

TO: NextEra Energy Resources, LLC  
FROM: Tetra Tech, Inc  
DATE: 5/05/2016  
SUBJECT: Brady II Wind Energy Center –Spring (March 19-April 6) 2016 Avian Memo

## Introduction

Tetra Tech, Inc. was contracted by Brady Wind II, LLC, a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC (NextEra), to undertake spring point-count surveys for the proposed Brady II Wind Energy Center (Project) located in Hettinger and Stark counties, North Dakota. The studies were conducted to identify potential avian impacts associated with constructing and operating a wind energy facility. Birds have been identified as a group potentially at risk because of collisions with wind turbines and power lines, and displacement due to the presence of the associated structures. The spring point-count surveys are ongoing and scheduled to continue through early June 2016.

## Data Collection

The protocol for data collection at the Project was designed to be responsive to the level of effort recommended in the National Wind Coordinating Committee’s Comprehensive Guide to Studying Wind Energy/Wildlife Interactions (Strickland et al. 2011) and the voluntary U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (U.S. Fish and Wildlife Service [USFWS] 2012).

Weekly surveys were performed at the Project from March 19 through April 6, 2016, a date range that includes the initiation of spring migration season. Point-count surveys (Fixed 800-meter [m] radius) were conducted at 14 points distributed throughout the Study Area (Figure 1). The proposed turbine locations have recently been modified (dated April 22, 2016) and as a result, Survey Point 11 is no longer located in the current proposed Study Area (Figure 1). However, based on the habitat at the point and its proximity to the most up-to-date Study Area, Tetra Tech considers avian data collected at this point relevant to the dataset and has included in it this analysis.

An experienced field biologist (biologist) conducted 20-minute (min) point-count surveys collecting data on all birds detected within the point-count radius to evaluate avian use, behavior, and species richness. The point-count locations at Brady II were surveyed four times to capture the initiation of spring migration. Tetra Tech distributed the survey locations along publicly accessible roads and chose locations that maximized the 360-degree sight distance for the observer.

The survey protocol used in these studies is designed to collect data on all bird species and to provide results that are comparable with other studies at wind farms, rather than to target specific taxa. The benefit of using this protocol is that it estimates avian use throughout the day and captures activity by a variety of bird species. During the spring migration, songbirds are most active in the morning

and can be difficult to detect during the afternoon. In contrast, raptors become active as the sunlight heats the air and creates thermals, which individual raptors use for soaring. Thus, raptors are more readily detected several hours after sunrise. Therefore, this protocol is appropriate for characterizing the entire bird community. It should be noted, however, that this survey protocol can only detect nocturnal migrants should they be local breeders or if they utilize the Project as stopover habitat. Tetra Tech chose 20-min survey periods because they provide adequate time to detect both raptors and non-raptors. However, time periods of 20 minutes may lead to double-counting of songbirds (i.e., counting the same individual more than once) because individuals may appear and disappear from view. Double-counting of birds is not problematic for this type of survey because the objective is to document use in terms of number of birds noted per 20-min survey, not number of distinct individual birds.

Detectability varies among species and potentially not all individuals within the 800-m radius were counted. This variation in detectability could result in an overestimate of mean use for conspicuous species and an underestimate of mean use for reclusive species. Birds not easily identifiable, such as those seen under low light conditions or small birds seen at a distance were identified to the lowest taxonomic level possible. Hence, unidentified birds are included in the results.

## Results and Evaluation

A total of 860 birds from 19 species were observed during the spring avian point-counts (Table 1). Overall mean bird use within the Study Area was 15.36 birds/20 minute (min) and ranged from 0 to 63 birds per 20-min point-count survey. Non-raptor taxonomic groups with the highest mean use included songbirds and gamebirds (10.29 and 3.95 birds/20 min, respectively). The species with the highest mean use were the ring-necked pheasant (3.66 birds/20 min), horned lark (3.32 birds/20 min), red-winged blackbird (2.93 birds/20 min), and western meadowlark (1.05 birds/20 min). Other species had a mean use of less than 1.00 birds/20 min. Overall, ring-necked pheasant, a gamebird species, accounted for 23.8 percent of all birds observed and was observed in 44.6 percent of all surveys. The horned lark, the songbird species with the highest mean use, accounted for 21.6 percent of all birds observed and was observed in 39.3 percent of all surveys. Red-winged blackbird accounted for 19.1 percent of all birds observed and was observed in 16.1 percent of all surveys. Although each other species accounted for less than 7.0 percent of all birds observed, the western meadowlark was the most frequently observed species overall, with observations occurring in 55.4 percent of all surveys (Table 1).

