, M. Funk, B. Granneman, G. C. Liknes, M. Rigge, and G. Xian. 2018. A New Generation of the United States National Land Cover Database: Requirements, Research Priorities, Design, and Implementation Strategies. ISPRS Journal of Photogrammetry and Remote Sensing 146: 108-123. doi: 10.1016/j.isprsjprs.2018.09.006.

and

Multi-Resolution Land Characteristics (MRLC). 2019. National Land Cover Database (NLCD) 2016. Multi-Resolution Land Characteristics (MRLC) Consortium. US Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center, MRLC Project, Sioux Falls, South Dakota. May 10, 2019. Information online: https://www.mrlc.gov/data

New, L., E. Bjerre, B. Millsap, M. C. Otto, and M. C. Runge. 2015. A Collision Risk Model to Predict Avian Fatalities at Wind Facilities: An Example Using Golden Eagles, *Aquila chrysaetos*. PLoS ONE 10(7): e0130978. doi: 10.1371/journal.pone.0130978.

New, L., J. Simonis, M. Otto, E. Bjerre, and B. Millsap. 2018. U.S. Fish and Wildlife Prior Analysis (Version 2). October 17, 2018. 9 pp. Available online: https://www.fws.gov/migratorybirds/pdf/management/crmpriorsreport2018.pdf

North American Datum (NAD). 1983. NAD83 Geodetic Datum.

Plum Creek Wind Farm, LLC. 2019. Plum Creek Wind Project: Avian and Bat Protection Plan. Plum Creek Wind Farm Site Permit Application, Appendix G. Available online: https://mn.gov/eera/web/project-file/11352/

Postupalsky, S. 1974. Raptor Reproductive Success: Some Problems with Methods, Criteria, and Terminology. Pp. 21-31. In: F. N. Hamerstrom, Jr., B. E. Harrell, and R. R. Olendorff, eds. Management of Raptors: Proceedings of the Conference on Raptor Conservation Techniques, Fort Collins, Colorado, March 22-24, 1973. Raptor Research Foundation, Vermillion, South Dakota.

Reynolds, R. T., J. M. Scott, and R. A. Nussbaum. 1980. A Variable Circular-Plot Method for Estimating Bird Numbers. Condor 82(3): 309-313.

Russell, R. E. and J. C. Franson. 2014. Causes of Mortality in Eagles Submitted to The National Wildlife Health Center 1975-2013. Wildlife Society Bulletin, December 2014.

Sharp, L., C. Herrmann, R. Friedel, and K. Kosciuch. 2011. Pre- and Post-Construction Monitoring of Bald Eagle Use at the Pillar Mountain Wind Project, Kodiak, Alaska, 2007-2011. NWCC/AWWI Webinar. October 31, 2011. Available online: https://www.nationalwind.org/wp-content/uploads/assets/webinars/Research_Webinar_Lynn_Sharp__10-31-11_.pdf

Three Waters Wind Farm, LLC. 2020. Three Waters Wind Farm Site Permit Application, Appendix I, Part 2. Available online: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={8094876D-0000-C1BC-A107-5C9606AA0924}&documentTitle=20199-156209-06

US Environmental Protection Agency (USEPA). 2017. Level III and Level IV Ecoregions of the Continental United States. Ecosystems Research, USEPA. Last updated December 26, 2018. Accessed May 2020. Information online: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states

US Fish and Wildlife Service (USFWS). 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online: http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf

US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. 103 pp. + frontmatter. Available online: https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf

US Fish and Wildlife Service (USFWS). 2016a. Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update. Division of Migratory Bird Management, Washington D.C., USA.

US Fish and Wildlife Service (USFWS). 2016b. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests; Final Rule. 50 CFR 13 and 22. Department of the Interior Fish and Wildlife Service. 81 Federal Register (FR) 242: 91494-91554. December 16, 2016.

US Fish and Wildlife Service (USFWS). 2018. Bald Eagle Mortalities and Injuries at Wind Energy Facilities in the United States. Poster. The Wildlife Society 25th Annual Conference. October 7–11, 2018. Cleveland, Ohio. Information online: http://tws.conference.org/

US Fish and Wildlife Service (USFWS). 2019. Final Environmental Impact Statement for Proposed Habitat Conservation Plan and Incidental Take Permit, MidAmerican Energy Company Wind Energy Facility Portfolio, Iowa. Available online: https://fws.gov/midwest/rockisland/te/pdf/Final%20EIS%20for%20the%20MidAmerican%20Energy%20Company%20HCP%20and%20ITP.pdf

US Fish and Wildlife Service (USFWS). 2020. Updated Eagle Nest Survey Protocol. Memo to Regional Directors, Regions 1-12 from Assistant Director for Migratory Birds. April 21, 2020.

US Geological Survey (USGS). 2020. 3D Elevation Program (3DEP). 3D elevation data from light detection and ranging (lidar) data: conterminous United States, Hawaii, and the US territories. USGS, Reston, Virginia. Accessed May 2020. Information online: https://www.usgs.gov/core-science-systems/ngp/3dep

Van Fleet, K. 2011. Testimony at the Hearing on the Biological Ecological Impacts of the Proposed Offshore Wind Projects on Lake Erie. Joint Public Hearing on Off Shore Wind Energy, Tom Ridge Environmental Center, Erie, Pennsylvania. March 14, 2011.

Walleye Wind, LLC. 2020. Walleye Wind Project Site Permit Application, Appendix G. Available online: https://mn.gov/eera/web/project-file/11446/

7.2 Acts, Laws, and Regulations

50 Code of Federal Regulations (CFR) § 22.26. 2009. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits; Subpart C - Eagle Permits; Section (§) 22.26 - Permits for Eagle Take That Is Associated with, but Not the Purpose of, an Activity. 50 CFR 22.26. [74 FR 46877, September 11, 2009, as amended at 79 FR 73725, December 9, 2013].

81 Federal Register (FR) 242: 91494-91554. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests; Final Rule. Department of the Interior Fish and Wildlife Service. 81 FR 91494. December 16, 2016. Available online: https://www.gpo.gov/fdsys/pkg/FR-2016-12-16/pdf/2016-29908.pdf

83 Federal Register (FR) 120: 28858-28860. 2018. Updated Collision Risk Model Priors for Estimating Eagle Fatalities at Wind Energy Facilities; Notice of Availability and Request for Comments. Department of the Interior Fish and Wildlife Service. Department of Commerce National Oceanic and Atmospheric Administration. 83 FR 28858. June 21, 2018. Available online: https://www.fws.gov/policy/library/2018/2018-13358.html

84 Federal Register (FR) 53461: 53461-53462. 2019. Final Environmental Impact Statement on MidAmerican Energy Company's Habitat Conservation Plan for Midwestern Bat and Bird Species in Iowa. October 7, 2019. Available online: https://www.federalregister.gov/documents/2019/10/07/2019-21547/final-environmental-impact-statement-on-midamerican-energy-companys-habitat-conservation-plan-for