Based on publically-available mortality data from regional windfarms, there is potential for turbine-related fatalities for ring-necked pheasant, horned lark, red-winged blackbird and western meadowlark in the Study Area. Ring-necked pheasants, however, are an introduced species and managed game bird, and are not protected under the Migratory Bird Treaty Act (MBTA). Additionally, potential fatalities of horned lark, red-winged blackbird and western meadowlark are not expected to have population-level impacts as a result of red-winged blackbirds and western meadowlarks having large populations in North Dakota (8.2 and 5.6 million respectively; PIFSC 2013) that are increasing (Sauer et al. 2014). Horned lark is experiencing some population decline in the badland and prairie region in which the Project area falls (Sauer et al. 2014), however the horned lark

population in North Dakota is also large (4.3 million; FIFSC 2013) and turbine-related mortality would likely be compensatory within the regional population.

High raptor use (greater than 2.0 birds/20 min) has been associated with high raptor mortality at wind facilities. Conversely, raptor mortality appears to be low when raptor use is low (less than 1.0 birds/20 min), which was the case within the Study Area (0.23 birds/20 min; Table 1) during the spring point-count surveys. Four raptor species, the northern harrier, American kestrel, red-tailed hawk and golden eagle were observed during the spring point-count surveys. Records of turbine-related fatalities exist for northern harrier, American kestrel and red-tailed hawk, however, based on the low rates of use in this study, fatalities of these species at the Project are expected to be uncommon. Furthermore, any fatalities at the Project are not expected to have population-level impacts for each of these species because North Dakota northern harrier, American kestrel and red-tailed hawk populations are robust and relatively stable (PIFSC 2013, Sauer et al. 2012).

One golden eagle was observed at Point 9 (Figure 1, Table 1) on a nest located in a wind break within the 800-m point-count circle at an estimated height of 6 m. This nest has been identified as golden eagle nest 2015\_39 which was determined to be occupied during the March 2016 aerial raptor nest surveys (Tetra Tech 2016a). No federally listed threatened or endangered species were detected during the spring 2016 point-count surveys. Sharp-tailed grouse and northern harriers are identified as Species of Conservation Priority in North Dakota's State Wildlife Action Plan (Wildlife Action Plan). Species covered by the Wildlife Action Plan are categorized into three levels according to their conservation need. Sharp-tailed grouse and northern harriers are considered Level II Species, which are those species having a moderate level of conservation priority or a high level of conservation priority but a substantial level of non-state wildlife grant funding is available to them. Sharp-tailed grouse have experienced population declines linked to landscape level land use changes, primarily due to habitat loss through the conversion of grasslands to cropland. State and federal wildlife agencies have regularly expressed concern about the locations of wind turbines with respect to prairie grouse leks (communal male displaying grounds). Two rounds of lek surveys were conducted in spring 2016 to identify all sharp-tailed grouse leks within the Study Area and 1-mile buffer (Tetra Tech 2016b). The northern harrier is fairly common in North Dakota. The northern harrier was designated as Species of Conservation Priority because up to ten percent of the harriers' population breeds in North Dakota. Grassland and wetland destruction and/or degradation are the primary factors limiting nesting habitat and food resources.

## Conclusions

The avian community detected within the Study Area during spring avian surveys was characterized by species typical of agricultural lands and remnant grasslands in North Dakota. Within disturbed habitats such as these, the greatest potential impact of wind facilities to avian species is risk of collisions with turbines rather than disturbance or displacement. Songbirds were identified as having potential risk of collision due to species within this group having relatively high mean use. The mean-use rate at the Project is primarily driven by observations of flocks and individuals of a common, resident species including the ring-necked pheasant, an introduced species not afforded protection under the MBTA.

An incubating golden eagle was observed during avian point-count surveys within the Study Area. The presence of a nesting eagle has implications for Project-related risk to golden eagles, both in terms of potential for collision and disturbance impacts. As such, NextEra is committed to ongoing and continued coordination with the USFWS and relevant state agencies.

Publically available regional fatality rates range from 0.38 and 11.83 birds/turbine/year (0.42 – 7.17 birds/MW/year). Annual avian fatality rates at the Project, should fatalities occur, are expected to fall within this range.

## Literature Cited

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## Figures and Tables

Figure 1

Vicinity Map



Brady II Wind Energy Center  
Stark and Hettinger counties, ND

- State Boundary
- County Boundary
- Urban area
- Interstate Highway
- Secondary Highway
- Secondary Road
- Study Area (2-23-16)
- River/Stream
- Lake/Pond

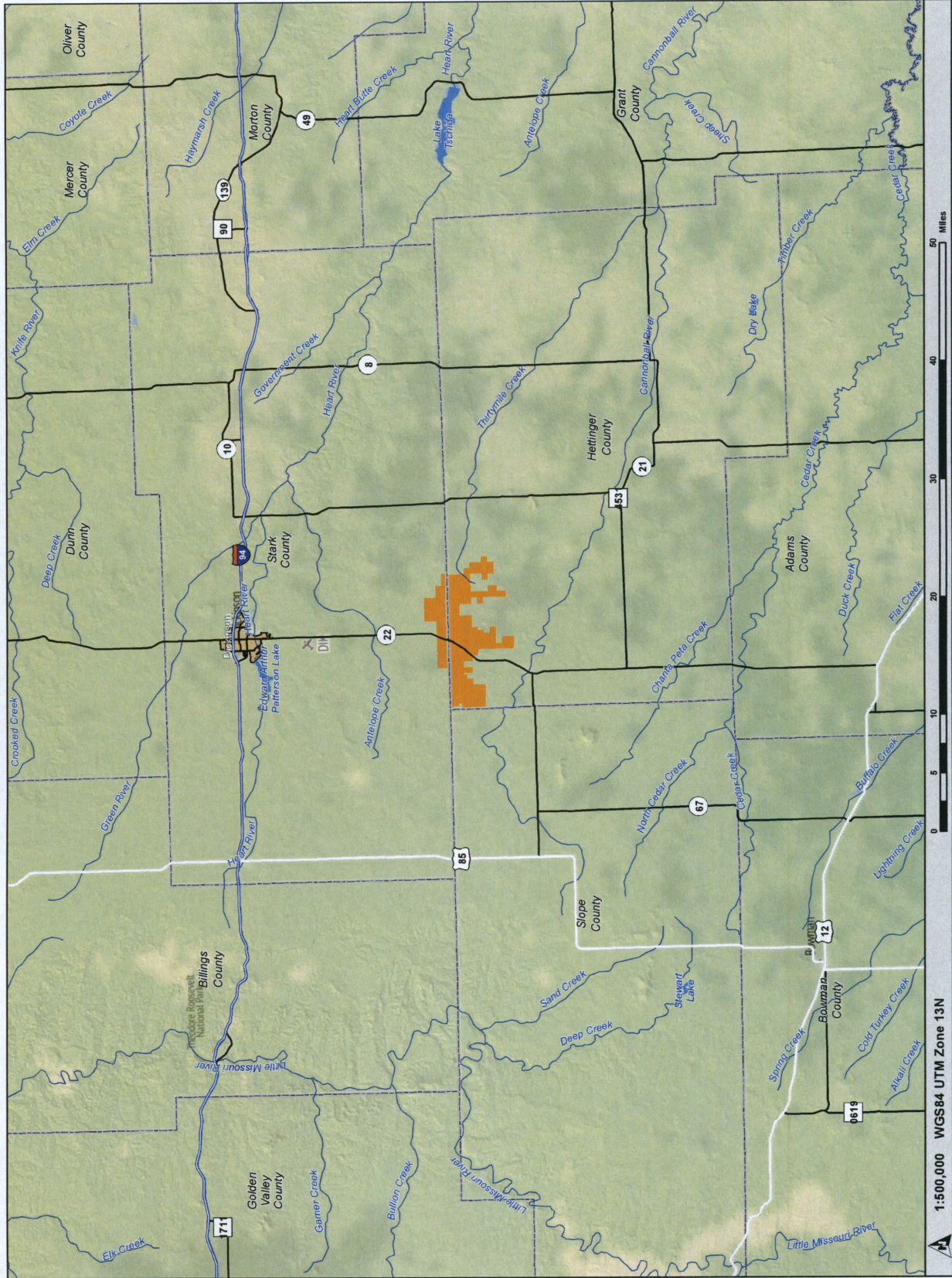




Table 1. Avian species, by species grouping, observed during the March 19 through April 6, 2016 point-count surveys at the Brady II Wind Farm.

Species Grouping	Overall Rank <sup>1</sup>	Number of Birds	Number of Observations	Mean Use # birds per 20 min. (90% confidence interval)	Frequency % of surveys detected	Percent Composition	
						Group	Overall
<b>Songbirds</b>							
horned lark	2	186	24	3.32 (2.45-4.19)	39.3	32.3%	21.6%
red-winged blackbird	3	164	10	2.93 (1.47-4.39)	16.1	28.5%	19.1%
western meadowlark	4	59	42	1.05 (1.05-1.05)	55.4	10.2%	6.9%
American crow	5	53	8	0.95 (0.70-1.20)	14.3	9.2%	6.2%
American robin	6	46	4	0.82 (0.82-0.82)	7.1	8.0%	5.3%
European starling	8	29	4	0.52 (0.26-0.78)	7.1	5.0%	3.4%
snow bunting	9	18	1	0.32 (0.00-0.85)	1.8	3.1%	2.1%
common grackle	11	12	1	0.21 (0.21-0.21)	1.8	2.1%	1.4%
American tree sparrow	13	9	2	0.16 (0.16-0.16)	1.8	1.6%	1.0%
<b>Group Total</b>		<b>576</b>	<b>96</b>	<b>10.29 (8.54-12.04)</b>	<b>17.9</b>		<b>67.0%</b>
<b>Gamebirds</b>							
ring-necked pheasant	1	205	26	3.66 (1.89-5.43)	44.6	92.8%	23.8%
sharp-tailed grouse	10	16	2	0.29 (0.00-0.67)	3.6	7.2%	1.9%
<b>Group Total</b>		<b>221</b>	<b>28</b>	<b>3.95 (2.15-5.75)</b>	<b>12.5</b>		<b>25.7%</b>
<b>Waterfowl</b>							
Canada goose	7	35	6	0.63 (0.63-0.63)	10.7	100.0%	4.1%
<b>Group Total</b>		<b>35</b>	<b>6</b>	<b>0.63 (0.63-0.63)</b>	<b>0.0</b>		<b>4.1%</b>
<b>Raptors</b>							
northern harrier	14	5	5	0.09 (0.09-0.09)	8.9	38.5%	0.6%
American kestrel	14	5	5	0.09 (0.06-0.12)	8.9	38.5%	0.6%
red-tailed hawk	17	2	2	0.04 (0.01-0.07)	3.6	15.4%	0.2%
golden eagle	18	1	1	0.02 (0.02-0.02)	1.8	7.7%	0.1%
<b>Group Total</b>		<b>13</b>	<b>13</b>	<b>0.23 (0.19-0.27)</b>	<b>3.6</b>		<b>1.5%</b>
<b>Pigeons/Doves</b>							
rock pigeon	12	10	2	0.18 (0.18-0.18)	1.8	100.0%	1.2%
<b>Group Total</b>		<b>10</b>	<b>2</b>	<b>0.18 (0.18-0.18)</b>	<b>0.0</b>		<b>1.2%</b>
<b>Gulls/Terns</b>							
ring-billed gull	16	4	1	0.07 (0.07-0.07)	1.8	100.0%	0.5%
<b>Group Total</b>		<b>4</b>	<b>1</b>	<b>0.07 (0.07-0.07)</b>	<b>0.0</b>		<b>0.5%</b>

**Table 1.** Avian species, by species grouping, observed during Spring 2016 point-count surveys at the BRADY II Wind Farm.

Species Grouping	Overall Rank <sup>1</sup>	Number of Birds	Number of Observations	Mean Use # birds per 20 min. (90% confidence interval)	Frequency % of surveys detected	Percent Composition	
						Group	Overall
<b>Waterbirds</b>							
killdeer	18	1	1	0.02 (0.02-0.02)	1.8	100.0%	0.1%
<b>Group Total</b>		<b>1</b>	<b>1</b>	<b>0.02 (0.02-0.02)</b>	<b>0.0</b>		<b>0.1%</b>
<b>Grand Total</b>		<b>860</b>	<b>147</b>	<b>15.36 (12.47-18.24)</b>			

<sup>1</sup> A ranking of 1 indicates highest mean use